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Submission / Observation

Proposed Lissinagroagh Wind Farm

Current Wind Farm Application: ACP-323048-25

Design Flexibility / 10-Year Permission: ACP-323910-25

Grid Connection: ACP-323353-25 - separate application but directly related

Planning Reference: PAX12.324290

Date: 7 July 2026

To: An Coimisiun Pleanala / An Bord Pleanala

Request: Refusal of Permission

Main Planning Application Number	**PAX12.324290**
Wind Farm Application Reference	**ACP-323048-25**
Grid Connection Reference	**ACP-323353-25**
Design Flexibility Option Reference	**ACP-323910-25**
Submitted by	Joseph Sheerin
Location	Kiltyclogher / Dough Mountain / Lough Melvin Catchment

Important: all related planning references are included above and repeated in the first paragraph and final refusal request, including the current wind farm application, the design flexibility / 10-year permission reference, and the separate grid connection reference.

This observation objects to the proposed wind farm because the site is unsuitable in principle due to upland blanket bog, peat instability risk, karst hydrology, steep slopes, high rainfall and sensitive watercourses connected to Lough Melvin SAC.

The objection also raises concerns regarding Hen Harrier and other protected species, Dough Mountain NHA, Kiltyclogher village, tourism, heritage, caving, public consultation, project splitting, the separate grid connection, the EirGrid Powering Up the North West route constraints, the former temporary 100 m mast application and current permanent mast proposal, and cumulative impact with Faughery Wind Farm.

Formal Objection

I wish to make a formal objection to the proposed Lissinagroagh Wind Farm, Main Planning Application Number PAX12.324290, including the associated Wind Farm Application Reference ACP-323048-25, Design Flexibility and 10-Year Permission Reference ACP-323910-25, and the separate Grid Connection Reference ACP-323353-25. Although the grid connection is being treated as a separate application, I submit that it is essential associated infrastructure and must be considered when assessing the overall environmental effects of the project.

I am involved locally in protecting Dough Mountain, the upland habitats, peatlands, protected wildlife, watercourses and the wider community of Kiltyclogher. I am also involved with Kiltyclogher Heritage Centre and with local heritage and environmental work in the area.

My objection is not based on minor concerns that could be resolved by planning conditions. My position is that Dough Mountain, Thur Mountain, Saddle Hill and the surrounding upland blanket bog, karst, forestry, watercourses, habitats, heritage features and community landscape are unsuitable in principle for a wind farm of this scale. I do not accept that reducing the number of turbines makes this development acceptable. Faughery Wind Farm has already caused major landscape and upland habitat change in this area, and further wind farm development would compound that impact.

The proposed development should be refused.

1. Overall Grounds of Objection

The proposed wind farm would place fourteen turbines of up to 185 metres tip height, together with new roads, borrow pits, compounds, drainage works and forestry clearance, on a sensitive upland landscape connected to Dough Mountain, Thur Mountain, Saddle Hill, Kiltyclogher, the Sraduffy River, the County River, the Lattone River and Lough Melvin SAC.

The application is fundamentally deficient because it separates the wind farm from the grid connection and from wider grid and turbine delivery impacts. The public is being asked to assess the main wind farm without full information on the grid route, connection works, cumulative impacts, turbine delivery route, road works, water risks, habitat loss and effects on households and communities along the full project.

The development would affect: upland blanket bog and peatland; karst hydrology, underground water, groundwater, springs, swallow holes, caves and hidden drainage pathways; the Lattone River, the County River, Dooard River SAC, Sraduffy River, Lough Melvin SAC, Owenmore River, Lough Gill SAC, Glenfarne River and Lough MacNean; Hen Harrier, Curlew, Ring Ouzel, raptors, bats, Marsh Fritillary, White-clawed Crayfish and other protected species; Dough Mountain NHA and the wider ecological network; Kiltyclogher village, tourism, heritage, walking, river walks, caving and community development; local farming, private water supplies, fisheries and downstream water quality; landscape, visual amenity, shadow flicker, noise and aviation safety; public participation, cross-border consultation and trust in the planning process.

The EIAR and NIS do not, in my view, provide the certainty required for a project of this scale in this location.

2. Project Splitting, Grid Connection and Incomplete Assessment

The main planning application is identified as PAX12.324290. The associated references include ACP-323048-25 for the wind farm application, ACP-323353-25 for the grid connection and ACP-323910-25 for the design flexibility option. These related references create serious difficulty for the public and for proper environmental assessment because the wind farm, grid connection and design flexibility option are being considered through separate processes rather than as one complete project.

A wind farm cannot operate without a grid connection. The grid connection is not a side issue; it is an essential part of the project. It may involve trenching, road opening, ducting, crossing watercourses, removing hedgerows, affecting households, disturbing habitats and creating cumulative impacts with the wind farm itself. It may also require wider grid upgrades, especially given information that the North West grid is nearing capacity.

The public was not clearly informed from the start that there would be separate applications. Householders along the grid route were not consulted in the same way as if the route had been presented as part of the complete project. The community is therefore being asked to pay separate fees and make separate submissions on what is, in practical reality, one connected project.

The EIAR scoping material referred to a 110 kV grid connection, but it did not appear to assess the full route, wider grid upgrades, all associated road works or all cumulative impacts. Comments from statutory bodies referring to Lough Gill appear to relate to pollution risks from the wind farm development footprint rather than a full grid route assessment.

This is a central weakness. The full project should be assessed together, including the wind farm, grid connection, turbine delivery route, road works, borrow pits, drainage, forestry clearance, construction compounds and cumulative effects with Faughery Wind Farm and other wind energy proposals in the wider area.

EirGrid Powering Up the North West - Route Constraints

I also rely on the EirGrid Powering Up the North West Project Overview, September 2025, Route Options, page 10. Source: https://cms.eirgrid.ie/sites/default/files/publications/Powering-Up-the-Northwest-Project-Overview-September-2025.pdf. In identifying constraints, EirGrid refers to physical constraints, landscape and visual constraints, cultural heritage constraints, and people and the environment. Under people and the environment, EirGrid states that it seeks to minimise or avoid impact to people and the environment through careful routing, and that it will avoid towns and villages and maximise the distance from houses and areas with environmental sensitivities, including woodlands and bogs.

This is important because it confirms that the grid route is not a minor matter for the wind farm developer alone. EirGrid is responsible for grid infrastructure and is still only at Stage 4 of a six-stage project. Negotiations with landowners have not been completed. The full route, landowner impacts, environmental constraints and final grid implications therefore remain unresolved while the public is being asked to assess the wind farm.

Most importantly, EirGrid itself identifies woodlands and bogs as environmental sensitivities to be avoided for grid routing. If EirGrid recognises that woodlands and bogs should be avoided for a grid route, it is not credible to treat the same type of sensitive upland woodland, bog, peat and water environment as

suitable for fourteen 185 metre turbines, extensive new roads, borrow pits, hardstands, drainage works and a permanent meteorological mast.

This strengthens my objection that the wind farm, grid connection, route options and design flexibility option must be assessed together. It also strengthens the argument that the proposal is unsuitable in principle, rather than merely requiring mitigation.

Grid Capacity, Export Route Uncertainty and Premature Application

I submit that one of the major flaws in this entire planning application is that the grid infrastructure required to carry the electricity from the proposed wind farm is not complete, not finally confirmed and not environmentally assessed as part of one complete project.

This is not a minor technical issue. It goes to the heart of whether the project is real, deliverable and properly assessed. A wind farm of this scale cannot operate without a secure and lawful grid connection. The electricity export route is therefore not optional infrastructure. It is an essential part of the development.

This concern is supported by Government, national, European, EirGrid, local and wind industry sources, all of which repeatedly identify grid capacity, grid reinforcement, curtailment and connection delays as major barriers to renewable-energy development. EirGrid's public material states that its Powering Up the North West programme is required to meet increased electricity demand and enable more renewable energy sources to connect to the grid in the region. EirGrid's September 2025 project overview also confirms the need to strengthen the electricity grid in the North West.

EirGrid also publishes renewable constraint and curtailment reports, confirming that wind and solar projects in Ireland are affected by grid constraints and curtailment. Academic analysis of the all-island electricity system also identifies that Ireland and Northern Ireland cannot always accommodate all available renewable generation because of operational and technical constraints, and that curtailment has increased as installed wind capacity has increased.

The wind industry itself recognises this problem. Wind Energy Ireland has referred to increasing curtailment and constraints on the grid, and to the need for electrification and flexible demand to relieve pressure. At European level, WindEurope has also identified grid connection delays as a significant barrier to wind farm development across Europe, including Ireland.

In that context, the proposed Lissinagroagh Wind Farm is premature. The application is asking An Bord Pleanala to approve fourteen 185 m turbines on Dough Mountain before the full electricity export route and wider grid reinforcement position have been completed, fixed and assessed. This is an unsuitable way to assess a project of this scale.

The developer cannot rely on the general national need for renewable energy while failing to provide a complete, route-specific and environmentally assessed grid solution. If the national and regional grid is already constrained, and if the North West requires major reinforcement, then the Board cannot safely assess this wind farm in isolation from the grid works needed to make it function.

This is especially serious because Dough Mountain is an unsuitable location in principle. It is an upland peat, forestry, hydrology, karst, habitat, landscape and community-sensitive area. It is near protected water systems, rural settlements, small farms, tourism assets, heritage routes, wildlife areas and the setting of Kiltyclogher and surrounding communities. A project should not

be forced into such a sensitive landscape simply because the wind industry wants more generation capacity before the grid network is ready to receive it.

EirGrid's own routing principles are also important. EirGrid identifies constraints including physical constraints, landscape and visual constraints, cultural heritage, and people and the environment. It states that routing should seek to avoid towns and villages, maximise distance from houses, and avoid environmentally sensitive areas such as woodlands and bogs. That is directly relevant to this proposal. If EirGrid seeks to avoid towns, villages, houses, woodlands and bogs when routing electricity infrastructure, then the same woodlands and bogs should not be treated as suitable for fourteen 185 m turbines, a permanent 100 m mast, borrow pits, access roads, drainage works, construction compounds and cable trenches.

The public is therefore being asked to assess only part of the development. The wind farm is presented now, while the grid route, grid reinforcement, cumulative grid impacts, landowner impacts, route-specific ecological surveys, bird surveys, bat surveys, watercourse surveys, peat surveys, hydrology assessments, cultural heritage surveys and traffic impacts remain incomplete or outside the main EIAR.

That is not a complete environmental assessment. It is a fragmented assessment of a project that cannot operate without the missing infrastructure.

I therefore submit that the application is premature, incomplete and unreliable. Until the grid connection, wider grid reinforcement works and electricity export route are finally selected, surveyed, environmentally assessed and presented to the public as part of the complete project, the Board cannot safely conclude that the development will not have significant environmental effects.

The correct planning conclusion is that permission should be refused. The national grid problem cannot be solved by consenting an industrial wind farm in an unsuitable upland peat landscape before the grid needed to carry its electricity has been properly created, assessed and consented.

3. Hydrology, Karst and Water Quality

The proposed development is located in a sensitive upland water environment where surface water and underground water must be assessed together. The affected water system includes underground water, groundwater, karst pathways, springs, swallow holes, caves, hidden drainage pathways, the Lattone River, the County River, Dooard River SAC, Sraduffy River, Lough Melvin SAC, Owenmore River, Lough Gill SAC, Glenfarne River and Lough MacNean. These water systems support fisheries, protected habitats and downstream communities and cannot be treated as separate or secondary receptors.

The EIAR does not give adequate certainty regarding karst hydrology. Karst testing and dye tracing have not been carried out, despite local evidence of caves, swallow holes, fast-flowing underground water features and limestone bedrock. Where karst is present, pollution can travel quickly and unpredictably underground. Surface water monitoring alone may not detect contamination.

A cave and water feature have been identified in the Tullyskeherney area, close to heritage features. Water was observed flowing rapidly through the feature. Local concerns were raised at a multi-agency meeting in Kiltyclogher Heritage Centre in November 2019 regarding the tomb,

cave and water connection to Lough Melvin. These features show that the area cannot be treated as a simple surface-water catchment.

The former Faughery Wind Farm water monitoring records are relevant. They identified karst features including a swallow hole and spring, but did not establish full groundwater connectivity by dye tracing. The absence of detected pollution in limited monitoring does not prove that pollutants cannot travel through karst or peatland systems.

The proposed development would involve excavation, borrow pits, road construction, drainage, concrete works, fuel storage, machinery, forestry clearance and soil disturbance on steep upland ground. Any pollution, silt, concrete washout, hydrocarbons or peat disturbance could enter narrow water channels and travel downstream rapidly during heavy rainfall.

The area experiences intense rainfall and flash flooding. Local watercourses swell quickly. Climate conditions are changing, with heavier rainfall events, longer wet periods, storms and forestry windthrow already affecting rural Leitrim. These risks are not theoretical. The combination of steep slopes, peat, forestry, karst and heavy rainfall creates a high-risk water environment.

The EIAR should not be accepted where it relies on assumptions instead of direct proof of groundwater flow, dye tracing, full karst assessment and robust monitoring of all flow paths to Lough Melvin SAC and other sensitive waters.

3A. Fundamental Defect in the Soils, Geology and Hydrogeology Study Area - Failure to Assess the Full Receiving Environment

Tobin's scoping report states under Section 7.2 Study Area that the EIAR study area for soils, geology and hydrogeology will "primarily focus on the wind farm site." It then states that the assessment will also consider lands adjacent to the site boundary, downstream environs "to an appropriate extent," and proposed forestry replacement lands. I submit that this wording exposes a fundamental flaw in the environmental assessment from the outset. The assessment was scoped around the wind farm site first, with the surrounding and downstream environment treated as secondary. That is an inappropriate and unsafe approach for a large upland wind farm proposed on Dough Mountain, where the receiving environment is not confined to the red-line boundary of the application.

This is not a lowland industrial site where impacts can be assessed mainly within the footprint of the development. This is an upland mountain, peatland, forestry, karst and water-source environment. The development site sits above rivers, streams, groundwater pathways, springs, swallow holes, caves, protected habitats, protected species, fisheries, farms, homes, drinking-water interests and internationally important lakes. In such a landscape, the correct starting point is not the wind farm boundary. The correct starting point is the full environmental system that may be affected by the project.

Water, peat, sediment and pollution do not stop at a planning boundary. Any disturbance caused by turbine foundations, borrow pits, crane hardstandings, access roads, drainage works, forestry felling, peat excavation, concrete works, hydrocarbon storage, cable trenching or long-term operational drainage can move downhill and downstream. On Dough Mountain, these pathways

may include visible surface-water channels and invisible underground karst routes. Therefore, an assessment that “primarily focuses” on the wind farm site risks missing the very receptors most likely to suffer the consequences of the development.

The seriousness of this flaw is increased by the applicant’s own scoping material. The same report identifies karst features within the limestone bedrock formation in the study area, confirms the presence of blanket peat in the vicinity, identifies Dough/Thur Mountains NHA adjacent to the site, and identifies Lough Gill SAC, Lough Melvin SAC and Northern Ireland Lough Melvin SAC as nearby Natura 2000 receptors. It also records that GSI landslide susceptibility mapping identifies the central and northern parts of the study area as moderate to high in landslide susceptibility.

These are not minor background constraints. They are the central environmental issues in this application. Once karst, peat, landslide susceptibility, downstream rivers, SAC lakes and an adjacent upland NHA were known, the study area should have been defined by hydrological, geological and ecological pathways. It should not have been primarily defined by the wind farm site boundary.

The phrase “to an appropriate extent” is also inadequate. It does not explain what the applicant considers appropriate. It does not define the downstream limit of the assessment. It does not identify whether the assessment follows every relevant river and stream pathway from Dough Mountain. It does not show whether underground karst connectivity has been properly traced. It does not establish whether Lough Melvin SAC, Lough Gill SAC, cross-border waters, fisheries, drinking-water sources, springs, caves and swallow holes are assessed as primary receptors rather than peripheral matters.

This is a major weakness because Dough Mountain is a source area. The wind farm would not merely sit beside the receiving environment; it would sit above it. The mountain drains into wider catchments and protected water systems. The development would involve large-scale physical intervention at height, including turbine bases, new roads, borrow pits, compounds, drainage infrastructure and forestry operations. The environmental risk therefore travels outward from the site, downhill and downstream. A proper EIAR should follow that risk wherever it goes.

The scoping approach appears to reverse the correct environmental question. It appears to ask first: what is within the wind farm site and what adjacent or downstream lands should also be considered? The correct question should have been: what entire environment may be affected by constructing and operating this wind farm on Dough Mountain?

That wider question includes underground water, groundwater pathways, karst systems, springs, swallow holes and caves; the Lattone River, the County River, Dooard River SAC, Sraduffy River, Lough Melvin SAC, Owenmore River, Lough Gill SAC, Glenfarne River and Lough MacNean; drinking-water and agricultural water interests; peatland stability and peat movement; sediment release and siltation; hydrological changes caused by drainage, road-building and forestry felling; impacts on Dough/Thur Mountains NHA and connected peatland habitat; impacts on Hen Harrier, raptors, Marsh Fritillary, aquatic species and other protected wildlife; cumulative effects with Faughery Wind Farm and other wind-energy infrastructure; and cross-border effects on Lough Melvin and Northern Ireland waters.

In my submission, these matters cannot be treated as secondary to the wind farm site. They are the receiving environment. They are the environment that the EIAR is supposed to protect.

This flaw also affects the reliability of the applicant's conclusions. If the study area is too narrow, the baseline is incomplete. If the baseline is incomplete, the impact assessment is incomplete. If the impact assessment is incomplete, the mitigation cannot be relied upon. If mitigation is designed only around the development footprint, it may fail to protect downstream, underground, cross-border and ecological receptors.

This is particularly serious in a karst landscape. In karst, water can move rapidly and unpredictably through underground channels, fissures, swallow holes and springs. These pathways may not follow surface-water catchment boundaries. They may be rapid, unpredictable and invisible without proper testing. In a karst landscape, it is not enough to assume flow direction from maps or surface drainage.

This weakness is highlighted by the applicant's failure to complete proper dye testing and karst investigation before seeking planning permission. Tobin's scoping report already identified that a number of karst features had been identified within the limestone bedrock formation in the study area. Karst was therefore not an unknown or unexpected issue. It was known at scoping stage.

Once karst was identified, the applicant should have carried out full hydrogeological investigations, including dye tracing where necessary, before finalising the EIAR, NIS and mitigation proposals. It is wholly inadequate to leave essential karst testing, dye tracing or groundwater connectivity studies until after planning permission is granted. That approach reverses the purpose of environmental impact assessment. The purpose of the EIAR is to identify, assess and disclose the likely significant effects of the project before consent is given, so that the competent authority and the public can understand the real risks and evaluate whether the project should be permitted at all.

Dye tracing is essential because karst systems can transmit water, sediment and pollution through underground fissures, conduits, swallow holes, caves and springs. These pathways may not follow surface-water catchment boundaries. They may be rapid, unpredictable and invisible without proper testing. In a karst landscape, dye tracing may be the only practical way to establish actual underground connectivity between disturbance areas and receiving waters.

This is critical at Dough Mountain because the proposed development involves large-scale construction on an upland source area, including turbine foundations, borrow pits, access roads, crane hardstandings, drainage works, forestry felling, excavation, concrete pouring and hydrocarbon use. If underground karst pathways connect the site to rivers, springs, caves, Lough Melvin SAC, Lough Gill SAC or local water supplies, then the risk is not theoretical. It is a direct pathway for environmental harm.

The failure to complete dye testing before consent means the EIAR cannot reliably answer basic questions, including where groundwater from the turbine and borrow-pit areas actually flows; whether swallow holes, caves, springs and underground channels connect to protected waters; how quickly pollution or sediment could move through the system; whether local wells, springs, farms or drinking-water interests could be affected; whether Lough Melvin SAC, Lough Gill SAC or cross-border waters are connected through hidden pathways; and whether proposed mitigation can actually work in the real hydrogeological system.

Without that information, the applicant cannot safely conclude that there will be no significant effects on water, fisheries, protected habitats, protected species or European sites.

This also exposes the inadequacy of Section 7.2 of the scoping report. The study area was said to primarily focus on the wind farm site, with adjacent lands and downstream environs considered only “to an appropriate extent.” That approach is especially defective in a karst environment, because the true zone of influence cannot be defined by the red-line boundary or by visible surface drainage alone. It must be established through proper investigation of underground pathways before the EIAR is completed.

Leaving karst studies until after planning permission would unlawfully defer a central environmental assessment issue. It would allow the project to be consented first and understood later. That is not precautionary, not transparent, and not sufficient for a development of this scale in an upland peat and karst landscape draining toward protected waters.

This is not a matter that can be dealt with by a planning condition. A condition requiring later dye testing would not cure the defect, because the public, prescribed bodies and competent authority would already have been deprived of the information needed to assess the application. If later testing showed a serious underground connection to Lough Melvin, Lough Gill, springs, caves or drinking-water sources, the project design, turbine locations, borrow pits, roads, drainage and mitigation could all require fundamental reconsideration.

It is also particularly serious in an upland peat landscape. Peat stability, peat drainage and peat erosion are not confined to the exact location of a turbine base. Disturbance in one area can alter water movement, slope stability and sediment release over a wider area. Roads, drains, borrow pits, tree felling and construction traffic can change how water moves through peat and across slopes. On a mountain with moderate to high landslide susceptibility in parts of the study area, the assessment should have been precautionary, catchment-wide and slope-system based.

The applicant’s approach also risks under-assessing cumulative effects. Faughery Wind Farm is adjacent to the proposed Lissinagroagh development. The wider Dough Mountain area has already been altered by wind-energy development, forestry, roads and drainage. A study area primarily focused on the new wind farm site is not sufficient to assess cumulative impacts on peat, hydrology, birds, wildlife, landscape, water quality and downstream receptors.

I therefore submit that Section 7.2 reveals a serious scoping defect. The EIAR study area for soils, geology and hydrogeology should have been defined by the full zone of influence of the development, not primarily by the wind farm site. That zone of influence should include all surface-water, groundwater, peatland, karst, ecological and downstream pathways from the turbine locations, roads, borrow pits, compounds and felling areas to their final receiving environments.

The competent authority cannot be satisfied that the EIAR has properly assessed the likely significant effects of the project where the assessment has been framed too narrowly from the outset. The applicant has not demonstrated, with the necessary certainty, that the development will not significantly affect Lough Melvin SAC, Lough Gill SAC, Dough/Thur Mountains NHA, downstream rivers, drinking-water interests, fisheries, protected species, peat stability, karst groundwater or cross-border waters.

For these reasons, I submit that the soils, geology and hydrogeology assessment is fundamentally deficient. The flaw is not merely a missing detail that can be corrected by condition. It goes to the structure of the EIAR itself. The study area is too narrow, the wider receiving environment is treated as secondary, and the assessment does not properly follow the environmental pathways from Dough Mountain to the sensitive receptors at risk. On that basis, the application should be refused.

3B. Watercourses as Natural Connected Systems

I submit that the EIAR fails to properly treat the Dough Mountain watercourse system as a natural connected catchment. The SEPA guide Watercourses in the Community states that watercourses, drainage and flooding are natural systems which establish an equilibrium, and that human interference can cause increased runoff, flooding, erosion and downstream flooding. It also states that natural river systems should remain untouched wherever possible and, where interference is necessary, every effort should be made to maintain the natural balance.

This is directly relevant to Lissinagroagh. The proposed development would not merely place turbines on isolated points. It would introduce roads, foundations, hardstands, borrow pits, drainage systems, felling areas, cable trenches and watercourse crossings into an upland source area. These works would interfere with the natural movement of water from Dough Mountain through soils, peat, drains, streams, springs and watercourses.

The guide also states that action in one part of a river will cause a reaction elsewhere, and that a damaged stretch can endanger wildlife for many miles. This supports my submission that impacts from Dough Mountain cannot be confined to the red-line boundary. Any change to flow, sediment, erosion, drainage, peat movement or pollution can move downstream through North Leitrim and towards sensitive receiving waters including Lough Melvin SAC.

The EIAR should therefore assess the full natural catchment system and not simply rely on engineering controls, barriers or emergency response. The correct approach is to avoid damaging the natural watercourse system in the first place.

4. Peat, Geology, Landslide and Bog Movement Risk

The site includes upland blanket bog, peat, forestry on peat, steep slopes, water channels and sloping upland terrain. These are exactly the conditions where peat instability, bog movement, erosion, slippage and sediment release must be treated with extreme caution.

The Geological Survey Ireland classification of the area includes low to moderately high landslide susceptibility. The area also has a history of landslides, mapped faults, caves, borrow pits, peat cutting, steep terrain, high rainfall and low-permeability bedrock leading to a high water table.

The previous refusal of Croagh Wind Farm by An Bord Pleanala is relevant to the assessment of peat and landslide risk in upland wind farm development. The 2009 refusal history for this area is also highly relevant. It is not sufficient for the developer to treat the current application as if the past planning and environmental history can be ignored.

The proposed turbines, access roads and borrow pits would require major excavation and ground disturbance. There are concerns that the volume of material to be removed, moved or reused may be underestimated. The borrow pit sizes and the quantities of soil, peat, rock and spoil need to be independently examined.

Coillte AIE material is also important. Coillte indicated it had no official policy or criteria for bog or soil movement and no maps or reports of historic or current soil or ground movement, apart from limited meeting records. The absence of records is not proof of absence of risk. In a high-risk upland peat and karst environment, lack of records is a gap in assessment, not reassurance.

The EIAR appears to separate commercial forestry from the wider upland peatland and NHA system. This is not realistic. The hydrology of peat, forestry drains, blanket bog, exposed peat faces, watercourses and downstream habitats is connected. Dough Mountain NHA may not include every forestry block, but ecological and hydrological systems do not stop at mapped boundaries.

4A. An Bord Pleanala Croagh Wind Farm Refusal - Pointers that Apply to Lissinagroagh

I request that An Bord Pleanala apply the same core caution and refusal logic from the Croagh Wind Farm refusal to Lissinagroagh Wind Farm. The physical, peat, drainage, landslide, construction and landscape risks identified in the Croagh refusal are directly relevant to this site. In many respects, they are repeated or intensified at Dough Mountain, Thur Mountain, Saddle Hill and the surrounding upland bog and forestry landscape.

- Geological Survey Ireland classifies parts of the site and surrounding area as having low to moderately high landslide susceptibility.
- There is a high density of historical landslides in this upland area, including within or close to the proposed development lands.
- There are numerous mapped faults, caves, swallow holes, borrow pits and unmapped underground features within and around the Study Area.
- The terrain is upland, sloping and exposed, with Dough Mountain rising to approximately 460 m and overlooking the wind farm site and adjacent NHA upland bog.
- High rainfall levels are prevalent in this part of north Leitrim, increasing the risk of peat saturation, surface water pressure, erosion and bog movement.
- Upland blanket bog is the dominant soil type at the site and any biological impact on this natural resource must be assessed with extreme caution.
- The low permeability of the limestone bedrock and associated geology can contribute to a high water table and rapid movement of surface and underground water.
- There is a high density of water channels throughout the site, both natural and man-made, including steep gorges, flash flood channels and forestry drains.
- Timing construction outside the breeding season for birds may coincide with wetter periods, increasing peat, drainage, access, sediment and pollution risks.
- Large areas of forestry are to be clear-felled, leaving peat and subsoils exposed to rainfall, erosion, windthrow and slope instability.
- Extensive water crossings and crossing upgrades would be required across a sensitive upland drainage network.
- Deep peat occurs at turbine locations and along existing and proposed access roads, creating excavation, bearing capacity and long-term stability concerns.
- Significant volumes of peat and other material would require excavation, handling, storage and management on site.

- Instability may arise from movement and placement of waste material, including large volumes of waste peat and spoil on bogland and hilly terrain.
- Any proposed peat or spoil repositories, retaining buttresses or containment structures must be treated as major engineering works in unstable upland conditions, not as minor mitigation.
- The peat-dominated nature, size and location of any repository areas create risk to drainage, groundwater, surface water and adjacent bogland.
- The drainage of the site, and the control of groundwater and pollutants entering underground and surface water channels, remain central unresolved issues.
- The construction of each turbine, hardstanding, access road, compound, drainage system and borrow pit would interfere with the natural terrain and dissect habitats, nesting areas and hunting sites.
- The development would have a destructive effect on adjacent upland bog, including the NHA bog above and overlooking the site.
- There is risk of bog movement in the upland bog NHA adjacent to the wind farm, including visible bog slippage and exposed peat on the lower end of the upland bog adjacent to the road to Kiltyclogher.
- The proposed drainage system is highly complex and would be imposed across an already sensitive and saturated upland landscape.
- The large number of unmapped caves, borrow pits, swallow holes and marshy areas within and surrounding the Study Area means the risk cannot be fully understood without direct investigation.
- Trees felled by Storm Eowyn and other recent storms, especially visible around the T7 and T8 areas, show the changing and unstable landscape conditions now affecting the site.
- Turbines located on the slopes of Dough Mountain are in thick forestry and could not be comprehensively surveyed for peat depth, habitats, birds, bats, caves, drainage or ground conditions.
- The development cannot reasonably be said to withstand mitigated risk where bog movement and overhanging movement are already visible on the slopes of Dough Mountain.

For these reasons, the Croagh Wind Farm refusal pointers should not be treated as remote or unrelated. They apply directly to Lissinagroagh Wind Farm and support refusal because the site is a peat-dominated, upland, sloping, high-rainfall, water-sensitive and landslide-susceptible landscape.

4B. Comparison of Croagh Wind Farm Refusal Issues with Lissinagroagh Wind Farm

I submit that the comparison between Croagh Wind Farm and Lissinagroagh Wind Farm should be placed before the Board as a central planning consideration. The Croagh refusal is relevant because it identifies the same categories of physical, hydrological, peatland, construction and landscape risk that arise at Lissinagroagh. The issue is not that the two sites are identical in every respect. The issue is that the same refusal-level risk factors are repeated at Lissinagroagh, and in several respects they are intensified by the presence of Dough Mountain, Dough/Thur Mountains NHA, karst features, Lough Melvin SAC, Hen Harrier habitat and the wider Kiltyclogher landscape.

The Croagh refusal pointers include Geological Survey Ireland landslide susceptibility, historical landslides, mapped faults, caves, borrow pits, upland and sloping terrain, high rainfall, upland blanket bog, low-permeability bedrock, high water table, dense water channels, clear-felling, deep peat, water crossings, spoil handling, repositories, drainage control and the management of groundwater and pollutants. These are not remote or theoretical concerns. They are the same physical constraints present at Lissinagroagh.

At Lissinagroagh, the proposed works would include fourteen turbines up to 185 m, a permanent 100 m meteorological mast, new and upgraded access roads, hardstands, borrow pits, construction compounds, drainage works, watercourse crossings, forestry clearance, peat excavation, spoil handling and long-term site management. These works would take place in an upland peat, forestry, karst and water-sensitive landscape on and around Dough Mountain. The development therefore involves the same class of risk that led to serious concern in Croagh: major engineering intervention into unstable or sensitive upland peatland terrain.

The Croagh reasoning is especially important because it demonstrates that mitigation proposals cannot simply be accepted at face value where the underlying environment is high risk. Drainage designs, peat management plans, settlement ponds, monitoring and construction method statements do not remove the fundamental risk where a development requires extensive interference with peat, slopes, water channels, forestry and upland bog. The question for the Board is whether the applicant has removed scientific uncertainty. In my view, it has not.

The Lissinagroagh site presents a particularly strong case for refusal because the proposed wind farm is located beside and below the Dough Mountain upland and NHA landscape. Local evidence shows visible bog movement and exposed peat on the lower end of the upland bog adjacent to the road to Kiltyclogher. The upland bog is surrounded by steep gorges and flash flood channels from Dough Mountain. The site also contains or is surrounded by mapped and unmapped caves, borrow pits, swallow holes, marshy ground and karst features. These are the exact conditions where construction, drainage, excavation and spoil storage may trigger or worsen instability and water pollution.

The hydrological comparison is also significant. In Croagh, drainage, water crossings, groundwater control and pollutant pathways were central concerns. At Lissinagroagh, the risk is compounded by the Sraduffy River, County River and Lattone River route to Lough Melvin SAC, and by separate concerns regarding Lough Gill / Owanmore catchments. In a karst and peat landscape, pollutants may not follow simple mapped surface-water routes. The absence of complete dye tracing, karst testing and verified underground flow-path analysis means the applicant has not proved that pollution, sediment, concrete washout, hydrocarbons or peat disturbance can be safely contained.

The spoil and peat management comparison is equally important. The Croagh refusal pointers identify the risks associated with significant volumes of peat and spoil, waste material movement, repositories on bogland and hilly terrain, and retaining buttresses. Lissinagroagh also involves major peat and subsoil disturbance associated with turbine bases, hardstands, access roads, borrow pits, compounds and drainage works. Any repository or engineered containment area in peat-dominated upland terrain should be treated as a source of additional risk, not as a simple mitigation measure.

The forestry comparison is also directly applicable. Croagh identified the exposure of peat and subsoils following clear-felling. At Lissinagroagh, turbines and infrastructure are proposed in and around commercial forestry on upland peat. Trees fallen during Storm Eowyn and other recent storms are visible around the T7 and T8 areas. This shows that the forestry, peat and slope system is already vulnerable to extreme weather and windthrow. Clear-felling and construction would expose peat and subsoil to rainfall, erosion, drainage pressure and further instability.

There is also a biodiversity and habitat comparison. Access roads, turbine bases, hardstands, drainage and forestry clearance dissect natural habitats, nesting areas, hunting areas and wildlife movement corridors. At Lissinagroagh, this is particularly serious because the area is used by Hen Harrier and other raptors, and because the wider Dough Mountain upland functions as a connected peatland, hydrological and ecological system. The effects are not limited to the turbine foundations. The development would fragment habitat, displace wildlife and create collision and operational risks for birds and bats.

The landscape comparison is also important. Lissinagroagh would place fourteen 185 m turbines around Dough Mountain, permanently altering views of Lough Melvin, Saddle Hill, Shenaun, Farbreague, Sligo Bay, Truskmore, Conway North, Tievebaun, Benwiskin, Gortnagarn, Lackagh Mountain, Manorhamilton, Bembo Mountain, Naweeloge Top, South Leitrim, Fawley Falls, Donegal Bay, Kinlough, Bundoran, Barnsmore Gap, the Donegal Mountains, Garrison, Belles, Glenfarne, O Donnell's Rock and Arroo Mountain. The remaining northern views are already affected by another wind farm in the distance towards Cuilcagh Mountain. The applicant has not provided photographs or photomontages sufficient to show the full visual scarring across Co. Leitrim, Sligo, Donegal and Fermanagh.

For these reasons, the Croagh refusal should not be treated as an isolated decision with no relevance to Lissinagroagh. The comparison shows that the same environmental warning signs are present: peat, bog, steep slopes, high rainfall, water channels, forestry clearance, spoil management, repositories, landslide susceptibility, mapped and unmapped underground features, habitat dissection and landscape harm. The Board should apply the same caution to Lissinagroagh and refuse permission where scientific uncertainty remains.

In my submission, the Garvagh Glebe evidence supports refusal. It demonstrates that the risks are known, local, serious and capable of affecting rivers, fisheries, bogland, habitats, workers, residents and downstream protected waters. The receiving environment at Dough Mountain is too fragile and too important for this development, and permission should be refused.

Emergency planning, pollution barriers and monitoring cannot be treated as proof that the development is safe. They show that the development depends on temporary protection measures and rapid emergency action in an unpredictable upland peat and karst environment. Where pollution can enter karst vertically, and where water can reach Lough Melvin within approximately two hours, emergency response would come too late.

For Lissinagroagh, the risk is greater. The turbines are larger, the works are more extensive, the site is more widespread, and the receiving environment is more sensitive. Dough Mountain is a source area for watercourses across North Leitrim and beyond.

The Garvagh Glebe evidence does not reassure the Board. It does the opposite. It proves that peat failure, forestry felling, turbulence felling, river-risk, worker isolation, emergency rescue, pollution barriers and post-incident response are recognised risks in upland Coillte wind farm settings in County Leitrim.

4K. Conclusion on Garvagh Glebe and Lissinagroagh

It is not acceptable for a development of this scale, in this location, to rely mainly on developer-appointed contractors monitoring their own barriers, drains and mitigation measures. The consequences of failure would be borne by North Leitrim, Lough Melvin, Lough Gill, downstream fisheries, protected habitats, local communities, cross-border waters and other counties, not just by the developer.

This is made more serious by the absence of a clear independent public authority monitoring structure. I understand that the EPA has stated that it is not responsible for monitoring this development. If that is correct, the Board must ask who will independently monitor peat movement, water quality, karst pathways, flash-flood channels, sediment release, concrete pollution, hydrocarbon risk, fisheries impacts and downstream effects during construction, storms and post-construction operation.

This is the central problem. The proposed wind farm is one development, but the hydrological consequence of an accident or failure would not remain local. Water from upland source areas moves downhill and downstream through rivers, streams, drains, karst features, springs, swallow holes and catchments. Where the source is Dough Mountain, the receiving environment is regional and cross-border.

A pollution or peat-movement event arising from this one development could affect watercourses and catchments extending through North Leitrim and towards sensitive downstream areas including Lough Gill SAC, County Sligo, Lough MacNean, the Lough Erne catchment, Lough Melvin, Kinlough, Bundoran, County Donegal and South Fermanagh.

Dough Mountain is not an ordinary development site. It is an upland source area for a wide network of watercourses. The risk is therefore not confined to the turbine bases, access tracks or red-line boundary.

4J. Dough Mountain as a North Leitrim Source Area

The EIAR therefore cannot rely on emergency response as proof that Lough Melvin SAC and connected waters will be protected. The correct question is not whether the contractor can respond after an incident. The correct question is whether the development can be carried out without creating a realistic risk of pollution entering karst or fast-flowing watercourses in the first place.

All necessary emergency actions would have to occur within that short period, including detection of the incident, communication between workers, stopping works, locating the source, accessing the site, deploying plant and materials, installing barriers, notifying authorities, protecting workers, controlling machinery, protecting residents and attempting to prevent downstream pollution. In reality, those actions could not all be implemented within two hours, especially during heavy rain, low cloud, storm conditions, flash flooding, darkness, poor access or isolated turbine-site conditions.

I also submit, based on local knowledge of the catchment, that water flowing in streams and rivers from Dough Mountain can reach Lough Melvin within approximately two hours. This is highly significant. It means that any peat slide, sediment release, concrete pollution, hydrocarbon spill or polluted runoff entering a stream may reach Lough Melvin SAC before emergency works can be organised, mobilised and completed.

Surface-water mitigation measures such as silt fences, settlement ponds, check dams, interceptor drains or barriers do not solve this problem. These measures are designed mainly for visible surface runoff. They cannot reliably protect groundwater pathways where pollution enters vertically through karst.

This is a critical issue on and around Dough Mountain. The area contains karst features, springs, swallow holes, caves, peat, forestry drains, watercourses and fast-flowing upland drainage

pathways. If concrete washout, hydrocarbons, silt, peat fibres, sediment, metals, chemicals or other pollutants enter the ground vertically through karst openings, fissures, swallow holes or permeable pathways, there may be no practical means of stopping or recovering them before they move underground.

I submit that the EIAR also fails to address the most serious practical weakness in its mitigation approach: once pollutants enter the karst ground vertically, they cannot realistically be recovered, contained or mitigated.

4I. Karst Pollution and Two-Hour Flow Path to Lough Melvin

For fourteen 185 m turbines spread across upland peat and forestry, the number of required barriers and monitoring points would be vast. The EIAR has not shown how many people would be permanently present on site during bad weather to inspect and maintain these measures. It is not enough to say that monitoring will occur. The EIAR must identify staffing, locations, response times, equipment, access routes, communications systems and decision-making procedures.

By the time water is seen downstream, peat, silt or pollutants may already have entered the drainage network. Pollution barriers may be overrun during heavy rain or flash-flood events. If a barrier is overwhelmed, blocked, undercut, overtopped or washed out, it may fail at the exact moment it is most needed.

This is not a minor issue. Dough Mountain has isolated flash-flood channels and water pathways. Heavy rain can occur on the mountain while the lowlands of Leitrim remain dry. A person observing weather conditions in a village, compound or lowland location may not know that torrential rain is occurring on the summit, near T13 or T14, in a forestry block, beside a borrow pit or beside a small watercourse.

It should also explain who would inspect them, how often they would be inspected, how they would be maintained during heavy rainfall, how damaged or overtopped barriers would be repaired, and how monitoring would continue at night, during storms, during weekends and during shutdown periods.

The EIAR should identify every location where barriers would be required; every watercourse, drain, spring, flush, seepage pathway, swallow hole and cave that could receive pollution; every turbine, hardstand, access road, borrow pit, drainage feature and felling area that could generate sediment or peat movement; and the number, size and type of barriers required.

That raises a major practical problem for Lissinagroagh. If barriers are required to protect rivers and drains from peat movement, silt, sediment or polluted runoff, the EIAR must explain how such barriers can realistically be installed, maintained, inspected and repaired across a site of this scale.

The Garvagh Glebe correspondence is also relevant because it shows that bog movements were linked to works in the area and that barriers were required to prevent pollution. Those barriers had to be maintained for the lifetime of the works. This proves that peat movement and pollution were not remote or theoretical risks. They were risks requiring active physical intervention.

4H. Barriers, Monitoring and Flash-Flood Risk

The Garvagh Glebe evidence therefore shows a fundamental mismatch. Emergency response is designed for what happens after danger arises. Environmental Impact Assessment is supposed to determine before consent whether the site is suitable and whether significant environmental effects can be avoided. If the project requires emergency plans for peat failure affecting rivers, then the Board must ask whether the site should be developed at all.

This is critical for Lissinagroagh. FuturEnergy is proposing to build a major industrial wind farm on and around upland bog, forestry, watercourses, karst and slopes at Dough Mountain. The EIAR and

NIS are supposed to prevent significant effects on the environment before permission is granted. They should not rely on emergency reaction after peat failure, pollution or bog movement has already begun.

This is not a criticism of emergency responders. It is the reality of an emergency. If peat starts moving, if workers are isolated, if machinery is trapped, if roads are blocked or if local residents and authorities have to be alerted, the river, bog, habitat and downstream watercourse are already at risk.

That may be correct once works are underway and people are at risk. However, it also proves that once peat failure occurs, environmental protection is already secondary to immediate rescue, access, machinery and public safety.

The Garvagh Glebe emergency response approach also exposes a fundamental weakness in relying on emergency plans as mitigation. In an emergency, the correct first priority is human safety. The order of priority is employees, machinery, local residents and authorities, followed by prevention and response measures.

4G. Emergency Priorities Show Environmental Protection Would Come Too Late

This issue is not separate from environmental protection. If workers are isolated, machinery is trapped, roads are blocked or emergency access is compromised, then any peat slide, sediment release, hydrocarbon spill or pollution event may be much harder to contain quickly. Worker rescue risk and river-protection risk are linked.

It should also identify how many trained rescue personnel would be required on site, what equipment would be required, how rescue would operate during heavy rain, low cloud, winter conditions or storm events, and whether emergency services could safely access isolated turbine locations such as T13 and T14.

The EIAR should identify how many employees and contractors may be on site during peak construction, where they would be located, what areas are at peat-slide risk, what watercourses or saturated ground could isolate them, what emergency access routes would remain available during peat failure, storm conditions or flash flooding, and how rescue would be carried out if access roads were blocked or ground conditions failed.

That is highly relevant to Lissinagroagh. A rope-based emergency response may be conceivable for a small number of forestry workers in a defined felling area, but it is not realistic as a primary response for a major industrial wind farm construction site involving multiple crews, machines and contractors.

The Garvagh Glebe emergency planning is also relevant to worker safety. The seriousness of the risk is shown by the fact that rescue equipment, including ropes, had to be available in the event of a worker becoming isolated during works. In my submission, that level of emergency planning demonstrates that peat failure was considered capable of creating sudden dangerous conditions for people working on site.

4F. Peat Failure, Worker Isolation and Emergency Rescue Risk

For that reason, the EIAR cannot safely rely on observations taken while mature forestry was still present if the development itself requires forestry felling and major construction works. T13 and T14 should have been specifically identified and assessed as high-risk isolated turbine sites because of their proximity to watercourses, their upland position, the concealed hydrology under mature forestry, and the risk that foundations and hardstands would obstruct or redirect water movement from Dough Mountain.

The EIAR baseline could not properly measure the natural volume, direction and amount of water moving through these sites while the area was under mature forestry. Mature forestry intercepts rainfall, alters evapotranspiration, conceals ground conditions, masks surface seepage, hides small drains and channels, and makes comprehensive survey of peat, springs, flushes and groundwater expression much more difficult. Once forestry is felled, the hydrological behaviour of the site may change substantially.

Each foundation would interfere with the existing movement of water through the landscape. Water currently seeps through the soil and peat from higher ground. The construction of large turbine bases, hardstands, compacted road surfaces, cut-off drains and new drainage channels may interrupt, redirect or concentrate that water. This could increase local saturation, erosion, sediment movement, slope instability or flash flow into nearby watercourses.

T13 and T14 should therefore not be treated as ordinary turbine locations. They are proposed in a sensitive upland water-source environment where water seeps and moves downslope through soil, peat, forestry drains and natural channels from the summit and slopes of Dough Mountain. Their turbine foundations, crane hardstandings, access tracks, drainage works and associated construction areas would create artificial barriers and artificial drainage controls across natural water movement.

I submit that one of the most important Garvagh Glebe lessons is the treatment of works within 100 m of a river as a high-risk factor. That is directly relevant to proposed turbines T13 and T14, which are isolated turbine locations within 100 m of watercourses.

4E. 100 m River Risk and T13 / T14

The degree of disturbance cannot be safely calculated by reference to a smaller or older wind farm project. Dough Mountain is materially different because it is a source area for watercourses across North Leitrim. Any peat failure, drainage failure, sediment release, concrete pollution, hydrocarbon spill, karst contamination or slope movement could extend beyond the turbine bases and beyond the red-line boundary.

Although the Garvagh Glebe documents are specific to that site, the lesson for Lissinagroagh is even more serious. At the time of Garvagh Glebe, turbines of 185 m blade-tip height were not the type of development being assessed. The proposed Lissinagroagh Wind Farm involves fourteen 185 m turbines, a permanent 100 m meteorological mast, turbine foundations, crane hardstandings, access tracks, borrow pits, drainage works, forestry felling, cable trenches, watercourse crossings and construction compounds across a fragile upland peat, forestry, karst and water-source landscape.

The Forest Service material also recognised bog slide and landslide risk in the Sligo-Leitrim area, and raised matters including soil stability, water quality, habitats, SACs, SPAs, NHAs and cumulative effects. The Garvagh Glebe turbulence felling material is also relevant because it shows that forestry felling associated with turbine operation was part of the wind farm development context.

The Garvagh Glebe Peat Slide Emergency Response Plan was prepared for "rivers at risk from peat failure as a result of tree felling operations". This is highly significant. It confirms that peat failure arising from wind farm-related forestry operations was recognised as a real risk to rivers and downstream waters.

I submit that the Garvagh Glebe Wind Farm records are directly relevant to the proposed Lissinagroagh Wind Farm. They show that peat slide, bog movement, forestry felling, river-risk, worker safety, emergency rescue, pollution barriers and watercourse protection were already known risks in Coillte upland wind farm forestry settings in County Leitrim.

4D. Garvagh Glebe Peat Slide Evidence, Emergency Response Failure and Relevance to Lissinagroagh

4C. Climate Change, Rainfall, Storms and Leitrim-Specific Construction Risk

I submit that the EIAR does not give sufficient weight to recent weather changes in Ireland and County Leitrim when assessing peat stability, drainage, construction risk, forestry clearance, slope movement, water quality, biodiversity, emergency access and long-term resilience.

This is not a general climate argument. It is directly relevant to the suitability of Dough Mountain for wind farm development. The proposed development would place fourteen 185 m turbines, a permanent 100 m meteorological mast, access roads, crane hardstands, borrow pits, drainage works, cable trenches, watercourse crossings, construction compounds and forestry clearance into an upland peat, forestry, karst and water-source environment.

Met Eireann has confirmed that 2023 was Ireland's wettest year on record and also the warmest year on record. The Met Eireann material records that 2023 included the wettest March and wettest July on record, with March at 185% and July at 201% of their 1991-2020 long-term average rainfall. It also records numerous flooding events during 2023, including during Storm Betty and Storm Babet.

Met Eireann has also recorded that 2025 was Ireland's second warmest year on record, with the years 2022 to 2025 being the four warmest years in the Irish record. This shows that the climate baseline is changing during the very period in which this project is being assessed and promoted.

The EPA states that Ireland has already seen an increase in average annual national rainfall and projects a substantial increase in the frequency of heavy precipitation events in winter and autumn. This is particularly relevant because winter and autumn are also periods when upland ground, peat and drainage systems may be saturated and when construction outside the bird breeding season may coincide with wetter conditions.

The Climate Statement for January 2026 records repeated frontal rainbands, prolonged heavy rainfall and significant flooding during and after Storm Chandra. Storm Eowyn also demonstrates the scale of recent storm risk. Met Eireann records that Storm Eowyn brought Ireland's highest sustained and gust wind speeds, including a gust of 184 km/h at Mace Head and a 10-minute mean wind speed of 142 km/h. These are not ordinary weather conditions. They show the type of extreme storm environment that must be considered when assessing forestry windthrow, turbine resilience, access roads, ESB lines, communications infrastructure, drainage, water monitoring and emergency response.

County Leitrim's own Climate Change Risk Assessment is directly relevant. It records that recent surface-water and river flooding events in 2020, 2021 and 2022 caused damage to bridge infrastructure, inundation of buildings and transport disruption in Leitrim. It also states that projected increases in extreme precipitation will increase surface-water and riverine flood risk for County Leitrim. The same Leitrim assessment records that flash flooding from heavy rainfall damaged Ballinaglera bridge in August 2021 and that heavy rainfall in June 2020 caused a major peatland slip at Greaghnaglogh involving approximately 160,000 tonnes of peatland.

This is highly relevant to Lissinagroagh. Peat movement, bridge damage, flash flooding, road damage and transport disruption are not theoretical risks in County Leitrim. They are already documented impacts. The proposed wind farm would involve major construction on an upland

peat and forestry landscape with steep slopes, drainage channels, borrow pits, exposed peat, watercourse crossings and downstream links to Lough Melvin SAC and other sensitive waters.

The Leitrim Climate Change Risk Assessment also records that severe windstorms are frequent in County Leitrim and can disrupt transport, electricity and communication networks, including through tree fall on overhead lines. This supports my concern regarding forestry windthrow, ESB resilience, Net1 telecommunications, emergency communications and access during and after storms. The storm-damaged forestry visible around parts of the proposed site, including the T7 and T8 area, should be treated as evidence of real climate exposure and instability, not as a minor forestry issue.

Climate change also increases risk through heat, drought and fire. The Leitrim assessment records that heatwaves and droughts have damaged road surfaces, contributed to uncontrolled fires and caused water-supply restrictions, and that such events are projected to become more frequent. This matters because upland peat and heath are vulnerable not only to saturation and slippage, but also to drying, oxidation, fire and long-term habitat damage.

For these reasons, the EIAR should not rely on normal or historic assumptions about rainfall, drainage, ground stability and construction conditions. It should assess the project against the present and emerging climate reality: wetter extreme events, prolonged rainfall, flash flooding, severe storms, forestry windthrow, peat movement, drought, fire risk, infrastructure disruption and changing baseline conditions.

This is also directly relevant to the proposed long permission period. If a ten-year permission is granted, construction may occur long after the original surveys and assumptions were made. During that time, rainfall patterns, peat condition, forestry condition, drainage behaviour, storm damage, biodiversity use and watercourse conditions may all change. The EIAR should not be accepted where the climate baseline may be stale before construction even begins.

I submit that the recent Met Eireann evidence, EPA climate projections and County Leitrim Climate Change Risk Assessment all support a precautionary approach. Dough Mountain is an upland peat, forestry, karst, hydrological and ecological source area. It is not a suitable location for major wind farm infrastructure in a period of increasing weather extremes. The combination of climate change, high rainfall, storm exposure, peat instability, forestry windthrow, flash-flood channels and downstream protected waters weighs strongly against permission.

Sources relied on for this section include Met Eireann material confirming 2023 as Ireland's wettest and warmest year on record; Met Eireann Annual Climate Statement for 2025; Met Eireann Climate Statement for January 2026 and Storm Eowyn material; EPA climate change material on increased heavy precipitation; and the County Leitrim Climate Change Risk Assessment.

4L. GSI/GIS Mapping, Incomplete Bog Movement Records and Unreliable Baseline Risk Assessment

I submit that the EIAR cannot minimise landslide and peat-movement risk where the GSI/GIS mapping shows that the proposed Study Area is in, beside or immediately connected to mapped higher-risk landslide susceptibility areas. This mapping should be treated as a warning sign, not as reassurance.

The EIAR cannot safely rely on the absence of a recorded landslide within a narrow site boundary as proof that the site is stable. Bog movements, peat slips, drainage failures and slope instability are

often local, historic, undocumented or only known to landowners, forestry operators, local residents, farmers and people familiar with the mountain.

This is especially important where Coillte is the landowner of much of the relevant upland forestry landscape. If Coillte does not maintain an official, complete and accessible record of past bog movements, current bog movement, drainage failures, peat instability, forestry-related ground movement and potential future risk areas on its lands, then the GSI database cannot be assumed to contain a complete record of the true condition of the landscape.

GSI records can only be as complete as the information reported, investigated and made available to it. If the majority landowner does not record or report bog movement systematically, then the national mapping will inevitably understate the true level of risk. The absence of a mapped event is not proof that no event occurred. It may simply mean that the event was not recorded, not reported, not mapped, or not investigated.

This is a serious weakness in the Lissinagroagh EIAR. The developer assessment appears to be mainly confined to the defined Study Area and the proposed wind farm footprint. There is no evidence that the applicant carried out a comprehensive field survey of bog movement, peat instability, drainage failure, slope movement, hidden watercourses, springs, swallow holes, caves, forestry drains and historic ground disturbance outside the Study Area across the wider Dough Mountain system.

That is not acceptable in this location. Dough Mountain is not a self-contained development platform. It is an upland peat, forestry, karst and hydrological source area. A peat movement event may begin outside the Study Area but still affect the proposed works, or may be triggered by works inside the Study Area and then travel beyond it. Water, peat, sediment and pollution do not stop at the applicant red-line boundary.

The same applies to mapped risk areas. If the GSI/GIS maps show red/orange higher-risk landslide susceptibility within or adjacent to the Study Area, the EIAR should not isolate individual turbine bases and conclude that the risk is acceptable. The whole connected upland system should be assessed, including adjacent slopes, forestry blocks, drainage channels, watercourses, karst features, known and suspected bog movements, historic peat disturbance and downstream pathways.

The Garvagh Glebe material reinforces this point. The existence of a Peat Slide Emergency Response Plan for rivers at risk from peat failure shows that peat failure in Coillte wind farm forestry landscapes in Leitrim was a known and serious risk. It also shows that emergency planning may become necessary when the actual landscape behaves differently from the assumptions made before or during development.

For these reasons, the EIAR findings on landslide risk, peat stability and bog movement should not be relied upon. The baseline is incomplete. The risk record is incomplete. The Study Area is too narrow. The Board cannot have the necessary certainty that the proposed development will not cause peat movement, watercourse pollution, habitat damage or downstream impacts. The precautionary conclusion should be refusal.

4M. Specific Turbine Location Risk - T1 to T14, Gorges, Flood Streams, Rivers, Cave, Borrow Pit and Watercourses

I submit that the EIAR peat, landslide and hydrology assessment is further weakened by the actual turbine locations selected across the site. The proposed turbines are not located on simple, dry, stable ground. They are repeatedly placed beside or above steep gorges, flood streams, rivers, hidden drainage routes, forestry drains, peat, seepage areas, caves, karst features, borrow pit areas and watercourse pathways.

T1 is located in forestry above a steep gorge. My photographic evidence shows bog slippage in this area. Any peat movement, drainage failure, construction runoff, sediment release or slope instability at T1 could move downslope into the gorge and connected watercourse system. T1 should therefore be assessed as part of a steep upland peat and gorge system, not as an isolated turbine base.

T2 and T3 on Saddle Hill are adjacent to flood streams. Flood streams can carry water, peat, sediment and pollutants rapidly during heavy rainfall. Construction of turbine foundations, hardstandings, access tracks, drains or cable trenches near these streams could alter flow paths, increase sediment mobilisation and create pollution risk.

T4, T5 and T6 are in flood-prone areas that are partly hidden by compacted forestry and are adjacent to steep gorges. Mature forestry can conceal drains, flushes, seepage zones, springs, peat instability and bog movement. Once forestry is felled and construction begins, rainfall and groundwater movement may change substantially.

T7 and T8 raise a separate and serious concern because they are located beside the cave area and proposed borrow pit. This makes them high-risk locations for karst, groundwater, peat stability, excavation, drainage and pollution. The cave is evidence of a karst landscape with underground water movement, voids, fissures, swallow holes or connected pathways. The proposed borrow pit beside this area greatly increases the risk.

T9, T11 and T12 are adjacent to rivers. These turbine locations should have been treated as high-risk locations because construction activity beside rivers creates a direct pathway for sediment, peat fibres, concrete washout, hydrocarbons, silt and disturbed soil to enter flowing water. In an upland catchment, pollution entering a river can move quickly downstream before emergency measures can be put in place.

T13 and T14 are isolated turbine locations within 100 m of watercourses. They are proposed in a sensitive upland water-source environment where water seeps and moves downslope through soil, peat, forestry drains and natural channels from the summit and slopes of Dough Mountain. Their foundations, hardstandings, access tracks and drainage works would create artificial barriers and artificial drainage controls across natural water movement.

The cumulative pattern is clear: T1 above a steep gorge; T2 and T3 beside Saddle Hill flood streams; T4, T5 and T6 in hidden flood areas beside steep gorges; T7 and T8 beside the cave and borrow pit; T9, T11 and T12 adjacent to rivers; and T13 and T14 within 100 m of watercourses. This shows that the proposed layout repeatedly places major industrial infrastructure in the most sensitive water, peat, karst and slope-risk areas of the mountain.

In my submission, the turbine layout itself is evidence of unsuitability. The repeated siting of turbines beside rivers, flood streams, steep gorges, cave/karst features, borrow pits and hidden drainage areas supports the conclusion that Dough Mountain, Saddle Hill and the wider upland system are not suitable for this wind farm development. Permission should be refused.

5. Biodiversity, Hen Harrier and Protected Species

The site and surrounding uplands are of exceptional biodiversity importance. The EIAR and scoping material confirm Hen Harrier nesting activity within the Study Area. Hen Harrier is an Annex I species and is one of the most important protected bird species in this objection.

Local evidence confirms Hen Harriers hunting and moving through the area, including around Dean's Lake, Lough Melvin, Aughavanney, Glenfarne, Kinlough and the proposed turbine areas. Hen Harriers have been seen hunting in the grassland below proposed T7, flying over T9 and T10, and nesting and hunting adjacent to T13.

The Faughery Wind Farm bird surveys from 2015, 2017 and 2019 are highly relevant. They show Hen Harrier activity, flight paths and use of the wider Dough Mountain uplands. The EIAR should have fully assessed these surveys, because they provide operational and post-construction evidence from the adjacent wind farm landscape. It is not enough to rely only on the most recent surveys without clearly integrating the Faughery evidence.

The wider area also supports or may support Curlew, Ring Ouzel, Buzzards, Eagles and other raptors, bats, Marsh Fritillary butterfly and White-clawed Crayfish in connected water systems. Local people and tourists regularly observe wildlife, including Whooper Swans, Hen Harriers and other birds. The area remains one of small-scale rural farming, upland bog, forestry edge, open habitat and watercourses. This mosaic is part of its biodiversity value.

Marsh Fritillary Butterfly - Need for Targeted Seasonal Survey

The Marsh Fritillary butterfly should be specifically assessed. It is an Annex II species under the Habitats Directive and is associated with habitats including bog, upland heath and grassland where Devil's-bit Scabious is present. These are the same broad habitat types present in the wider Dough Mountain, Saddle Hill and Thur Mountain upland environment.

A general biodiversity walkover is not enough to exclude risk to this species. Marsh Fritillary assessment requires targeted habitat assessment and, where suitable habitat exists, seasonal larval web surveys at the correct time of year, particularly September and October. If the applicant has not carried out targeted Marsh Fritillary habitat and larval web surveys across the full area affected by turbines, access roads, borrow pits, drainage works, forestry clearance, grid works and replacement forestry lands, the EIAR is incomplete.

This is also a cumulative issue. Small losses, drainage changes, access-road construction, vegetation clearance and altered grazing or forestry management can fragment habitat and affect larval food plant availability. The assessment should therefore consider Marsh Fritillary habitat within the full zone of influence, including the wind farm site, adjacent upland heath and bog, access routes, drainage corridors and any areas indirectly affected by changes in water movement or land management.

The EIAR acknowledges potential loss of nesting and foraging habitat, but the conclusion does not reflect the seriousness of that loss in a confined upland area already affected by Faughery Wind Farm. The question is not whether some mitigation can be proposed. The question is whether this location should be industrialised further when it supports protected raptor activity and functioning upland habitat.

The development would also be likely to cause extensive displacement of birdlife and wildlife from the open bog, forestry-edge, ravine and upland hunting areas around Dough Mountain. Turbine collision risk, habitat loss, tree felling, road construction, drainage, blasting or excavation, lighting, human activity and operational turbine movement would all increase risk to birds and bats. In my view, the development will result in avoidable bird and bat mortality and long-term displacement from nesting, feeding and commuting areas.

6. Lough Melvin SAC, Fisheries and Downstream Impacts

Lough Melvin SAC is a sensitive and internationally important water body. It supports important fish species, including unique salmonid populations. The County River and Lattone River system

connect the uplands to Lough Melvin. Dean's Lake is also important locally and has been identified as relevant to emergency fish stock.

Any sediment, peat, hydrocarbon, concrete, chemical or nutrient release from the development could affect downstream fisheries and habitats. Inland Fisheries Ireland previously stated in FOI correspondence that no site visit had yet taken place at that stage. IFI also warned against diversion of watercourses or increasing flow speed. In a site with many narrow drainage channels and steep slopes, these concerns are extremely relevant.

The Blackwater fish kill example shows how catastrophic water pollution events can be for fish populations. A major incident in the Lough Melvin catchment could have serious ecological, cultural, economic and reputational consequences.

The EIAR must be judged on whether it provides scientific certainty that Lough Melvin SAC, its tributaries and connected habitats will not be adversely affected. I do not believe it does.

7. Dough Mountain NHA and Upland Landscape

Dough / Thur Mountains NHA is a protected upland landscape containing blanket bog, heath, grassland and important habitats. The fact that commercial forestry areas may have been planted before designation does not mean the underlying peat, water movement or habitat network is unimportant.

The proposed development would further fragment and industrialise an upland landscape already affected by Faughery Wind Farm. The turbines would rise to a very significant height above the local plateau and skyline. With turbine foundations at high elevation, the rotor tips would dominate views from Kiltyclogher, surrounding roads, walking routes, farms, heritage sites and tourist locations.

Photomontages do not adequately represent the views experienced by the wider population. They do not capture the daily experience of local residents, walkers, drivers, visitors, farmers or people using the Heritage Centre, caravan area, river walks and caving routes.

This is not an ordinary commercial forestry site. It is part of the wider Dough Mountain upland landscape, visible from and connected to Kiltyclogher and Lough Melvin.

The wider upland skyline and landscape setting, including views associated with Bembo Mountain and the surrounding border uplands, should be considered as part of the visual and cumulative landscape assessment. These landscapes are experienced as one wider upland setting by residents and visitors, not as isolated development parcels.

The landscape impact is not limited to one local viewpoint. Current unobstructed views and the wider setting of the following mountain ranges, bays, towns and recognised scenic locations would be permanently altered or lost if Lissinagroagh Wind Farm is built: Lough Melvin, Saddle Hill, Shenaun, Farbreague, Sligo Bay, Truskmore, Conway North, Tievebaun, Benwiskin, Gortnagarn, Lackagh Mountain, Manorhamilton, Bembo Mountain, Naweeloge Top, South Leitrim, Fawley Falls, Donegal Bay, Kinlough, Bundoran, Barnsmore Gap, the Donegal Mountains, Garrison, Belles, Glenfarne, O'Donnell's Rock and Arroo Mountain. The only remaining open views would be towards areas to the north where another wind farm is already located and, in the distance, Cuilcagh Mountain.

FuturEnergy has not, in my view, provided photographs or photomontages that adequately show the visual scars that the wind farm, roads, borrow pits, felling, hardstands and turbine bases would leave across the surrounding countryside of County Leitrim, Sligo, Donegal and Fermanagh.

The bog plateau is a vast flat and exposed upland area. In the event of fire, the damage to peat, heather, nesting habitat, feeding habitat and protected species could take many years to recover. There is also risk from swallow holes, marsh ground and hidden karst features on the summit and edges of Dough Mountain NHA.

8. Kiltyclogher Village, Community and Tourism

Kiltyclogher is a small rural border village that has worked hard to survive depopulation. The community launched the Kilty Live campaign in 2017, which received national attention and helped attract families to the area. The village is known for community spirit, cultural integration, crafts, music, heritage, walking and rural tourism.

The proposed wind farm would directly affect the future of Kiltyclogher. The village is developing tourism opportunities, including a caravan parking area facing the mountain. The Heritage Centre provides tours to Sean Mac Diarmada's home and local heritage sites, including walking tours and river walks. Cavers regularly use the area and stay locally. Visitors come for wildlife, landscape, peace, farming character, upland views, rivers and heritage.

The proposal would place a large industrial wind farm on the mountain backdrop of the village. This would damage the landscape setting that Kiltyclogher relies on for tourism, local pride and future regeneration. It would also affect the amenity of residents who live in a rural area because of its quietness, views, wildlife and heritage.

The EIAR does not give sufficient weight to the lived reality of Kiltyclogher village. The impact is not just visual. It is social, cultural, economic and psychological. It affects whether the village can continue to attract families, visitors, walkers, cavers and heritage tourists.

Leitrim Tourist Office and Failte Ireland do not heavily promote this sensitive upland plateau as a mass tourism attraction because of the need to protect its habitats, nesting and feeding sites for Hen Harrier, Sand Martins and other wildlife, and its untouched upland bogland character. That sensitivity should not be used against the area by suggesting it has low tourism value. The opposite is true: its value lies in its quietness, remoteness, wildlife, intact views and ecological sensitivity.

9. Archaeology, Heritage and Caves

The area contains important heritage features, including the Neolithic tomb in Tullyskeherney, now recognised as a National Monument, and nearby cave and karst features. Coillte forestry was planted very close to the tomb, showing that historic land management has not always protected heritage appropriately.

The cave and fast-flowing water feature beside the heritage area raise both archaeological and hydrological concerns. Caving activity is part of local tourism and community knowledge. Underground features may also be connected to water movement towards Lough Melvin.

The EIAR should fully assess the interaction between archaeology, karst, underground water, tourism, public safety and construction activity. Heritage cannot be assessed separately from hydrology and landscape where caves, tombs, upland bog and water flow occur together.

10. Roads, Borrow Pits, Traffic and Construction Impacts

The development would require extensive construction works, including approximately 8.5 km of new internal access roads, turbine hardstands, borrow pits, compounds, drainage works, forestry felling and turbine delivery. The volume of heavy vehicle movements appears likely to be significant.

The local road network is rural and already affected by heavy timber haulage from Coillte forestry. Construction traffic, double trailers, abnormal loads, stone, concrete, peat and spoil movements would place further pressure on narrow roads, bridges, water crossings, residents and road users.

The EIAR must fully identify all traffic, not just turbine component movements. It must include bog removal, excavation, road building, borrow pit material, concrete, imported stone, construction plant, forestry removal, grid connection works and reinstatement.

There is also a risk of invasive species being introduced by large volumes of imported material and machinery. Dust, spores, seeds and contaminated soil could be spread by construction traffic and by wind turbulence across the plateau and down watercourses.

100 m Meteorological Mast - Temporary 2021 Application and Current Permanent Proposal

This is important because the 2021 mast planning application was for a temporary 100 m meteorological mast, whereas the current proposal includes a 100 m mast in a different location as a permanent part of the wind farm infrastructure. A temporary refused mast should not be used to normalise or justify a permanent mast in a different position within a more extensive wind farm development.

The previous 2021 planning application for a 100 m meteorological mast was presented as a temporary mast. That application was refused after a Further Information process, and works had already appeared to commence on site, including site clearance and solar panels. This planning history must be addressed openly and should not be treated as irrelevant background.

The current proposal is different. It relates to a mast in a different location and it is presented as part of the permanent wind farm infrastructure. A temporary 100 m mast used for measuring wind is very different from a permanent mast associated with a fourteen-turbine industrial wind farm. The EIAR and planning assessment should clearly explain why a previously temporary mast proposal was refused, how the current mast differs, why the location has changed, and how its permanent presence affects landscape, aviation, peat, hydrology, telecommunications and cumulative impact.

The mast issue also supports my concern that the project has changed repeatedly over time, while the public has had to follow separate references, changing layouts and incomplete information. The mast should be assessed cumulatively with the turbines, access roads, borrow pits, grid works, aviation constraints, Net1 communications and the wider upland landscape.

10A. Stone, Rock Fill, Borrow Pits, Restricted Storage and Emergency Access Failure

I submit that the EIAR fails to properly quantify the amount of stone, rock fill, emergency material, storage space and long-term containment material required for the proposed Lissinagroagh Wind Farm.

This is a fundamental issue because the development is not a simple road or isolated turbine project. It involves fourteen turbines up to 185 m high, a permanent 100 m meteorological mast, turbine foundations, crane hardstandings, access roads, borrow pits, drainage works, forestry felling, cable trenches, watercourse crossings, construction compounds and movement of peat, bog material, stone, concrete, machinery and emergency supplies across a fragile upland peat, forestry, karst and water-source landscape.

The Croagh Wind Farm Inspector Report is highly relevant. In that case, the Inspector recorded very large volumes of peat and spoil requiring handling, storage and management, and raised serious concerns regarding repository construction, drainage, groundwater, rock conditions, buttressing and long-term containment. The Croagh report is important because it shows that peat, spoil, stone and repository uncertainty is not a minor construction detail. It goes to the environmental safety and practical workability of a wind farm in upland peat conditions.

The Croagh report also shows that stone buttresses and rock fill may be required to contain peat and spoil repositories. For Lissinagroagh, the EIAR must therefore explain not only how much peat and spoil may be moved, but also how much stone and rock fill will be required to contain, stabilise, drain and protect those materials. It must also explain where those materials will be stored and how they will remain available when needed.

The applicant must answer basic questions. How much stone must be available on site before excavation begins? How much stone or rock fill is required for each borrow pit? How much is required for emergency response if peat movement occurs? How much is required for drainage, check dams, barriers, buttresses, roads and hardstands? How much stone is required for fourteen 185 m turbines? Where will that stone be stored before it is needed? Will it be stored beside borrow pits, roads, watercourses or peat areas? Can it be safely stored without creating further runoff, sediment or slope risk?

It is not enough for the EIAR to assume that stone will be available if needed. During heavy rain, flash flooding, bog movement, forestry windthrow or blocked roads, it may be impossible to transport stone quickly to an isolated turbine, borrow pit or watercourse. If emergency rock fill is not already in the correct place, the response may come too late. If it is stored close to the works, its weight may increase ground pressure and worsen instability.

This uncertainty is especially serious because the three proposed borrow pits are adjacent to surface watercourses. Borrow pits are not minor construction features. They involve excavation, rock breaking, haulage, exposed faces, altered drainage, machinery movement, fuel risk, sediment release, slope disturbance and long-term stability issues. Where borrow pits are located beside surface watercourses, the pollution pathway is immediate and direct.

The company also cannot be certain of the true amount of bog, peat, saturated soil and spoil that will have to be excavated, moved, stored or placed into borrow pits. Until the land is opened up, trees are felled, peat is excavated and ground conditions are exposed, the applicant cannot know the full depth, saturation, structure, instability or volume of peat and bog material that will actually have to be handled.

That uncertainty matters because the environmental effects depend on the volume and condition of the material being moved. If the company cannot be certain of the quantity of peat and bog material to be moved into borrow pits, then it cannot scientifically quantify the effects of that movement.

This is particularly important at T13, T14, T7, T8 and T5, where the available storage area is restricted and the risk is greater. These are constrained upland locations close to watercourses, steep ground, karst features, the cave area, borrow pit areas, hidden drainage routes, forestry, peat and steep embankments.

At T13 and T14, the concern is especially serious because they are isolated turbine locations within 100 m of watercourses. Any emergency response material would need to be close enough to be useful, but storing heavy stone, rock fill or construction material near those locations may itself increase pressure on peat, slopes and drainage pathways. This creates a contradiction. If stone is stored far away, it may not be available quickly enough in an emergency. If it is stored close to the works, its weight may worsen instability.

At T7 and T8, the concern is increased by the cave area and borrow pit. These locations raise karst, groundwater, slope, excavation and pollution risks. Heavy storage of stone, rock fill, plant or emergency material beside a cave, borrow pit or karst pathway may alter drainage, increase loading on fragile ground, damage subsurface pathways or contribute to instability.

At T5, the concern is the sensitive slope and forestry area associated with Dough Mountain. Where works occur on or near steep embankments, the placement of heavy material may increase outward pressure on the slope. That pressure can change the balance of peat and subsoil, particularly where the ground is already saturated, drained, disturbed by forestry roots or affected by hidden water movement.

This is not a minor construction logistics issue. In an upland peat landscape, the weight of stored stone, rock fill, machinery and materials can itself become a geotechnical risk. It may compress peat, force water outward, increase pore-water pressure, destabilise the edge of tracks or hardstands, and contribute to slippage on steep embankments.

The risk is even greater because the potential slippage source is from the summit and upper slopes of Dough Mountain. In that context, stored construction material may not prevent movement. It may instead become additional loading or material feeding a moving slope. If bog movement begins upslope, stone, spoil, stored materials, disturbed peat, drainage structures and construction debris could be caught up in the movement and carried downslope towards watercourses, gorges, karst features or rivers.

A further problem is that, as construction progresses, there may be fewer safe places for transport machinery, construction vehicles and emergency supplies to move through or be positioned on the site. Access roads may be occupied by machinery, stone deliveries, concrete vehicles, excavators, drainage works, cable trenching, peat movement, tree felling, temporary barriers, settlement ponds, spoil handling and partially completed turbine works.

This means emergency supplies may be required at the very time when movement across the site is most difficult. If peat movement, flash flooding, drainage failure, pollution, machinery blockage or slope instability occurs, emergency stone, rock fill, pumps, barriers, plant, fuel, spill kits and rescue equipment may have to be transported through a site already obstructed by ongoing works.

The EIAR should explain how emergency supplies will reach T13, T14, T7, T8 and T5 if access tracks are blocked by machinery, peat movement, flooding or forestry windthrow. It should explain how vehicles will turn, pass or reverse on narrow upland access roads during an emergency. It should explain how concrete lorries, stone lorries, excavators and emergency vehicles will move at the same time. It should identify how many trained workers will be permanently available on site to open routes, move machinery, install barriers and respond to pollution.

This issue is directly linked to the Garvagh Glebe evidence. The Garvagh Glebe Peat Slide Emergency Response Plan was prepared for rivers at risk from peat failure as a result of tree felling operations. The existence of that plan shows that peat failure and river-risk conditions are real in

Coillte upland wind farm forestry settings in County Leitrim. It also shows that response planning must deal with real access, rescue, machinery, watercourse and worker-safety problems, not just paper mitigation.

For Lissinagroagh, the difficulty is greater because the proposed works are spread across a fragile upland peat, forestry, karst and water-source environment. A construction programme involving fourteen 185 m turbines cannot assume that emergency access will remain available at all times. As the site becomes more disturbed, the number of safe routes and safe storage areas may reduce.

This is not a minor traffic-management issue. It goes directly to whether mitigation can work in practice. If emergency materials cannot reach the correct location in time, then barriers, stone, pumps and response plans are only theoretical. They will not protect watercourses, peat, karst features, rivers or Lough Melvin SAC once an incident has begun.

In my submission, the EIAR has not shown that emergency stone, rock fill, machinery, storage areas and trained workers can be moved safely and quickly across the site as construction progresses. The more the project advances, the greater the risk that access becomes restricted, storage becomes unsafe, and emergency response becomes too late.

The precautionary conclusion should be refusal. The proposed layout places major works and heavy materials into constrained, fragile and hydrologically connected upland areas, and the EIAR has not demonstrated that the storage, movement and emergency availability of stone and rock fill can be achieved without increasing the very bog movement, slippage and watercourse pollution risks the measures are supposed to prevent.

11. Noise, Shadow Flicker, Aviation and Telecommunications

The proposed turbines would create noise, shadow flicker and visual movement across a rural upland community. Fourteen turbines at 185 metres height could affect dwellings, roads, farms and public viewpoints from multiple directions.

Shadow flicker should not be treated only as a computer model. Local residents, drivers and visitors may experience simultaneous or repeated effects depending on sun angle, topography and turbine layout.

The area also experiences low cloud, heavy rainfall and poor visibility. Air Rescue helicopters, Air Corps aircraft and light aircraft are known to cross the Dough Mountain and border area. The combination of high turbines, upland terrain and frequent low cloud requires serious aviation assessment.

The Net1 mast on the ridge is also important. Many households rely on it for internet access and emergency communication, particularly where other services are weak. Any interference with the mast or communications infrastructure would affect rural households and resilience during storms and power outages.

12. Forestry, ESB Resilience and Storm Risk

The site is located within and beside commercial forestry. Storm events have shown the vulnerability of rural infrastructure where ESB lines pass through Coillte forestry and trees are planted close to lines. Storm Eowyn showed how quickly rural communities can lose power and communications.

The EIAR must assess forestry windthrow, peat instability, road access, emergency response, ESB infrastructure, communication masts, drainage and storm resilience together. The development

would add major infrastructure into an already vulnerable upland forestry and peat environment.

13. Public Participation and Consultation

The consultation process was inadequate. Earlier consultation consisted of limited by appointment only sessions in Rossinver Community Centre. Rossinver is not Kiltyclogher. Public transport is limited and this format excluded or discouraged elderly people, disabled people and people without transport.

The development changed over time from earlier larger turbine numbers to the current fourteen-turbine layout. The public was not given a clear, complete and accessible picture of the full project, including the separate grid connection and design flexibility process.

Meaningful public participation requires full information at the right time. The community should not have to discover the grid connection, design flexibility, turbine delivery route, scoping gaps and environmental omissions through FOI, AIE requests and separate planning references.

14. Cumulative Impact with Faughery Wind Farm and Other Development

The EIAR does not adequately address the cumulative impact of the proposed wind farm with Faughery Wind Farm, adjacent forestry, existing roads, previous mast works, the current permanent mast proposal, other wind energy proposals and wider grid infrastructure.

Faughery Wind Farm is directly relevant. It has already changed the original landscape and upland bog environment. It also produced bird survey evidence that should be central to the assessment of Hen Harrier and other species using the wider Dough Mountain area.

The fact that the current proposal is separate on paper does not mean the ecological, hydrological and landscape impacts are separate in reality. Birds, bats, peatland hydrology, watercourses, views, tourism and communities experience the cumulative effect.

The cumulative assessment must also include Faughery Wind Farm survey evidence from 2015, 2017 and 2019, the 2021 temporary mast application and refusal, the current permanent 100 m mast proposal, forestry operations, storm-damaged forestry, grid connection works, turbine delivery route works, drainage changes, water crossings, peat excavation, borrow pits, replacement forestry lands and any wider North West grid reinforcement required to export electricity from the project.

It is not sufficient to assess each element as if it is isolated. The receiving environment experiences the combined effect: loss and fragmentation of upland habitat, displacement of birds and bats, collision risk, disturbance to Hen Harrier and other raptors, peat drainage, sediment movement, water-quality risk, hydrological change, visual dominance, tourism impact and community impact. The cumulative baseline should include the existing altered landscape caused by Faughery Wind Farm and forestry, not treat the Lissinagroagh site as a blank or isolated forestry block.

The need for cumulative assessment is made more serious by the separate references for the wind farm, grid connection and design flexibility option. The Board should not allow a fragmented assessment where the wind farm is assessed first and the grid, route, ecology, hydrology, bird, bat and watercourse impacts are left to later or separate processes. In my

submission, the cumulative effects have not been assessed with the necessary certainty and this weighs strongly against permission.

15. Design Flexibility and Ten-Year Permission

The application seeks a long construction period and design flexibility. This is unacceptable in such a sensitive location.

The project began around 2017 and the current application is in 2026. If a ten-year permission is granted, the development could be built many years after the environmental surveys and assumptions were made. During that period, scientific knowledge, climate conditions, raptor populations, hydrology, legislation, planning policy and local circumstances may change.

Design flexibility should not be used to avoid full public scrutiny. Turbine height, location, road layout, drainage, grid connection and construction methods matter greatly in an upland peat and karst environment. The public should not be asked to accept future changes without full assessment and a fresh opportunity to comment.

15A. Ten-Year Permission, Climate Change, Storm Eowyn, Forestry Damage and Unpredictable Ground Conditions

I submit that the uncertainty over peat volumes, borrow pit capacity, drainage, tree felling, water movement and climate change becomes a fundamental failure when considered alongside the applicant request for a long permission period.

The EIAR is based on surveys, assumptions and site conditions recorded at a particular point in time. However, the applicant is seeking permission for a development that may not be constructed for many years. During that period, the receiving environment on Dough Mountain may change substantially.

Nobody can reliably predict the combined effects of climate change, increased rainfall intensity, prolonged wet periods, drought and peat drying, storm events, forestry windthrow, disease or forestry decline, commercial tree felling, drainage changes, peat saturation, bog movement, erosion, blocked drains, altered springs, flushes, seepage routes, and changed water flow after tree removal.

This is especially serious because the site is not stable, open, lowland ground. It is an upland peat, forestry, karst and water-source environment. Mature forestry currently conceals much of the true hydrology, peat condition, drainage pattern, slope instability and seepage behaviour. Once forestry is felled, damaged by storm, or altered by management, the water regime may change substantially.

Tree felling can reduce rainfall interception, alter evapotranspiration, expose peat, increase runoff, change soil moisture, affect slope stability and reveal drainage pathways that were not visible during EIAR surveys. Therefore, an assessment carried out while mature forestry is present may not represent the ground conditions that will exist when construction actually begins.

Met Eireann has confirmed that 2023 was Ireland wettest year on record and also the warmest year on record. The January 2026 Climate Statement records prolonged heavy rainfall and significant flooding during and after Storm Chandra, while the Storm Eowyn material records extreme wind speeds. This recent weather evidence shows that the baseline is not fixed.

Storm Eowyn is directly relevant. Met Eireann records that Storm Eowyn underwent explosive cyclogenesis, reached peak intensity near the northwest coast of Ireland, and produced extreme

wind speeds, including a recorded gust of 184 km/h at Mace Head and a 10-minute mean wind speed of 142 km/h.

The relevance to Lissinagroagh is direct. The proposed wind farm is located in mature forestry on upland peat. Storm Eowyn has shown that forestry can be damaged, thrown, destabilised or made unsafe by extreme wind events. This is not a remote or theoretical concern. It has already occurred locally and nationally, including on Coillte forestry lands.

Where forestry is damaged by storm, the hydrology, peat stability, access, drainage, slope behaviour and survey baseline can all change. Fallen trees can block drains, expose peat, tear root plates from saturated ground, open new water pathways, increase erosion, destabilise slopes and make site access more difficult. Storm-damaged forestry can also force emergency felling or altered forestry management before construction ever begins.

This is a fundamental problem for a long permission period. A site assessed under mature forestry may later become a site of windthrow, exposed peat, blocked drains, changed runoff, altered watercourses, unstable root plates and emergency forestry works. The EIAR cannot assume that Coillte forestry will remain in the same condition for the duration of the permission period.

My own photographic evidence supports this concern. The photographs of the forestry at T8 and at the 2021 100 m meteorological mast location show the real condition of the site and the vulnerability of forestry, peat and upland ground in this area.

These photographs are relevant because they show that the EIAR cannot treat mature forestry as a fixed, stable or reliable baseline condition. Forestry may conceal peat, drainage, seepage, slope instability and water movement while standing. However, once forestry is damaged, felled, windthrown or disturbed, the ground conditions can change substantially.

The photographs at T8 show forestry conditions in an upland area close to proposed turbine infrastructure. They support my concern that storm events, windthrow, tree failure and forestry disturbance can expose peat, alter drainage, block water pathways, destabilise slopes and make access more difficult. This is directly relevant to the proposed turbine layout, drainage design, watercourse protection and emergency response planning.

The photographs of the 2021 100 m mast location are also important. They show that works and disturbance associated with wind-farm-related infrastructure can occur in sensitive upland forestry and peat conditions. The mast history is relevant because a 100 m mast was previously proposed in this area and the current Lissinagroagh proposal now includes a permanent 100 m meteorological mast as part of the wider development.

In my submission, this is a fundamental defect. The applicant is asking the Board to approve a development now, but the actual construction may occur years later on a changed mountain, with changed forestry, changed drainage, changed peat condition and more extreme climate pressures. The EIAR cannot provide the necessary scientific certainty for those future conditions.

A long permission would therefore undermine the reliability of the EIAR baseline. It would allow the developer to rely on an assessment that may be outdated before construction begins. For a fragile upland peat, forestry, karst and water-source site like Dough Mountain, that is unacceptable.

The precautionary conclusion should be refusal. At minimum, the Board cannot grant a long-duration permission where the applicant cannot predict the combined effects of climate change, Storm Eowyn-type events, tree felling, forestry windthrow, land-use change, peat movement, altered hydrology, borrow pit uncertainty and construction works over the proposed permission period.

16. Turbine Wake Turbulence, Upland Microclimate and Operational Effects on Dough Mountain

I also object because the EIAR has not adequately assessed the operational turbulence, wake effects and microclimatic changes that would be created by fourteen 185 m turbines on the Dough Mountain upland. Dough Mountain rises to approximately 460 m, while the proposed turbine tips would reach approximately 540 m above sea level. The rotating blades would therefore operate across an exposed upland airspace above and around the mountain, not in a lowland or already-industrial setting.

Wind turbines do not simply occupy a small physical footprint. During operation, turbines extract kinetic energy from the wind, increase turbulence, alter surface roughness and can modify the atmospheric boundary layer. These changes may affect near-surface temperature, humidity, wind speed, fog movement, soil moisture, vegetation conditions and ecological processes around and downwind of wind farms.

This is especially important on Dough Mountain because the receiving environment is an upland peat, heath, forestry and watercourse landscape. Research from a peatland wind farm in Scotland found that wind turbine operation affected ground-level microclimate, with potential implications for biogeochemical processes, ecosystem carbon cycling and the true carbon balance of wind energy. That issue is directly relevant here because the turbines would be placed in and around upland peat, blanket bog, wet heath, forestry, watercourses and sloping ground draining towards sensitive catchments.

Dough Mountain must be assessed as an extensive upland peat and surface-water system, not as a small bog feature at the edge of the mountain. The proposed turbines would not merely affect isolated turbine bases or the immediate bog areas around individual foundations. Their wake turbulence would operate across exposed upland airspace and could extend across the wider peatland, forestry, open heath, slopes, water channels and surface-water drainage network.

The mountain functions as a connected upland hydrological and ecological system. Any alteration to airflow, drying, humidity, fog movement, evapotranspiration or near-surface moisture has the potential to affect the wider upland environment, including areas away from the turbine bases. The EIAR should therefore have assessed turbulence and microclimatic effects across the entire Dough Mountain plateau and associated surface-water catchment, not only within narrow turbine construction footprints.

Earlier project material, including Newsletter 1 and Newsletter 2, showed or referred to a section of Dough Mountain within the wider project area. The public were therefore entitled to understand that the mountain formed part of the environmental setting of the proposed wind farm. However, the Study Area identified in the Planning Application has been reduced and does not scientifically analyse turbine wake turbulence across the full Dough Mountain upland. This is a serious omission.

The proposed turbine layout is particularly concerning because turbines are located to the north-west, west, south and south-east of Dough Mountain. This means the development would not create a single predictable wake in one direction only. Depending on wind direction, wind speed and atmospheric conditions, the turbine array would create artificial cross-turbulence across the mountain on a repeated and continuous operational basis.

Natural wind conditions on an upland mountain are already variable, but nature does not create rotating turbine-blade turbulence from multiple directions on a permanent industrial scale. This is an artificial operational effect created by the proposed development. The EIAR does not provide a reliable site-specific scientific basis to assess or exclude the effects of this continuous cross-turbulence on delicate upland peat, surface water, fog movement, humidity, vegetation, wildlife, insect life, bird flight behaviour and the microclimate of Dough Mountain.

The effects are not limited to human amenity or turbine performance. Scientific literature records that wind farms can alter local temperature and humidity, with potential consequences for soil moisture, vegetation and ecological processes. On Dough Mountain, even small changes in near-ground drying, moisture movement, wind exposure, fog, cloud interaction or evapotranspiration may be significant because upland peatland and wet heath habitats depend on stable waterlogged conditions.

This is also relevant to wildlife. Dough Mountain is part of a wider upland habitat used by protected and sensitive species including Hen Harrier, raptors, hare, upland birds, insects and other wildlife. Turbine wake turbulence, blade-tip vortices and altered wind-flow conditions may affect flight behaviour, foraging patterns, prey distribution and habitat quality. The EIAR should therefore assess not only collision risk, but also the wider ecological consequences of operating large turbines in a sensitive upland airspace above known wildlife habitat.

In my view, the EIAR is inadequate because it fails to provide a site-specific assessment of turbine-induced turbulence and microclimatic effects for this upland peat and mountain environment. The assessment should include modelling of wake behaviour over the actual Dough Mountain terrain; likely downwind wake zones under prevailing wind directions; artificial cross-turbulence from turbines positioned to the north-west, west, south and south-east; effects on near-surface temperature, humidity, fog, soil moisture and evapotranspiration; interaction with forestry edges and cleared areas; and ecological consequences for peatland habitats, protected birds and other wildlife.

In the absence of this assessment, An Bord Pleanala cannot safely conclude that the proposed development would not significantly affect the local environment, wildlife, peatland hydrology, surface-water systems or upland microclimate. The operational turbulence from fourteen 185 m turbines, reaching approximately 540 m above sea level, would not be confined to individual turbine bases or to bog at the edge of the mountain. Given the reduced Study Area, the height of Dough Mountain, the scale of the turbine array, the sensitivity of the peatland and the importance of the area for protected wildlife, the precautionary approach should apply and permission should be refused.

16A. Recharge News / Cosmo Sanderson Wind-Wake Source and Visual Evidence

I also rely on public reporting by Cosmo Sanderson in Recharge News as supporting evidence that wind-farm wakes and turbulence are recognised operational issues in the wind-energy sector. Recharge identifies Cosmo Sanderson as a journalist covering wind power and other energy-transition technologies.

Cosmo Sanderson, Recharge News, 30 September 2024, reported on wind-farm wake effects in an article titled "Staggering wake losses pose grave threat to offshore wind sector, warn experts".

The article states that "Frightening" new data shows wind wakes between offshore wind farms have been massively underestimated. The same Recharge article uses a visual image/caption describing "wind wakes trailing behind turbines".

I do not rely on the Recharge image or article as proof of the exact impact at Dough Mountain. I rely on it as supporting material showing that turbine wakes are a known and visible operational effect of wind farms and that wake behaviour can be significant enough to be reported as a serious issue within the wind industry itself.

The visual image is important because it communicates the issue in a way that words and technical tables may not. It shows that turbine wakes are not confined to turbine bases, turbine foundations or narrow construction footprints. They are an operational air-flow effect created by rotating blades and can extend downwind from turbine arrays.

This is directly relevant to Lissinagroagh. The EIAR should have assessed whether fourteen 185 m turbines around Dough Mountain would create wake turbulence, altered wind-flow conditions, changed local moisture movement, fog interaction, drying effects, vegetation impacts, bird-flight effects, insect effects and peatland microclimate impacts across the wider mountain environment.

The Recharge material should therefore be attached as an appendix item, with full acknowledgement to Recharge News and Cosmo Sanderson, and used only as supporting evidence for criticism and review of the EIAR's failure to assess wind-farm wake turbulence and microclimatic effects at Dough Mountain.

17. Full Life-Cycle Environmental Impact, Waste and Decommissioning Concerns

I object to the presentation of Lissinagroagh Wind Farm as environmentally acceptable simply because it is described as renewable energy. A wind farm is not impact-free. It is a large industrial development requiring major quantities of concrete, steel, copper, composite blade materials, cabling, access roads, hardstands, foundations, borrow pits, forestry clearance, peat disturbance, grid infrastructure, maintenance works and eventual decommissioning.

The transcript “The Dark Side of Green Energy” highlights an important issue directly relevant to this application: the environmental impact of wind energy cannot be measured only at the turbine site or only during the operational phase. The whole system must be considered, including raw material extraction, manufacturing, transport, construction, operation, maintenance, waste, recycling and decommissioning.

This is especially important for Lissinagroagh because the proposed development is not a small or low-impact project. It proposes fourteen turbines of up to 185 m, large turbine foundations, extensive internal access roads, borrow pits, crane hardstands, compounds, forestry clearance, peat disturbance and associated drainage works on and around Dough Mountain. The claimed climate benefit must therefore be balanced against the local environmental damage caused by construction, peat excavation, hydrological change, biodiversity loss, landscape impact and long-term industrialisation of the mountain.

International case studies referred to in the transcript, including copper mining, rare and specialist metals, contamination zones and turbine-blade waste, show why renewable energy

infrastructure should not be accepted uncritically as “green”. Wind turbines, substations, underground cabling and grid infrastructure require substantial materials. The applicant should be required to disclose the expected quantities of copper, steel, concrete, composite blade material, cabling and other critical materials required for the entire project, including the separate grid connection and any wider grid upgrades.

This point is also directly relevant to the design flexibility option. If the final turbine model, generator type, magnet content, material composition and blade specification are not fixed, the public and the planning authority cannot properly assess the real environmental cost of the development. The applicant should not be allowed to rely on design flexibility while avoiding a project-specific assessment of materials, waste and end-of-life obligations.

The EIAR should not be accepted unless it contains a clear, enforceable and fully funded decommissioning plan for the complete removal, recycling or disposal of turbine blades, towers, nacelles, foundations, hardstands, internal roads, cabling, compounds, substation infrastructure and grid-related infrastructure. It should also identify whether turbine foundations, hardstands, roads and underground cabling would be removed or left in the upland peat environment.

The EIAR should provide a full life-cycle assessment for this specific development, including:

- the quantity of concrete, steel, copper, cabling, composite blade material and other critical materials required;
- the source, manufacturing and transport impacts of these materials;
- the carbon cost of turbine manufacture, forestry felling, peat disturbance, road building, borrow pits, grid infrastructure and construction traffic;
- the exact turbine model, generator type, magnet content and blade composition proposed;
- the expected lifespan of turbines, blades, gearboxes, generators, transformers and major components;
- the end-of-life plan for turbine blades, composite materials and specialist metals;
- the method and location for recycling, disposal or storage of turbine and grid components;
- the financial bond or legal mechanism guaranteeing full decommissioning and site restoration;
- the cumulative life-cycle impact of the wind farm, grid connection, turbine delivery route and any wider grid upgrades.

In this case, the proposed development would industrialise an upland peat and water-sensitive landscape. It would not be acceptable for the environmental assessment to focus only on claimed operational carbon savings while excluding the wider environmental chain required to manufacture, build, operate, maintain and decommission the project.

The peat, water, habitats, wildlife, landscape and community around Kiltyclogher should not be sacrificed so that the development can be described elsewhere as clean or green. For these reasons, I submit that the EIAR has not adequately demonstrated the full environmental cost of the proposed development. Permission should be refused unless and until a complete, project-specific life-cycle, materials, waste, grid and decommissioning assessment is provided and independently examined.

18. Wind Energy Ireland Public Attitudes Monitor 2022 - Inadequacy as Evidence of Local Acceptance or Lack of Community Impact

I submit that the Wind Energy Ireland Public Attitudes Monitor, December 2022, cannot be relied upon as evidence that the proposed Lissinagroagh Wind Farm would be accepted by the local population or that towns and villages will not be affected by the wind industry.

The report was prepared for Wind Energy Ireland, which the document itself describes as the representative body for the Irish wind industry with a remit to promote wind energy. It is therefore an industry attitude survey, not an independent assessment of the social, landscape, tourism, health or community effects of this specific development.

The report measures broad attitudes to wind power in Ireland. It does not measure informed local opinion on fourteen turbines of 180 m to 185 m on Dough Mountain and adjoining uplands. It does not ask respondents about turbines of this scale, a permanent 100 m meteorological mast, upland peat excavation, forestry removal, haul roads, borrow pits, hydrology, protected habitats, Hen Harrier, tourism, cultural heritage, visual dominance, night-time aviation lighting, shadow flicker, noise, or cumulative effects with other wind farms.

The distinction between general support for wind energy and acceptance of a specific local industrial wind farm is essential. A person may support renewable energy in principle while still objecting to an inappropriate wind farm in an unsuitable landscape. The survey does not test this distinction.

The report states that 80% nationally are favourable to wind power and that 85% of rural residents are favourable to wind power. However, this is a general question about wind power in the Republic of Ireland. It cannot be translated into support for this particular proposal. When the question changes to having a wind farm in the respondent's "local area," the level of support falls to 58% nationally and 56% among rural residents. This means that a very substantial proportion of people are either opposed, neutral or not clearly in favour when the development becomes local.

The rural sample is also limited. The report refers to 333 rural interviews and identifies a margin of error for rural residents of approximately 5%, with only changes of plus or minus 6% being significant. This rural sample is not evidence of acceptance by the specific affected communities around Dough Mountain, Kiltyclogher, Glenfarne, Manorhamilton, Rossinver, Lough Melvin or the wider upland border landscape.

The report does not show that respondents had any lived experience of 185 m turbines. Many older wind farms in Ireland were built with much smaller turbines. The visual, acoustic, shadow, aviation-lighting and landscape effects of 185 m turbines on an upland ridge are not comparable to general public awareness of wind energy. The survey does not demonstrate that people understood the height, scale, turbine spacing, rotor diameter, landscape dominance or cumulative industrialisation associated with the proposed development.

The report also fails to assess the effect on towns and villages. Towns and villages do not have to be within a narrow distance band of a turbine to be affected. A wind farm of this scale can affect a community through its visual dominance over the mountain backdrop, loss of rural character, altered sense of place, reduced tourism value, impact on walking routes, river walks, heritage

tours, caravan parking areas, holiday accommodation, small-scale farming, wildlife tourism and the general attractiveness of the area.

Kiltyclogher and the surrounding communities rely on landscape, heritage, wildlife, farming, culture and tourism. Dough Mountain is not an empty industrial zone. It forms part of the setting of the village and the wider upland landscape. A national industry poll cannot lawfully or logically replace a proper local assessment of those impacts.

I therefore submit that the Wind Energy Ireland Public Attitudes Monitor should be given little or no weight in determining the acceptability of this development. It does not assess this site, this community, this turbine height, this landscape, this hydrology, this tourism economy, or this rural population. It cannot be used to suggest that the public supports the Lissinagroagh Wind Farm or that nearby towns and villages will not be affected by the wind industry.

19. Appendix 1-5 Community Engagement Report - Shortcomings as Evidence of Public Acceptance or Lack of Community Impact

I submit that Appendix 1-5, described as the Community Engagement Report, should not be treated as evidence of public acceptance or informed public opinion. It is a developer-prepared engagement report, not an independent public-opinion survey.

The proposed development is not a minor local project. It consists of fourteen industrial wind turbines with a blade tip height range of 180 m to 185 m, a permanent 100 m meteorological mast, new and upgraded access tracks, drainage works, watercourse crossings and associated infrastructure. The scale of this proposal is therefore of direct relevance not only to immediate neighbouring houses but to the wider rural population, nearby villages, tourism routes, heritage landscapes and town communities that view and use Dough Mountain and the surrounding uplands.

The report states that there was "very active and extensive community engagement" and that the project team was satisfied that it had "achieved and surpassed" its objectives. However, the figures relied on do not support such a conclusion. The report records only 41 attendees at community engagement clinics. Website visits, virtual exhibition visits, school sponsorship, brochures, media notices and engagement with elected representatives do not amount to a statistically valid public-opinion assessment. They do not show how many people support the development, how many oppose it, how many did not know about it, how many could not attend, or how many were unable to access online information.

The report also fails to assess those who were effectively excluded from meaningful participation. In a rural county, reliance on websites, local newspapers, appointment-based clinics and a limited venue can disadvantage elderly people, people with disabilities, people without transport, people without internet access, people who do not buy local newspapers, and people who live outside the immediate leaflet-drop area but who are still affected by the development.

The report itself confirms that serious concerns were raised by members of the public, including noise, low-frequency noise, health effects, hydrology, missing streams and springs, visual impact, tourism, archaeology, cultural heritage, landslides, property prices and the adequacy of

community engagement. These concerns are not peripheral. They go to the core suitability of the site and the adequacy of the Environmental Impact Assessment.

I further submit that the report does not demonstrate that the community engagement team, or the public information process, had sufficient proven experience of the real-world impact of 185 m wind turbines on small rural towns, villages and upland communities. Experience in forestry, communications, community benefit funds or general renewable-energy development is not the same as demonstrated experience of assessing how turbines of this height affect daily life, residential amenity, tourism, heritage, landscape character and community identity in a sensitive upland border area.

The Population and Human Health assessment is also too narrow. It identifies properties within 2 km and states that the study area may be extended where population centres, receptor density or local considerations require it, but for this proposal the 2 km radius was not extended. That is inadequate. The impact of fourteen 185 m turbines on Dough Mountain cannot be confined to a 2 km housing exercise. Town and village populations may be affected through landscape domination, tourism loss, cultural and heritage impacts, shadow flicker perception, night-time aviation lighting, noise concerns, loss of rural amenity, altered sense of place and the industrialisation of the mountain backdrop.

Kiltyclogher, Manorhamilton, Glenfarne and the wider surrounding population do not have to live within 2 km of a turbine to be affected by this industry. Dough Mountain is part of the visual, cultural, ecological and tourism setting of the area. The Community Engagement Report does not properly assess that wider community impact and should not be relied upon as evidence that the population has been adequately informed, consulted or unaffected.

For these reasons, I submit that the Community Engagement Report is inadequate, developer-led, non-independent and incapable of demonstrating either public acceptance or the absence of significant effects on nearby towns, villages and rural communities.

20. Photographic Evidence of Site Unsuitability

I submit that my photographs support my statement that Dough Mountain, Saddle Hill, Thur Mountain and the surrounding upland environment are not suitable for wind farm development.

The photographs show the real physical conditions on and around the proposed wind farm site, including upland bog, peat, exposed peat faces, steep slopes, water channels, forestry on peat, storm-damaged forestry, bog movement, caves, karst features, swallow holes, flash-flood channels, sensitive habitats, open mountain landscape and the wider visual setting of Kiltyclogher and Lough Melvin.

These photographs are important because they show conditions on the ground that cannot be fully understood from desk-based maps, photomontages or technical drawings. They show that the proposed development is not located in a simple commercial forestry site, but in a complex upland peat, hydrology, karst, forestry, habitat and landscape system.

The photographs also support my concern that the EIAR underestimates the practical difficulty and environmental risk of constructing fourteen 185 m turbines, a permanent 100 m

meteorological mast, access roads, crane hardstands, borrow pits, drainage works, watercourse crossings, grid infrastructure and construction compounds in this location.

In particular, the photographs support concerns regarding:

- peat instability and visible bog movement;
- exposed peat and erosion risk;
- steep upland slopes and flash-flood channels;
- high-density surface water drainage;
- caves, swallow holes and karst uncertainty;
- forestry planted on peat and storm-damaged trees;
- sensitive upland bog and heath habitat;
- protected wildlife habitat and bird use;
- visual impact on Kiltyclogher, Lough Melvin and the wider landscape;
- the unsuitability of the terrain for major industrial infrastructure.

I ask the Board to treat these photographs as direct local evidence of the receiving environment. They demonstrate that the site is environmentally sensitive, physically constrained and unsuitable in principle for an industrial wind farm of any scale.

Photographic Evidence - Curlews Feeding at Lough MacNean

Photograph C1 - Curlews feeding on a sandbank at Lough MacNean. This photograph is included as local evidence that the wider receiving environment supports sensitive bird species and that the assessment of the proposed Lissinagroagh Wind Farm should not be confined narrowly to turbine locations or the red-line site boundary.

I also rely on photographic evidence of Curlews feeding on a sandbank at Lough MacNean. This supports my concern that the receiving environment includes wider lakes, wetlands, river corridors

and feeding areas used by sensitive bird species. The EIAR should assess not only birds recorded at turbine locations, but also the wider functional landscape used by protected and vulnerable species across Lough MacNean, Lough Melvin, Dough Mountain, surrounding uplands, river corridors and associated wetland habitats.

This photograph is relevant to my objection because Lough MacNean is part of the wider ecological and hydrological context that should be considered when assessing impacts on birds, water quality, peat movement, catchment connectivity and cumulative effects. It reinforces the need for a wider, functional landscape assessment rather than a narrow turbine-footprint assessment.

21. Conclusion and Request for Refusal

For all of the reasons set out above, I ask An Bord Pleanala to refuse permission for Lissinagroagh Wind Farm.

The site is unsuitable in principle because of its upland blanket bog, peat instability risk, karst hydrology, steep slopes, high rainfall, sensitive watercourses, connection to Lough Melvin SAC, protected species, Hen Harrier nesting and foraging activity, Dough Mountain NHA context, heritage features, community impacts, tourism impacts, landscape harm, incomplete grid assessment, EirGrid route constraints regarding woodlands and bogs, the unresolved permanent mast issue and cumulative impact with Faughery Wind Farm.

The EIAR and NIS do not provide sufficient certainty that the project would avoid significant adverse effects. The absence of complete information, testing or records is not evidence of no risk. In this location, uncertainty must weigh against consent.

My photographic evidence supports this conclusion by showing the actual ground conditions, peat, slopes, water channels, forestry damage, bog movement, karst features, sensitive habitats and landscape setting which make this location unsuitable for wind farm development.

The unresolved grid capacity, export route and wider North West reinforcement position further confirms that the application is premature. The Board should not approve the wind farm first and leave the grid, route-specific environmental surveys and cumulative grid impacts to be resolved later.

The scoping defect in the soils, geology and hydrogeology assessment further supports refusal. The assessment should not have primarily focused on the wind farm site where Dough Mountain is an upland peat, karst, groundwater and surface-water source area draining towards sensitive rivers, lakes, SACs, farms, homes and cross-border waters. The failure to complete proper dye tracing and karst investigations before consent means that the full receiving environment has not been proven, surveyed or assessed.

I respectfully request that An Bord Pleanala refuse permission for the proposed Lissinagroagh Wind Farm under Main Planning Application Number PAX12.324290, including the associated Wind Farm Application Reference ACP-323048-25, Design Flexibility and 10-Year Permission Reference ACP-323910-25, and the separate Grid Connection Reference ACP-323353-25. The current wind farm, design flexibility/10-year permission and grid connection should be considered together because they form part of one overall project with connected environmental effects.

Appendix A - FOI / AIE / Correspondence Index

Ref	Document / Evidence	Why attach it
A1	IFI FOI reply, 18 February 2022, stating no site visit had yet been undertaken	Shows limited fisheries assessment and lack of early site verification
A2	IFI correspondence warning against watercourse diversion or increased flow speed	Supports hydrology and fisheries concerns
A3	Coillte AIE 20240086 response	Shows lack of Coillte bog/soil movement policy, maps or records
A4	Leitrim County Council / Bernard Greene correspondence, 5 June 2026, on project splitting	Shows official position on separate wind farm/grid processes and separate submission fees
A5	EirGrid / Connell McLoone correspondence or information request	Supports concerns about grid connection, capacity and lack of information
A6	FuturEnergy response stating it is not subject to AIE	Shows difficulty obtaining environmental information
A7	Leitrim County Council 2021 mast Further Information letter	Shows previous planning concerns and mast history
A8	Refusal of 100 m met mast application	Supports planning history and credibility concerns
A9	29 June 2022 ABP / developer withdrawal or design alteration email	Shows long project history and changing design
A10	Any EPA / IFI / NPWS / Uisce Eireann / Donegal County Council correspondence	Shows statutory body concerns or absence of full consultation
A11	2019 Kiltyclogher Heritage Centre multi-agency meeting notes, if available	Links tomb, cave, water flow and official awareness
A12	Any FOI/AIE records on turbine delivery route	Shows whether route impacts were assessed
A13	EirGrid Powering Up the North West Project Overview, September 2025, Route Options, page 10. Source: https://cms.eirgrid.ie/sites/default/files/publications/Powering-Up-the-Northwest-Project-Overview-September-2025.pdf	Shows EirGrid route constraints, including avoiding towns and villages, maximising distance from houses and avoiding environmental sensitivities such as woodlands and bogs.
A14	Correspondence or public information showing Powering Up the North West is at Stage 4 of a six-stage project	Supports the objection that the grid process is incomplete and landowner negotiations/final routing are unresolved.

Appendix B - EIAR / Planning Document Index

Ref	Document / Evidence	Why attach it
B1	EIAR project description showing 14 turbines, 185 m height and 10-year permission	Establishes scale and duration
B2	EIAR section confirming grid connection is not included / separate reference ACP-323353-25	Supports project-splitting argument
B3	EIAR / NIS hydrology section stating karst tests have not taken place	Central evidence for uncertainty
B4	EIAR geology / peat / landslide sections	Supports peat instability objection
B5	GSI landslide susceptibility map/extract	Independent evidence of ground risk
B6	EIAR drainage maps and watercourse maps	Show connection to Sraduffy, County River, Lattone River and Lough Melvin
B7	EIAR biodiversity / ornithology section confirming Hen Harrier nesting pairs	Central protected-species evidence
B8	EIAR mitigation sections for Hen Harrier habitat loss	Shows acknowledged impact
B9	Faughery Wind Farm bird surveys 2015, 2017 and 2019	Shows Hen Harrier activity in the wider Dough Mountain area
B10	Faughery carcass search / post-construction monitoring records, if available	Relevant to operational collision and displacement risk
B11	Faughery 2014 water monitoring reports and lab certificates	Shows karst features and limits of monitoring
B12	EIAR traffic chapter	Compare with actual likely heavy vehicle movements
B13	EIAR landscape and photomontage chapter	Challenge representativeness of viewpoints
B14	EIAR consultation chapter	Challenge adequacy of appointment-only Rossinver consultation
B15	EIAR cumulative impact chapter	Challenge failure to fully integrate Faughery and nearby proposals
B16	EIAR alternatives/layout evolution chapter	Shows design changes over time
B17	ACP-323910-25 design flexibility material	Supports objection to uncertain final design
B18	Leitrim County Development Plan wind energy map / grey zones	Shows turbines/borrow pits/compounds outside or near approved study areas
B19	Dough / Thur Mountains NHA Site Synopsis, Site Code 002384	Supports upland blanket bog and habitat argument
B20	Lough Melvin SAC Site Synopsis / conservation objectives	Supports downstream Natura impact argument
B21	2021 temporary 100 m meteorological mast application, Further Information request and refusal record	Shows the mast planning history and why the current permanent mast proposal must be assessed carefully.

B22	Current EIAR/planning extracts describing the permanent meteorological mast and its location	Shows that the current mast differs from the 2021 temporary mast application and must be included in cumulative assessment.
B23	EirGrid Powering Up the North West Project Overview route constraints extract	Supports the argument that bogs and woodlands are environmental sensitivities to be avoided, not treated as suitable for major wind farm infrastructure.
B25	EIAR assessment of operational turbine wake effects, turbulence, microclimate, air, peatland hydrology and biodiversity	To show whether the applicant has assessed wake turbulence, artificial cross-turbulence, microclimate, fog, humidity, soil moisture, peatland drying and ecological effects across the full Dough Mountain upland.
B26	Newsletter 1 and Newsletter 2 project material showing or referring to Dough Mountain within the wider project area	To support the point that the public understood Dough Mountain as part of the environmental setting, while the later Planning Application Study Area was reduced.
B27	Scientific research on wind turbine wake turbulence, peatland microclimate and wind-farm effects on temperature, humidity, soil moisture and carbon cycling	To support the objection that operational effects are not confined to turbine bases and require site-specific assessment on an upland peat mountain.

- An Bord Pleanala Croagh Wind Farm refusal extracts - peat, landslide, hydrology, repositories, water crossings, forestry clearance, drainage and upland bog risk pointers relevant to Lissinagroagh.
- GSI landslide susceptibility mapping and historical landslide mapping for the Lissinagroagh / Dough Mountain / Saddle Hill area.
- Peat repository, spoil management, borrow pit and access road drawings, including any retaining buttresses or engineered containment areas.
- Drainage design drawings showing all natural and man-made water channels, crossings, crossing upgrades, outfalls, settlement ponds and discharge points.
- Croagh Wind Farm and Lissinagroagh Wind Farm comparison note - planning comparison showing repeated peat, landslide, drainage, forestry clearance, spoil management, water crossing, habitat and landscape risk factors.

B25. EirGrid Powering Up the North West Project Overview, September 2025 - route status, route constraints and grid reinforcement context.

Purpose: Supports the objection that the grid/export route is not finally selected, that EirGrid seeks to avoid towns, villages, houses, woodland and bogs, and that route-specific bird, bat, watercourse, peat, hydrology, habitat, cultural heritage and traffic assessments are required before the project can be treated as complete.

B26. Renewable constraint, curtailment and grid capacity evidence from EirGrid, Wind Energy Ireland, WindEurope and relevant academic/national sources.

Purpose: Supports the objection that the application is premature because the North West grid requires reinforcement and the wind farm should not be assessed separately from the electricity export route and wider grid works needed to make it operational.

- B25 Garvagh Glebe peat slide emergency response, Forest Service correspondence and turbulence felling records.

Appendix C - Photograph and Map Index

Purpose: To support the observer's statement that the receiving environment is not suitable for wind farm development and is unsuitable in principle for an industrial wind farm of any scale.

- Photographs of visible bog slippage and exposed peat on the lower end of the upland bog adjacent to the road to Kiltyclogher.
- Photographs of steep gorges, flash flood channels, swallow holes, marsh ground, caves and borrow pits within and surrounding the Study Area.
- Photographs of Storm Eowyn and other storm-related tree fall, especially around T7 and T8.
- Panoramic view photographs showing Lough Melvin, Saddle Hill, Shenaun, Farbreague, Sligo Bay, Truskmore, Conway North, Tievebaun, Benwiskin, Gortnagarn, Lackagh Mountain, Manorhamilton, Bembo Mountain, Naweeloge Top, South Leitrim, Fawley Falls, Donegal Bay, Kinlough, Bundoran, Barnsmore Gap, the Donegal Mountains, Garrison, Belles, Glenfarne, O'Donnell's Rock, Arroo Mountain and Cuilcagh Mountain.

Ref	Document / Evidence	Why attach it
C1	Dough Mountain / Thur Mountain skyline from Kiltyclogher	Landscape and tourism impact

C2	Proposed caravan parking view facing mountain	Direct community/tourism impact
C3	Kiltyclogher Heritage Centre / Sean Mac Diarmada tour material	Heritage and tourism evidence
C4	River walk / County River / Sraduffy River photographs	Community amenity and hydrology
C5	County River flooding entering Lough Melvin, dated 30 January 2026	Flash flooding and downstream risk
C6	Sraduffy River route map	Correct hydrological pathway from Dough Mountain
C7	Lattone River / County River confluence map	Shows connection to Lough Melvin
C8	Lough Melvin SAC proximity map	Natura and fisheries impact
C9	Cave / swallow hole / fast-flowing water feature photographs	Karst and monitoring uncertainty
C10	Neolithic tomb / Tullyskeherney National Monument photographs	Heritage and landscape impact
C11	Upland bog / peat / heather photographs	Shows active upland habitat
C12	Bog cotton at Saddle Hill / T2-T3 area	Supports peatland habitat evidence
C13	Exposed peat faces / peat erosion / bog cutting photographs	Supports peat instability risk
C14	Steep slope photographs with camera held level	Shows terrain risk better than maps
C15	Water channels / ravines / flash flood channels	Supports hydrology and erosion risk
C16	Proposed T5 slope / Dough summit view	Turbine-specific terrain evidence
C17	Proposed T7, T8, T13, T14 views towards Dough/Tawnylust Barr	Turbine-specific landscape and habitat evidence
C18	Proposed T9 and T10 site photographs	Supports Hen Harrier and mast-area concerns
C19	Refused mast site / solar panels / cleared works photographs	Planning history and premature works
C20	Female Hen Harrier photograph	Protected raptor evidence
C21	Hen Harrier sighting locations map	Show use of T7/T9/T10/T13 and wider upland
C22	Hare near T6/T4	Local biodiversity evidence
C23	Whooper Swans / Buzzards / wildlife photos, if available	Tourism and biodiversity
C24	Net1 mast photograph	Telecommunications and emergency resilience
C25	ESB lines through Coillte forestry / storm damage photographs	Infrastructure resilience
C26	Narrow local roads / timber haulage photographs	Traffic and construction impact
C27	Borrow pit locations, especially near Lisdarush	Excavation, spoil and peat risk
C28	10 m contour map	Shows slope and upland terrain

C29	Study Area boundary vs townlands map	Shows excluded/edge areas
C30	Leitrim wind energy study area map	Shows relationship to County Development Plan
C31	Faughery Wind Farm and proposed Lissinagroagh overlay map	Cumulative impact
C32	Photos of Lough Melvin, Dean's Lake, Owanmore/Lough Gill if available	Downstream water sensitivity
C33	Bembo Mountain / wider border upland skyline photographs, if available	Supports wider landscape and cumulative visual impact.
C34	2021 temporary 100 m mast site photographs, including site clearance and solar panels	Shows mast planning history and previous works.
C35	Current permanent mast location map/photographs	Shows the changed location and cumulative impact with the fourteen turbines.
C36	Map showing turbines positioned north-west, west, south and south-east of Dough Mountain	To show the potential for repeated artificial cross-turbulence across the mountain under different wind directions.
C37	Dough Mountain plateau / upland peat / surface-water photographs	To show that the mountain is an extensive connected upland peat and surface-water system, not a small isolated bog edge.
C38	Views from Dough Mountain and surrounding slopes showing fog, low cloud, forestry edge, heath, water channels and exposed upland airspace	To support the need for site-specific turbulence and microclimate assessment.

- Photographs showing Dough Mountain, Saddle Hill, Thur Mountain, upland bog, exposed peat, bog movement, steep slopes, water channels, caves, karst features, forestry on peat, storm damage, wildlife habitat, turbine locations, mast location, views from Kiltyclogher, Lough Melvin and the wider landscape.
- Photograph C1 - Curlews feeding on a sandbank at Lough MacNean, showing that the wider receiving environment includes lakes, wetlands and bird feeding areas that should be assessed as part of the functional landscape and catchment context.

Appendix D - Life-Cycle, Waste and Decommissioning Evidence

- Transcript/extract: "The Dark Side of Green Energy" - relied on for the principle that renewable infrastructure should be assessed across the full system, including raw materials, manufacturing, transport, waste and decommissioning.
- Applicant material quantities schedule, if available - concrete, steel, copper, cabling, composite blade materials, foundations, hardstands and grid components.
- Decommissioning plan and financial bond/legal guarantee for turbine blades, towers, nacelles, foundations, access roads, hardstands, cabling, substations and grid-related infrastructure.
- Design flexibility details - final turbine model, generator type, magnet content, blade composition, recycling method and end-of-life destination.

- Life-cycle carbon assessment covering manufacture, transport, forestry felling, peat disturbance, road building, borrow pits, grid connection and decommissioning.

Appendix E - Wind Energy Ireland Public Attitudes Monitor Evidence

- Wind Energy Ireland Public Attitudes Monitor, December 2022 - to be attached as an industry attitude survey which should be challenged, not relied upon as proof of local acceptance.
- Marked extract showing the report is prepared for Wind Energy Ireland, the representative body for the Irish wind industry with a remit to promote wind energy.
- Marked extract showing national favourability figures, rural sample size, rural margin of error and the reduced support when the question concerns a wind farm in the respondent's local area.
- Local evidence bundle showing that the survey does not assess Kiltyclogher, Dough Mountain, Lough Melvin, tourism, heritage, 185 m turbines, the permanent 100 m mast, peat excavation, Hen Harrier, shadow flicker, night lighting, hydrology or cumulative effects.

Appendix F - Appendix 1-5 Community Engagement Report Evidence

- Appendix 1-5 Community Engagement Report - to be attached as a developer-prepared engagement report, not an independent public-opinion survey.
- Marked extract showing the report claims "very active and extensive community engagement" and that the project team considered its objectives achieved and surpassed.
- Marked extract showing only 41 attendees at community engagement clinics, with website visits, virtual exhibition visits and other developer-led communications not proving informed acceptance.
- Marked extract listing public concerns about noise, low-frequency noise, health, hydrology, missing streams and springs, visual impact, tourism, archaeology, cultural heritage, landslides, property prices and adequacy of engagement.
- Marked extract from Population and Human Health assessment showing the 2 km focus and the statement that the study area may be extended for population centres or local considerations, but was not extended for this proposal.
- Local evidence bundle showing the wider affected communities, including Kiltyclogher, Manorhamilton, Glenfarne, tourism routes, heritage sites, caravan parking area, river walks, caving and landscape views of Dough Mountain.

Appendix G - Soils, Geology, Hydrogeology, Study Area and Karst Evidence

- TOBIN scoping report, Section 7.2 Study Area - extract stating that the EIAR study area for soils, geology and hydrogeology will primarily focus on the wind farm site, with adjacent lands and downstream environs considered to an appropriate extent.
- Marked extract identifying karst features within the limestone bedrock formation, blanket peat, Dough/Thur Mountains NHA, Lough Gill SAC, Lough Melvin SAC and Northern Ireland Lough Melvin SAC as relevant receptors.
- GSI landslide susceptibility mapping showing moderate to high susceptibility in central and northern parts of the study area, together with local photographs of bog movement, exposed peat, steep slopes and flash-flood channels.
- Karst, cave, swallow hole, spring and groundwater evidence, including the Tullyskeherney cave/water feature and Faughery water monitoring material identifying a swallow hole and spring.
- Evidence that dye tracing and full karst connectivity investigations were not completed before the EIAR/NIS and mitigation conclusions were finalised.
- Purpose: To support the objection that the soils, geology and hydrogeology assessment is fundamentally deficient because the receiving environment should have been defined by hydrological, geological, peatland, karst, ecological and downstream pathways, not primarily by the wind farm site boundary.

Appendix H - Marsh Fritillary, Bird, Bat and Cumulative Effects Evidence

Include targeted Marsh Fritillary habitat/larval web survey evidence or note absence of such surveys; Faughery Wind Farm bird survey extracts from 2015, 2017 and 2019; Hen Harrier sighting records; bat survey evidence; maps showing turbines, access roads, drainage, forestry clearance, grid route, turbine delivery route and replacement forestry lands; and evidence of cumulative effects with Faughery Wind Farm, mast works, forestry operations and grid/export infrastructure.

Purpose: To show that the EIAR has not adequately assessed the full biodiversity and cumulative zone of influence, including Marsh Fritillary, Hen Harrier, bats, bird displacement, habitat fragmentation, peatland ecology and the combined effects of the wind farm, grid connection, mast, roads, borrow pits, drainage, forestry clearance and turbine delivery route.

Appendix H/X - Recharge News / Cosmo Sanderson wind-wake article and image. Source: Cosmo Sanderson, Recharge News, 30 September 2024, article on wind-farm wake effects and wake losses. Purpose: Supports the point that wind-farm wake turbulence is a recognised operational issue and that the EIAR should have provided site-specific wake, turbulence and microclimate assessment for Dough Mountain. The image should be attached with source, author and date clearly acknowledged, and used only as supporting evidence for criticism and review of the EIAR.

Suggested Attachment Bundle Order

1. Main written objection.
2. One-page summary of key refusal reasons.
3. FOI/AIE correspondence bundle.
4. EIAR extract bundle with highlighted passages.
5. Hydrology / karst / water map bundle.

Appendix I - Weather, Climate Change, Rainfall, Storm and Leitrim Risk Evidence

Sources include Met Eireann material confirming 2023 as Ireland's wettest and warmest year on record; Met Eireann Annual Climate Statement for 2025; Met Eireann Climate Statement for January 2026; Met Eireann Storm Eowyn material; EPA material on projected increases in heavy precipitation; and the County Leitrim Climate Change Risk Assessment.

Purpose: Supports the submission that the proposed wind farm is located in a climate-sensitive upland environment where high rainfall, prolonged wet periods, flash flooding, severe windstorms, forestry windthrow, peat movement, drought, fire risk, drainage failure, access disruption and changing climate baselines must be assessed with a precautionary approach.

6. Peat / landslide / geology bundle.
7. Hen Harrier / ornithology bundle.
8. Faughery Wind Farm comparison bundle.
9. Community / tourism / Kiltyclogher bundle.
10. Heritage / cave / tomb bundle.
11. Photo appendix, labelled by location and turbine number.
12. Wind Energy Ireland Public Attitudes Monitor rebuttal bundle.
13. Appendix 1-5 Community Engagement Report rebuttal bundle.
14. Soils, geology, hydrogeology, karst and dye-testing study area defect bundle.

Appendix J - Garvagh Glebe Peat Slide, Turbulence Felling and River-Risk Evidence

Documents include:

- AGEC Ltd, August 2009, Peat Slide Emergency Response Plan for Rivers at Risk from Peat Failure as a Result of Tree Felling Operations - Garvagh Glebe Wind Farm.
- Forest Service correspondence regarding Coillte GFL application for Garvagh Glebe turbulence felling.
- Forest Service / Sligo-Leitrim bog slide correspondence.
- Coillte Resource Management, Turbulence Felling for Garvagh Glebe Wind Farm, 20 April 2009.

Purpose: Supports the submission that peat slide, forestry felling, turbulence felling, water quality, river risk, soil stability, SAC/SPA/NHA screening, worker isolation, emergency rescue, pollution barriers, monitoring difficulty and cumulative effects are known and documented risks in Coillte upland wind farm forestry settings in County Leitrim. This evidence is directly relevant to the proposed Lissinagroagh Wind Farm on Dough Mountain.

Leitrim County Council Scoping Response, Site and Surrounding Area, and Grid Route Uncertainty

Leitrim County Council Scoping Response Confirms the EIAR Had to Assess the Full Receiving Environment, Peat Risk, Material Storage and Grid Infrastructure

I submit that the Leitrim County Council scoping response of 27 January 2025 is highly significant because it confirms that the applicant and its consultants were expressly warned of the matters that had to be fully assessed in the EIAR.

TOBIN's consultation email of 3 December 2024 stated that the proposed Lissinagroagh Wind Farm would involve all associated infrastructure including turbine foundations, hardstanding areas, borrow pits, access tracks, a 110 kV electrical substation and an underground grid connection. This confirms that the project being scoped was not limited to turbine bases. It included grid infrastructure, borrow pits, hardstands, access tracks and all associated infrastructure.

Leitrim County Council's response required the EIAR to include all areas that would be impacted directly or indirectly by the proposed development. The Council stated that the information in the EIAR should be based on comprehensive surveys of the area and should accurately describe the receiving environment in terms of geology, geomorphology and hydrology, as well as the physical site proposed for development.

This directly supports my objection that the EIAR cannot be treated as adequate if it mainly confines assessment to the wind farm site or defined Study Area. Dough Mountain is an upland peat, forestry, karst and hydrological source area. The receiving environment includes rivers, streams, drains, springs, swallow holes, caves, downstream catchments, Lough Melvin SAC, Lough Gill SAC, the Dough/Thur Mountains NHA, local watercourses, forestry lands, grid infrastructure and surrounding lands that may be affected directly or indirectly.

The Council also required assessment of materials storage and containment within the site. It required information on the nature, quantities and source of materials to be used, the volumes and nature of waste materials likely to be generated during construction, and the proposed means of disposal or relocation within the site boundary. This is directly relevant to the proposed borrow pits, peat/spoil movement, stone and rock fill, repository capacity, emergency stone supply, storage constraints, and the ability to contain material in an upland peat and water-sensitive environment.

In my submission, the applicant cannot meet this requirement unless it can scientifically quantify the amount of peat, bog material, saturated soil, spoil, stone, rock fill and emergency material required for the full project. If the company cannot be certain of the amount of bog and peat to be moved to the borrow pits, then it cannot scientifically quantify the effects of that movement, the capacity of the borrow pits, the stability of stored material, the drainage burden, the number of barriers required, or the risk to watercourses.

Leitrim County Council also required the EIAR to assess the vulnerability of the project to major accidents and disasters relevant to the project. This is directly relevant to peat failure, bog movement, landslide, flash flooding, karst pollution, forestry windthrow, storm damage, emergency access failure, worker isolation and pollution entering watercourses. These matters cannot be left to a general construction management plan or emergency response plan after permission is granted.

The Council specifically identified the need to assess impact on peat stability and to provide a robust geotechnical assessment of potential for peat slippage. It also required assessment of impacts on water quality, ecology, soil, hydrology, groundwater, ground conditions and geology. These are the

same issues raised by the Garvagh Glebe peat-slide material, the Croagh Wind Farm refusal, the Shass Mountain peat slide and my local photographic evidence.

The Council further noted that the GSI landslide susceptibility mapping identified the central and northern part of the study area as moderate to high in landslide susceptibility. This is a serious warning. The Council directed TOBIN to examine recent Leitrim wind farm refusals carefully in relation to landslide susceptibility, landslide history, tension cracks, rainfall, upland and sloping site conditions, the density of drainage channels, peat and spoil volumes, storage and management of material, peat depth and nature, drainage impacts, and pollution risk to waterbodies.

This means the applicant was on notice before the EIAR was finalised that landslide, peat, drainage, spoil, storage, hydrology, water quality and previous refusal issues were central matters. These were not late concerns raised only by objectors. They were expressly identified by the Planning Authority during scoping.

Leitrim County Council also referred to the 2020 Shass Mountain peat landslide and stated that, given the proximity and severity of that event, significantly robust and extensive geotechnical and hydrogeological investigations should be undertaken and documented in the EIAR, with conclusions underpinned by the precautionary principle. This strongly supports my submission that the EIAR cannot rely on narrow study-area assumptions, incomplete bog movement records, or post-consent monitoring.

In my submission, the final EIAR should be tested against the Council's scoping requirements. If the EIAR has not fully assessed all direct and indirect receiving environments, the grid connection, borrow pits, material quantities, waste volumes, peat/spoil storage, emergency risks, landslide susceptibility, hydrology, hydrogeology, drainage changes, climate impacts and cumulative effects, then it has not complied with the very matters identified by the Planning Authority at scoping stage.

The Council's scoping response supports refusal because it confirms the seriousness of the receiving environment and the level of assessment required. On the evidence now available, the EIAR has not provided the necessary certainty that this development can be constructed and operated without unacceptable risk to peat stability, watercourses, karst, downstream SACs, habitats, fisheries, local communities and the wider North Leitrim catchment.

TOBIN's Own Scoping Email Confirms Surveys Were Required at the Site and Surrounding Area

I submit that TOBIN's own scoping consultation email of 3 December 2024 is highly significant. In that email, TOBIN stated that detailed surveys and studies were being undertaken at the site and surrounding area.

This wording matters. It confirms that the applicant and its consultants understood at scoping stage that the environmental assessment could not be confined to the turbine bases, internal roads or a narrow red-line boundary. The surrounding area was part of the assessment context from the outset.

That is directly relevant to my objection. Dough Mountain is not an isolated construction platform. It is an upland peat, forestry, karst and hydrological source area connected to surrounding lands, watercourses, gorges, springs, swallow holes, caves, downstream rivers, Lough Melvin SAC, Lough Gill SAC, Dough/Thur Mountains NHA, local communities, tourism routes and cross-border catchments.

Leitrim County Council's scoping response supports this interpretation. The Council stated that the EIAR should include all areas impacted directly or indirectly by the proposed development and that the information should be based on comprehensive surveys of the area. The Council also required

the receiving environment to be accurately described in terms of geology, geomorphology and hydrology.

In my submission, this means the EIAR should be judged against the wider survey obligation that was identified at scoping stage. If the final EIAR is mainly confined to the wind farm site, selected turbine locations, or the applicant's Study Area, then it has not followed the logic of TOBIN's own consultation email or Leitrim County Council's scoping response.

This is especially serious where the risks are landscape-wide: peat movement, slope instability, karst pollution, watercourse contamination, forestry felling, borrow pit impacts, grid infrastructure, turbine delivery, downstream hydrology, cumulative effects with Faughery Wind Farm, and impacts on Lough Melvin SAC and Lough Gill SAC.

The phrase at the site and surrounding area should therefore be treated as an admission that a wider environmental assessment was required. If comprehensive field surveys were not carried out across the surrounding Dough Mountain system, including adjacent watercourses, gorges, karst features, forestry, peatland, rivers, downstream pathways and sensitive receptors, then the EIAR cannot be accepted as a comprehensive assessment of the receiving environment.

In my submission, this supports refusal. The applicant recognised that the surrounding area was relevant, Leitrim County Council required all direct and indirect receiving environments to be assessed, but the EIAR has not demonstrated the level of comprehensive, site-and-surrounding-area assessment required for a development of this scale and risk.

Grid Connection Identified, but No Clear Statement that Surveys Extended to the Full Grid Route

I submit that TOBIN's scoping consultation email creates a serious uncertainty regarding the grid connection.

The email states that the project would involve the wind farm and all associated infrastructure, including turbine foundations, hardstanding areas, borrow pits, access tracks, a 110 kV electrical substation and an underground grid connection. However, when the email refers to detailed surveys and studies, it states that these were being undertaken at the site and surrounding area. It does not clearly state that detailed surveys and studies were being undertaken along the full underground grid connection route.

This distinction is important. A grid connection is not a minor or optional element. It is essential infrastructure without which the wind farm cannot operate. If the grid connection was part of the project being scoped, then it should have been assessed as part of the same complete project, including ecology, hydrology, peat, watercourses, roads, traffic, landowners, cultural heritage, habitats, invasive species, construction impacts and cumulative effects.

The phrase at the site and surrounding area does not, by itself, prove that the full grid route was included in the environmental survey work. It could refer only to the wind farm site and immediately surrounding lands. If the grid route was not fixed, surveyed and assessed at that time, then the public, prescribed bodies and planning authority were not being given the full environmental picture.

This is particularly serious because Leitrim County Council's scoping response required the EIAR to include all areas that would be impacted directly or indirectly by the proposed development and to be based on comprehensive surveys of the area. If the grid connection is associated infrastructure, then lands along the grid route are directly or indirectly impacted areas and should not be excluded from the main environmental assessment.

In my submission, the applicant cannot rely on the grid connection when describing the project, but then fail to clearly demonstrate that the full grid route was surveyed and assessed as part of the EIAR. That would fragment the project and prevent a complete assessment of the real environmental effects.

This supports my objection that the EIAR is incomplete. The wind farm, substation and underground grid connection should be assessed as one complete project. If the surveys were limited to the wind farm site and surrounding area, without full grid-route assessment, then the EIAR cannot be accepted as comprehensive and permission should be refused.

Grid Connection Mentioned by TOBIN but Not Clearly Scoped by Leitrim County Council

I submit that there is a serious uncertainty in the scoping process regarding the underground grid connection.

TOBIN's consultation email of 3 December 2024 stated that the proposed development would include all associated infrastructure, including turbine foundations, hardstanding areas, borrow pits, access tracks, a 110 kV electrical substation and an underground grid connection. However, the same email stated that detailed surveys and studies were being undertaken at the site and surrounding area. It did not clearly state that surveys were being undertaken along the full extended grid route.

Leitrim County Council's scoping response required the EIAR to include all areas directly or indirectly impacted by the proposed development and to be based on comprehensive surveys of the area. It also required accurate description of the receiving environment in terms of geology, geomorphology and hydrology. However, the Council's response does not appear to specifically address the extended grid route as a separate linear project with its own landowners, watercourses, roads, habitats, ecology, archaeology, construction impacts and cumulative effects.

This is important because the grid connection is essential infrastructure. The wind farm cannot operate without it. It is therefore not a minor secondary matter. If the underground grid route was part of the project being scoped, then it should have been clearly identified, mapped, surveyed and assessed as part of the complete project.

The absence of clear reference to the extended grid route in the Council's scoping response suggests that the consultation may not have presented, or at least did not result in, a full route-specific scoping assessment of the grid connection. That means prescribed bodies, landowners and the public may not have been asked to consider the full environmental footprint of the project at scoping stage.

This reinforces my objection to project splitting. The applicant cannot describe the grid connection as associated infrastructure when introducing the project, but then proceed in a way that leaves the full grid route outside the clear scope of the main EIAR. If the grid route was not fixed, surveyed and assessed with the wind farm, then the EIAR does not assess one complete project.

The issue is not merely procedural. A grid route can affect watercourses, roadside drains, peat, hedgerows, trees, habitats, protected species, private wells, fisheries, archaeology, traffic, road safety, communities and cumulative construction impacts. If the full route has not been environmentally assessed with the wind farm, the Board cannot know the total effects of the development.

In my submission, this is a fundamental defect. The scoping material identifies an underground grid connection, but the available correspondence does not show that the extended grid route was fully scoped, fixed, surveyed or assessed as part of the same EIAR. Permission should not be granted for a wind farm where an essential part of the project remains environmentally uncertain.

Appendix K - TOBIN and Leitrim County Council Scoping Correspondence

Documents: TOBIN consultation email of 3 December 2024 to Leitrim County Council and Roads, and Leitrim County Council response to Request for Scoping, dated 27 January 2025.

Purpose: Supports the submission that the project was scoped as including turbine foundations, hardstands, borrow pits, access tracks, a 110 kV substation and an underground grid connection; that detailed surveys were described as taking place at the site and surrounding area; and that Leitrim County Council required all directly and indirectly impacted areas, comprehensive surveys, geology, geomorphology, hydrology, materials storage and containment, peat stability, landslide susceptibility, hydrology and hydrogeology to be assessed. It also supports the submission that the available correspondence does not clearly demonstrate full route-specific scoping of the extended grid connection.

Additional Evidence: AIE/FOI Correspondence, Community Engagement and 2021 Mast Further Information

The following additional section should be read with the earlier sections on project splitting, scoping, public participation, peat stability, hydrology, karst, protected birds and the suitability of Dough Mountain. It relies on correspondence and records obtained through AIE/FOI and on Leitrim County Council correspondence relating to the 2021 temporary 100 m meteorological mast application P.21/110.

Community Engagement - Leitrim County Council AIE 11/26, Item 28

I submit that the inadequacy of community engagement is confirmed by information released to me by Leitrim County Council under AIE 11/26, in its reply dated 9 June 2026. The relevant document is Item 28, which contains Leitrim County Council's response/submission on the proposed Lissinagroagh Wind Farm.

Under Section 7: Community and Public Engagement, Leitrim County Council stated: "Meaningful consultation with local stakeholders is essential to ensure transparency and address community concerns about the project's potential impacts."

Leitrim County Council further requested: "We encourage the implementation of a robust consultation process that includes workshops, public forums and transparent reporting of feedback from local communities and landowners."

This is important because it shows that the Planning Authority itself identified the need for meaningful consultation, workshops, public forums, and transparent reporting of feedback from local communities and landowners.

In my submission, that standard was not met. The consultation process for this development was limited, developer-controlled and did not provide the affected communities with a full, open and transparent opportunity to discuss the wind farm, grid connection, turbine delivery route, borrow pits, peat stability, water risks, karst, landscape impacts, tourism, roads, local homes, farming, heritage and cumulative effects.

The AIE 11/26 Item 28 material is therefore directly relevant. It confirms that meaningful engagement was not optional. It was identified by Leitrim County Council as necessary to ensure transparency and to address community concerns about the project's potential impacts.

This strengthens my objection because the developer has not demonstrated that it carried out the robust consultation process requested by the Council, including public forums, workshops and transparent reporting of feedback. That failure undermines public participation and means important local knowledge may not have been properly gathered or assessed.

2021 Temporary 100 m Mast Application P.21/110 - Further Information Request

I submit that the Further Information request issued by Leitrim County Council on 9 July 2021 in respect of planning application P.21/110 is directly relevant to the present Lissinagroagh Wind Farm application.

That application concerned a temporary 100 m meteorological mast at Boleyboy, Co. Leitrim. It was not an application for fourteen 185 m turbines, borrow pits, access roads, hardstandings, peat excavation, grid infrastructure or major wind farm construction. Yet even for that smaller preliminary mast proposal, Leitrim County Council considered it necessary to request Further Information to allow proper assessment of the proposed development. The Council's letter stated that the further information requested was essential for a full and proper evaluation of the submitted planning application.

The Council requested further consideration of the impact of the proposed development on bird species including Peregrine Falcon and Chough, identified within the Sligo/Leitrim Uplands SPA. The Council accepted that the SPA was more than 11 km west of the proposed mast site and that there were no ordinary hydrological, physical or ecological pathways for direct or indirect effects. However, the Council correctly noted that these are not waterbirds and fly through the air. On that basis, the Council did not accept that the conclusion in the Appropriate Assessment Screening Statement was sufficiently precise and definitive.

This is extremely important for the present wind farm application. It shows that Leitrim County Council had already identified that protected bird species cannot be dismissed simply because a designated site is some distance away or because there is no water pathway. Birds move through the air and can be affected by tall structures, turbine collision risk, displacement, disturbance, habitat loss and barrier effects.

The Council also noted that Coillte's own newsletter for the proposed wind farm specifically mentioned Hen Harrier, a bird of prey, within the study area of the proposed wind farm development. The Council therefore requested a more thorough and detailed assessment of the proposed development on all bird species afforded protection under the Habitats Directive, to allow the Planning Authority to make a definitive determination from an Appropriate Assessment perspective.

The Planning Authority also requested clarification of the details and specifications of the proposed meteorological mast, noting that the submitted drawing referred only to a "typical meteorological mast". This is significant because the current wind farm application also relies on technical descriptions, layout drawings, turbine specifications, design flexibility and future construction detail. Where a structure is proposed, the Planning Authority is entitled to require precise details, not generic or typical descriptions.

The Planning Authority further stated that the submitted documentation had not adequately considered the ground conditions of the proposed meteorological mast. The Council noted that the documentation indicated that ground conditions would be confirmed before construction commenced. Having regard to the setting of the proposal in an area of upland bog, and in light of recent events at Shass Mountain, the Council stated that this was unacceptable. The Council therefore requested that ground conditions be adequately investigated to ensure that there was no danger of bog slippage, and that a report of such investigations, prepared by a suitably competent professional, be submitted to the Planning Authority.

Leitrim County Council also stated that it had received a significant number of submissions on the proposed mast application and invited the applicant to comment on those submissions so that an informed final assessment could be made. This shows that public submissions and local concerns were material to the planning assessment even for a temporary mast. For the current wind farm, meaningful public participation is even more essential.

Study Area, Protected Birds and Appropriate Assessment Defect

I submit that the 2021 Further Information request is highly relevant because Leitrim County Council had already identified bird, Appropriate Assessment, upland bog and ground-condition issues at the early-stage wind farm study area. The Planning Authority was not dealing with an abstract or unknown location. It had before it the mast application connected to the proposed Lissinagroagh / Dough Mountain wind farm project and was therefore aware of the general study area being promoted by Coillte/FuturEnergy at that time.

That earlier study area is important because it does not appear to be the same as the Study Area examined in the current planning application. The developer cannot use one study area for early-stage project promotion, newsletters, mast assessment and scoping, and then rely on a reduced or altered study area in the planning application if that change removes or weakens assessment of sensitive bird, peat, hydrology, karst, NHA or surrounding-environment issues.

The EIAR should clearly explain how the original study area, the mast-related study area, the scoping study area and the final EIAR Study Area relate to each other. If they differ, the EIAR should explain why, what was excluded, and whether any excluded areas contain sensitive receptors, protected bird records, hydrological features, bog, karst, watercourses or other relevant ecological information.

The 2021 Further Information request specifically raised protected bird species and required a more thorough and detailed assessment of the proposed development on all bird species afforded protection under the Habitats Directive, so that the Planning Authority could make a definitive determination from an Appropriate Assessment perspective. The Council did not ask only for a narrow review of Peregrine Falcon and Chough. It widened the issue to all protected bird species relevant to the project and expressly linked this to Appropriate Assessment.

In my submission, the EIAR and bird surveys should therefore be tested against the Council's 2021 requirement. The question is not simply whether the applicant carried out bird surveys. The question is whether the surveys and assessment properly answered the specific concern raised by the Planning Authority: whether all relevant protected bird species, including birds moving through the air from wider protected upland areas, were assessed in a way that allowed a precise and definitive Appropriate Assessment conclusion.

The bird survey should therefore explain how it addressed the Council's 2021 concerns regarding Peregrine Falcon and Chough; how it assessed birds moving through the air from the Sligo/Leitrim Uplands SPA and wider upland landscape; how it dealt with Coillte's own reference to Hen Harrier within the study area; whether the same study area referred to in 2021 was used in the final bird assessment; whether any part of the original or surrounding study area was later excluded from the planning application assessment; whether all relevant protected bird species were assessed; whether collision risk, displacement, disturbance, habitat loss, barrier effects and cumulative effects were considered; and whether the final Appropriate Assessment conclusion is genuinely precise and definitive.

If the final bird survey did not directly address the Planning Authority's 2021 concerns, then the EIAR has a serious weakness. The applicant was on notice from 2021 that bird movement through the air,

not just hydrological or physical pathways, had to be assessed. It was also on notice that Hen Harrier was already identified within the study area from Coillte's own project material.

This supports refusal because the applicant has not demonstrated that it properly addressed concerns raised by Leitrim County Council as far back as 2021 regarding the study area, protected bird species, Hen Harrier, airspace movement and the need for a precise and definitive Appropriate Assessment conclusion.

Repeated Defect: Ground Conditions and Karst Studies Deferred Until After Consent

I submit that the 2021 correspondence on planning application P.21/110 is directly relevant to the present Lissinagroagh Wind Farm application because it shows that Leitrim County Council had already rejected the practice of deferring critical ground investigations until after consent.

In the 2021 temporary 100 m meteorological mast application, the Planning Authority noted that the submitted documentation had not properly considered the ground conditions for the proposed mast. The Council further noted that the information indicated ground conditions would be confirmed before construction commenced. Having regard to the siting of the proposal in an area of upland bog, and having regard to the recent events at Shass Mountain, the Planning Authority stated that this approach was unacceptable.

This is a crucial planning point. Leitrim County Council did not accept that ground conditions could be left to be confirmed after permission, even for a temporary 100 m mast. The Council required the applicant to adequately investigate the ground conditions in advance, to ensure that there was no danger of bog slippage, and to submit a report by a suitably competent professional before the planning application could be properly assessed.

In my submission, TOBIN and the applicant have repeated the same defective approach in the current planning application for the fourteen-turbine wind farm. The current application is far larger, more permanent and more environmentally risky than a temporary mast. It involves fourteen turbines up to 185 m high, turbine foundations, crane hardstands, access roads, borrow pits, drainage works, forestry felling, peat excavation, spoil management, a permanent 100 m mast, a substation, grid infrastructure and construction across an upland peat, forestry, karst and hydrological source area.

The same principle applies with even greater force to the karst issue. The applicant cannot state or imply that critical karst studies, dye tracing, groundwater connectivity investigations, or final ground-condition confirmation can be completed after planning permission. These matters go to the heart of whether the proposed development is environmentally acceptable at all.

Karst is not a minor construction detail. It determines whether pollutants, concrete washout, hydrocarbons, sediment, peat-contaminated water or disturbed drainage could enter underground pathways and travel rapidly towards springs, streams, rivers, wells, Lough Melvin SAC or other sensitive waters. If karst connectivity is unknown, the Board cannot safely assess hydrology, hydrogeology, Appropriate Assessment, pollution risk, mitigation, emergency response or downstream effects.

The Planning Authority's 2021 position is therefore highly important. If it was unacceptable to confirm ground conditions only before construction for a temporary 100 m mast in upland bog, then it is plainly unacceptable to defer karst studies or essential ground investigations until after permission for a fourteen-turbine wind farm.

This is not just a technical omission. It affects the legal and scientific basis of the EIAR and Appropriate Assessment. The Board must be able to assess the real effects of the project before

consent is granted. It cannot grant permission first and allow the applicant to discover later whether the ground, peat, bog, karst and hydrological system can safely accommodate the development.

The 2021 mast correspondence shows that the applicant and its consultants were on notice from an early stage that upland bog ground conditions, bog slippage and Shass Mountain were central concerns. They were also on notice that post-consent confirmation of ground conditions was not acceptable to Leitrim County Council.

In my submission, the current application has not learned from that warning. It repeats the same flaw on a much larger scale by leaving critical karst and ground-condition certainty unresolved. This is especially serious because the proposed turbines, borrow pits, roads and hardstands are located in a landscape of upland bog, steep slopes, watercourses, caves, swallow holes, karst features and downstream protected waters.

The conclusion is clear. The EIAR cannot rely on later studies, later confirmation, later construction-stage investigation or later mitigation to answer fundamental questions about ground conditions, karst connectivity, bog slippage and water pollution risk. These matters had to be investigated and resolved before permission was sought. This supports refusal.

Published Scientific Evidence on Irish Peat Landslides, Forestry, Wind Farm Roads and Watercourse Pollution

I submit that the paper by Dykes (2022), 'Landslide investigations during pandemic restrictions: initial assessment of recent peat landslides in Ireland', is directly relevant to the proposed Lissinagroagh Wind Farm.

This paper confirms that peat landslides, including bogflows and bog slides, are recognised phenomena in Ireland, particularly in upland blanket peat landscapes. It records that several peat landslides occurred in 2020, including a bogflow at a wind farm, and that forestry operations probably contributed to two of the landslides.

The relevance to Dough Mountain is clear. The proposed development is located in an upland blanket peat, forestry, watercourse, karst and slope-risk environment. It involves turbine foundations, crane hardstands, borrow pits, roads, drainage works, tree felling, storage of materials, movement of peat and spoil, and construction traffic across sensitive ground. These are the same types of landscape and disturbance factors that make peat failure risk a serious planning issue.

Dykes records the 2020 Boleybrack Mountain / Shass Mountain bogflow in County Leitrim. That event occurred in upland blanket bog influenced by commercial forestry and rainfall. This is important because Leitrim County Council specifically referred to Shass Mountain when it stated in 2021 that it was unacceptable to leave ground-condition confirmation until before construction for the temporary 100 m mast in upland bog.

Dykes also records the Meenbog Wind Farm bogflow in County Donegal. This is particularly important because the paper states that the failure appears likely to have been associated with construction of a new access road. The paper also notes that turbine-base construction was not directly relevant because there were no turbines within 300 m of the landslide source area. This supports my submission that peat failure risk is not confined to turbine foundations. Access roads, floating roads, drainage, forestry, storage, loading and construction sequencing can also trigger or contribute to peat instability.

This is highly relevant to Lissinagroagh because the proposal includes extensive access roads, hardstands, borrow pits, drainage works and construction traffic across upland peat and forestry. The risk cannot be assessed only by looking at individual turbine bases. The entire construction

system must be assessed, including roads, turning areas, storage areas, emergency stone supply, material loading, drainage changes and watercourse pathways.

The paper also supports my concern that peat failure can pollute watercourses many kilometres downstream. This is directly relevant to the connected water system below Dough Mountain, including underground water, groundwater, karst pathways, springs, swallow holes, caves, the Lattone River, County River, Dooard River SAC, Sraduffy River, Lough Melvin SAC, Owenmore River, Lough Gill SAC, Glenfarne River and Lough MacNean.

In my submission, this scientific evidence reinforces the precautionary case for refusal. The proposed development is located in the type of upland blanket peat and forestry environment where peat failures are known to occur. The development would add roads, drainage, borrow pits, excavations, heavy materials and construction disturbance to that environment. The EIAR cannot rely on general mitigation or post-consent investigation where published evidence shows that peat failure can be triggered by construction activity, forestry influence, drainage changes and rainfall, and can cause serious downstream pollution.

This paper should be included in the technical evidence bundle as Appendix L - Dykes (2022), Peat Landslide Investigations in Ireland.

Evidence Bundle and Appendices Still Required for Final Lodgement

This written observation should be lodged together with an evidence bundle. The body of the observation refers to photographs, FOI/AIE records, scoping correspondence, Leitrim County Council correspondence, planning history, Garvagh Glebe peat-slide records, Croagh Wind Farm Inspector evidence, watercourse evidence and local photographic evidence. These should be submitted as separate appendices or as a combined evidence PDF, with each item clearly numbered and named.

The written draft does not automatically contain every photograph, FOI or AIE record discussed in ChatGPT unless those items are physically inserted into the document or attached as an appendix. To complete the entire submission, the main observation should be accompanied by a numbered evidence schedule and the supporting files should be uploaded or printed with matching appendix numbers.

Recommended structure: Volume 1 - Main Observation; Volume 2 - Photographs and Maps; Volume 3 - FOI/AIE Correspondence and Planning Records; Volume 4 - Technical Reports and Case Studies; Volume 5 - Community, Tourism and Local Evidence. Each photograph or record should have a short caption explaining what it shows, where it was taken or obtained, and why it is relevant.

Additional Grounds - Dough Mountain NHA, Hen Harrier Compensation and Corralled Water Risk

Habitat Compensation, Legal Uncertainty and Failure to Avoid Effective Loss of Hen Harrier

I submit that the applicant's proposed habitat compensation strategy is one of the weakest parts of the entire Lissinagroagh Wind Farm application. It does not overcome the ecological objection. On the contrary, it confirms that the proposed development is predicted to cause serious harm to an established Hen Harrier breeding and foraging landscape.

The applicant's own Outline Biodiversity Management Plan contains a major admission. It states that the Ornithology Chapter of the EIAR concludes that breeding Hen Harriers are likely to be disturbed by the Proposed Project, leading to potential displacement from nesting and foraging areas and possibly resulting in the effective loss of the species from the site. It further states that, in the absence of mitigation, disturbance is predicted during both construction and operational phases, particularly due to the presence of operating wind turbines.

This is not a minor or theoretical impact. It is an admission that the proposed wind farm may remove Hen Harrier from a landscape that the applicant's own surveys show they have repeatedly used. The OBMP records that bird surveys from 2020 to 2025 consistently recorded one to two nesting Hen Harrier within the site and/or surrounding area, including a northern and southern pair. It also records that the southern pair attempted to nest annually between 2020 and 2025 and used a corridor approximately 2.5 km in length, shifting nest locations within that area.

This confirms that the proposed wind farm site and surrounding Dough Mountain, Saddle Hill, Faughery, Killea, Boleyboy and wider upland landscape are not marginal or occasional Hen Harrier habitat. They are part of a repeated, multi-year breeding and foraging territory.

The OBMP also accepts that current guidance recommends a disturbance-free buffer of up to 750 metres around nesting sites to avoid impacts, and that nesting locations are likely to shift over the lifetime of the wind farm due to forestry cycles. It further states that a single breeding pair of Hen Harrier is considered of national importance.

These admissions should lead to refusal. If Hen Harrier require disturbance-free buffers, if their nest locations shift, and if even one breeding pair is nationally important, then it is not acceptable to place fourteen large turbines, roads, borrow pits, compounds, drainage works, forestry clearance and operational turbine disturbance into the same landscape.

The applicant estimates that 109 hectares of currently suitable Hen Harrier foraging habitat may be lost due to displacement. When future forestry cycles are considered, the estimated loss rises to 140 hectares over the lifetime of the project, including approximately 76 hectares of higher-suitability habitat and 64 hectares of lower-suitability habitat.

This is a very substantial predicted loss. The applicant is not showing that there will be no meaningful effect. It is accepting that a large area of functioning Hen Harrier foraging habitat may be effectively lost and then proposing compensation to try to offset that loss.

I submit that this approach is wrong. Compensation is not avoidance. The existing habitat is already functioning. It is isolated, lightly disturbed, connected to Dough Mountain, connected to extensive upland bog, forestry edge, rough grassland and watercourses. Hen Harrier are already using it because it works. The planning authority should not permit the applicant to damage or displace this proven habitat and then attempt to recreate or encourage replacement use elsewhere.

The company's proposal to move habitat function approximately 700 metres away, including onto farming land not owned by Coillte, is not ecologically certain. Farming land has different disturbance levels, different management pressures, different ownership, different future land-use risks and different enforcement problems. A managed compensation field or farm plan cannot be assumed to replace an established upland breeding territory.

The OBMP itself recognises that compensation is uncertain. It states that compensation measures must support two pairs of Hen Harrier because a maximum of two pairs has been recorded breeding within the site over the last five years. It also states that compensation habitats must be located to maximise the chances that they will be used by Hen Harrier, that habitat types must be proven to be used by the species, that deliverability and landowner agreements must be demonstrated, and that most habitats take time to establish, sometimes several years. It also states that compensation areas need to be available at the time the existing habitats are lost.

This wording exposes the weakness of the plan. The applicant cannot guarantee that Hen Harrier will use the proposed replacement lands. It can only try to maximise the chances. Hen Harrier are wild birds. They may return to the existing Dough Mountain, Saddle Hill, Faughery, Killea or Boleyboy territories because those areas are already proven habitat.

The application also fails to answer a fundamental operational question: will the company stop the turbines if Hen Harrier return to their original nesting or foraging sites? If the answer is yes, the application must identify the shutdown trigger, the buffer distance, the breeding-season period, the decision-maker, the enforcement body, and whether the shutdown would apply for the full operational life of the wind farm. If the answer is no, then the compensation scheme cannot protect Hen Harrier from displacement, disturbance or collision risk.

The legal control over the proposed compensation lands is also uncertain. The applicant refers to legal agreements with landowners, but the public has not been shown who the contracts are between, whether they bind future owners, whether they are registered on the land folio, whether they survive sale, lease, inheritance or transfer, whether payments are index-linked for 30 to 35 years, or who enforces a breach if farming practice changes.

Only statutory protection can provide proper long-term legal certainty for biodiversity land. A developer, landowner or forestry company can call land a biodiversity area, but that is not the same as an NHA, SAC, SPA or other statutory conservation designation. This weakness is already proven locally. Coillte identified six biodiversity areas without proper public or statutory protection, and those areas are now within the proposed wind farm site. This shows that private or internal biodiversity commitments can be overridden or absorbed into later development proposals.

There is also a serious EIAR issue. If the compensation lands are part of the environmental case for permission, then those lands must be assessed as part of the EIAR and Appropriate Assessment. Their current habitats, hydrology, drainage, farming practices, peat condition, species use, land ownership and long-term management risks should be before the public now. It is not adequate to say that detailed Farm Plans or a final Biodiversity Management Plan will be prepared after consent.

The weakness is made even more serious by the proposed borrow pit and construction traffic near Hen Harrier habitat close to T8. The risk to Hen Harrier is not only from the operating turbines. The construction phase itself would involve roads, borrow pits, excavation, machinery, stone extraction, loading, vehicle movements, personnel, noise, dust, vibration, drainage works and repeated disturbance. If a borrow pit is close to the Hen Harrier nesting or foraging area near T8, and if construction traffic will use the same road, the disturbance would be direct, repeated and foreseeable.

The applicant's compensation strategy should therefore be treated as evidence that the proposed turbine layout is fundamentally unsuitable. If the project requires the displacement of a nationally important Annex I raptor from an established breeding and foraging landscape, and then relies on uncertain future compensation on privately managed lands, the correct planning response is not to condition or modify the proposal. The correct response is to refuse permission because the impact should be avoided at source.

Dough Mountain NHA Site Synopsis - Blanket Bog, Heath, Streams, Flushes and Peat Stability Risk

I submit that the Dough Mountain Natural Heritage Area Site Synopsis is directly relevant to the proposed Lissinagroagh Wind Farm and strongly supports refusal.

The Site Synopsis describes the southern side of Dough Mountain as steeper and more exposed, supporting more heath vegetation with exposed rock. It states that the intact blanket bog supports a good heath and moss cover, with peat depths of up to 2 metres. This is highly relevant because the proposed development is not located in a stable, low-risk industrial landscape. It is located within and beside an upland peat, heath, forestry and hydrological system.

The Site Synopsis also records that swards of upland grassland occur on the lower slopes and as patches within the heath and blanket bog mosaic. It states that these areas feature many narrow streams and flushed channels, characterised by rushes, grasses and frequent Heath Spotted-orchid. This confirms that the site is hydrologically sensitive and that water movement across the mountain is part of the ecological value of the area.

This directly supports my concern that turbines, access roads, borrow pits, hardstandings, drainage works, forestry felling, cable trenches, storage areas and construction traffic could interfere with the natural water system of Dough Mountain. The hydrology is not separate from the habitat. The streams, flushed channels, wet cutover areas, bog mosses, heather, cotton grasses and peat are part of one connected upland system.

The Site Synopsis also records very wet regenerating cutover areas on the margins of the site, with good cover of Ling Heather, Purple Moor-grass, cotton grasses and carpets of bog mosses. This is important because it shows that even previously disturbed peat areas can remain wet, sensitive and capable of regeneration. Such areas should not be treated as suitable for further industrial disturbance.

The Site Synopsis identifies Red Data Book species within the site, including Irish Hare, Common Frog and Red Grouse. This confirms that the area has recognised biodiversity value beyond individual habitats. It supports my objection that the EIAR should assess the wider ecological system, including species, habitats, watercourses, peatland condition, forestry edge, heath, grassland and connected upland areas.

The Site Synopsis also states that current land use on the site consists of sheep grazing, and that adjacent land uses include extensive conifer afforestation, peat cutting and grazing. It records that these activities have already resulted in habitat loss and damage to the hydrological condition of the site. This is highly significant. The correct response should be protection, restoration and sensitive management - not the addition of fourteen 185 m turbines, access roads, borrow pits, hardstandings, drainage works and permanent infrastructure.

Most importantly, the Site Synopsis specifically warns about wind energy development. It states that Dough Mountain may be under consideration for wind energy development, and that the placement of access road networks and turbine foundations associated with such developments causes habitat loss and disturbance and can destabilise the peat and lead to erosion.

This is a direct warning. It identifies the exact type of development now proposed and the exact risks now raised in this objection: habitat loss, disturbance, peat destabilisation and erosion.

The Site Synopsis further states that Dough Mountain NHA is of considerable conservation significance. It contains an extensive area of upland blanket bog with associated upland heath and grasslands. It describes blanket bog as a globally scarce resource. The current area of intact upland blanket bog in Ireland represents only a fraction of the original resource due to afforestation and overgrazing, and intact examples are therefore extremely valuable for nature conservation. Their long-term survival requires sensitive management.

In my submission, the proposed Lissinagroagh Wind Farm is the opposite of sensitive management. It would introduce major industrial infrastructure into and beside a vulnerable upland blanket bog and heath system already identified as sensitive to wind energy development. The applicant has not demonstrated that fourteen 185 m turbines and associated infrastructure can be reconciled with the conservation significance, hydrological sensitivity, peat stability risk and restoration needs of Dough Mountain NHA.

T5, T13 and T14 - Narrow Streams, Flushed Channels and Corralled Water Risk

I submit that the proposed locations of T5, T13 and T14 are especially unsuitable because planning permission is being sought to build major turbine infrastructure in areas associated with steep upland ground, forestry, narrow streams, flushed channels, peat, bog vegetation and natural water movement from Dough Mountain.

The Site Synopsis describes areas of Dough Mountain with many narrow streams and flushed channels, characterised by rushes, grasses and Heath Spotted-orchid. These are not dry or insignificant landscape features. They are part of the living hydrological system of the upland bog, heath and grassland mosaic.

T5, T13 and T14 must therefore be assessed not simply as turbine points on a map, but as major industrial structures proposed within a sensitive upland water and peat system. Turbine foundations, hardstandings, access tracks, drainage works, felling, stone placement, culverts, cable trenches, storage areas and construction traffic would all interfere with the natural movement of water through these narrow streams, flushed channels, forestry drains and seepage routes.

My concern is that the proposed works at T5, T13 and T14 could corral water into confined spaces, instead of allowing water to spread naturally through the bog, flushes, forestry ground and narrow channels. This could increase the force of water on the surrounding bog, raise pressure within the peat, create erosion points, and contribute to peat instability or bog slippage.

By placing turbine foundations, hardstands, access tracks, drains, culverts and stone infrastructure in areas of narrow streams, flushed channels and sensitive sloping forestry ground, the development could corral natural water movement into confined artificial routes. This would increase the force of water against the surrounding bog and embankments, potentially destabilising peat, accelerating erosion and increasing the risk of bog movement downslope from Dough Mountain.

That increased force is important. In an upland blanket bog, water pressure is not a minor issue. Concentrated water can erode peat, undercut channels, increase saturation, destabilise banks, create new flow paths, increase pore-water pressure and weaken the surrounding bog structure. Where water is confined by roads, hardstands, foundations or drains, the surrounding peat may be placed under greater pressure than existed naturally.

This is especially serious because T13 and T14 are in isolated and sensitive locations near watercourses, while T5 is located on sensitive sloping ground associated with Dough Mountain and forestry. If natural flushes, seepage routes, forestry drains and narrow streams are altered, blocked,

culverted or redirected, the effect could be to place more pressure on adjacent bog, embankments and downstream channels. The development could therefore increase the risk of erosion, peat movement, bog slippage and pollution of connected waters.

The risk is not only during construction. Once turbine foundations, hardstands, roads and drains are installed, they become long-term artificial features within the upland hydrological system. They may continue to redirect and concentrate water for the operational lifetime of the wind farm. This could alter the hydrological condition of the bog for decades.

The Dough Mountain NHA Site Synopsis is directly relevant because it states that access road networks and turbine foundations associated with wind energy development can cause habitat loss and disturbance, destabilise peat and lead to erosion. That is exactly the risk at T13 and T14. The proposed works would not merely sit beside the bog system; they would interfere with the water movement that supports the bog system.

In my submission, the EIAR has not demonstrated that T5, T13 and T14 can be constructed without damaging narrow streams, flushed channels, wet bog vegetation, forestry seepage routes, peat stability and downstream water quality. The applicant must prove how natural water movement will be maintained, how water will not be corralled into confined spaces, how peat will not be destabilised, how flushes will not be drained or blocked, and how erosion will be avoided over the full lifetime of the development.

If this cannot be proven with certainty before permission is granted, the precautionary conclusion is refusal. T5, T13 and T14 are proposed in the wrong locations, in a hydrologically sensitive upland bog, forestry and flush-channel system where construction could increase water force, destabilise peat and damage the very habitat features for which Dough Mountain is recognised as being of conservation significance.

Appendix B - Schedule of Information Completeness, Townlands and Planning Information

I submit that Appendix B, Schedule of Information Completeness, should not be treated as proof that the planning application is complete in substance or environmentally adequate.

The Schedule states that it seeks to provide details to facilitate An Coimisiun Pleanala in undertaking the Completeness Check required by Section 37JA of the Planning and Development Act 2000, as amended, in order to process the application. It also states that it shall not be construed as comprising an assessment of the application documentation or a consideration of the merits of the proposed development.

This wording is highly significant. It means Appendix B is a processing checklist, not an environmental assessment and not a confirmation that the EIAR, NIS, planning statement, public notices, planning history, EIA Portal material or townland information are accurate, complete or adequate.

Under the public notice information, Appendix B refers to all townlands within the site boundary being correctly named. That is a narrow requirement. It concerns townlands inside the site boundary. It does not mean that all townlands affected by the proposed development have been identified.

This is a major distinction. The effects of the proposed Lissinagroagh Wind Farm would not stop at the site boundary. The development may affect surrounding and downstream townlands through

surface water, underground water, karst pathways, peat movement, sediment release, construction traffic, turbine delivery, grid connection, shadow flicker, noise, landscape impact, tourism, biodiversity, Hen Harrier movement, Curlew movement, emergency access and cumulative effects with Faughery Wind Farm.

In my submission, the application should not merely identify townlands within the site boundary. It should also identify the wider affected townlands, including townlands adjoining the site, downstream of Dough Mountain, along the Lattone River, County River, Dooard River SAC, Sraduffy River, Lough Melvin SAC, Owenmore River, Lough Gill SAC, Glenfarne River and Lough MacNean, and along the separate grid connection and turbine delivery routes.

The same concern applies to the references in Appendix B to the EIA Portal, Planning Statement and Planning History. The fact that these items may be listed for completeness-check purposes does not prove that they have been properly recorded, fully assessed or adequately explained.

The planning history is highly material in this case. It should include and properly address the 2009 Dough Mountain refusal, the 2021 P.21/110 temporary 100 m mast Further Information request, the Planning Authority's concerns about upland bog and Shass Mountain, the Croagh Wind Farm refusal, the Letter Wind Farm refusal, Garvagh Glebe peat-slide evidence, Shass Mountain and other relevant peat, landslide, hydrology and ecological cases. If the application does not clearly identify and assess this planning history, then the completeness schedule cannot cure that defect.

The reference to the EIA Portal is also not enough by itself. EIA Portal notification is an administrative step. It does not prove that the EIAR has assessed the full project, including the current wind farm application, the requested ten-year/design flexibility application, the separate grid connection, turbine delivery, borrow pits, receiving water environment, underground water, karst, protected species, downstream SACs and cumulative effects.

In my submission, Appendix B confirms a weakness rather than resolving one. It shows that the application is being checked for processing purposes, but it expressly does not amount to an assessment of the merits. Therefore, An Coimisiun Pleanala must still examine whether all information has been properly recorded and whether the EIAR and NIS are substantively complete.

The applicant should be required to demonstrate clearly whether all townlands within the site boundary are correctly named; whether all directly and indirectly affected townlands outside the site boundary are identified; whether the full planning history has been recorded and assessed; whether the EIA Portal description reflects the whole project; whether the grid connection, design flexibility and ten-year permission are properly cross-referenced; whether the public notices allow the public to understand the full environmental footprint of the project; and whether the EIAR assesses the complete development and receiving environment.

A completeness-check schedule cannot replace a full assessment of accuracy, adequacy and environmental effects. If the application only identifies townlands within the site boundary and fails to identify the wider affected townlands, then the public notice and application documentation are too narrow. This undermines public participation and supports refusal.

Appendix A1 - Photograph Evidence: GSI Landslide Mapping, Upland Bog Slippage and River Pathways

These photographs should be read together with the GSI landslide/slippage mapping and the main objection. They show that the risk is not theoretical. The upland bog and NHA landscape contains steep ground, wet channels, visible slippage-prone areas and rivers directly below the slopes. Proposed turbine locations including T1, T2, T3, T4, T5 and T6 are within or adjacent to this wider slope, peat and drainage system. Any disturbance to peat, forestry, drainage or water movement could increase the risk of sediment, peat and polluted runoff entering downstream watercourses.

Photograph A1 - Upland bog slippage/GSI mapped area near proposed T1

This photograph shows the upland bog landscape adjacent to the proposed turbine areas, including ground conditions associated with the GSI slippage evidence. I rely on this photograph to show that peat instability and slope risk are visible in the receiving environment and should be assessed with the GSI landslide mapping.

Photograph A2 - Upland bog slippage adjacent to proposed T1 area

This photograph shows visible bog/peat disturbance and slippage in the upland area adjacent to the proposed T1 turbine location. I rely on this photograph together with the GSI landslide susceptibility mapping to show that the development is proposed in a landscape where peat instability is not theoretical but visible on the ground.

Photograph A3 - Bog slippage descending towards watercourse

This photograph shows bog/peat movement descending towards a watercourse. It supports my concern that peat disturbance or slippage from the wind farm area could enter streams and downstream waters, including the connected catchments leading towards the Lattone River, County River, Sraduffy River, Lough Melvin SAC and other protected waters.

Photograph A4 - Steep drainage channel crossing upland bog

This photograph shows a steep drainage route crossing upland bog. I rely on this as evidence that water movement on Dough Mountain is active, steep and connected. Any turbine foundation, hardstand, access track, culvert or drainage alteration could concentrate water, increase erosion force and destabilise peat.

Photograph A5 - Flash-flood water descending from Dough Mountain

This photograph shows fast water movement descending from Dough Mountain. It supports my concern that the EIAR underestimates flash-flood risk, emergency access difficulty, erosion risk and the speed at which sediment or pollution could be carried from turbine and borrow pit areas into downstream watercourses.

Photograph A6 - Saddle Hill upland bog descending towards mapped slippage area

This photograph shows the upland bog landscape descending from the Saddle Hill/Faughery direction towards the area identified on GSI mapping. It supports my objection that the proposed turbines at T2, T3 and nearby locations are within a connected slope, peat and drainage system, not isolated construction points.

Photograph A7 - Upland bog/NHA area, wind farm landscape and steep slippage above river

This photograph shows upland bog/NHA ground in the wider wind farm landscape, with steep ground and visible slippage above a river. I rely on this photograph with the GSI landslide/slippage mapping to show that peat instability, slope, water movement and downstream river risk are already present in the landscape adjacent to proposed turbine areas including T1, T2, T3, T4, T5 and T6.

Photograph A8 - River in flood below steep upland slippage

This photograph shows a river in flood below steep upland bog and slippage-prone ground. It supports my concern that any peat movement, sediment release, drainage failure or construction disturbance upslope could quickly enter watercourses and travel downstream through the connected catchment.

Photograph A9 - Steep slippage-prone ground above river channel

This photograph shows steep, wet upland ground above a river channel. I rely on it to support my objection that turbine roads, foundations, drainage works, borrow pits, culverts or heavy construction traffic in this landscape could increase erosion, destabilise peat and place watercourses at direct risk.

Attachment List for Joseph Sheerin Submission / Observation

Proposed Lissinagroagh Wind Farm

Planning Reference	PAX12.324290
Current Wind Farm Application	ACP-323048-25
Design Flexibility / 10-Year Permission	ACP-323910-25
Grid Connection	ACP-323353-25 - separate application but directly related
Submission Date	7 July 2026

Attachment 1 - Main Submission / Observation

Attachment 1: Joseph Sheerin Submission / Observation on the Proposed Lissinagroagh Wind Farm

- File downloaded in this chat:
  Lissinagroagh_Wind_Farm_Final_Submission_Joseph_Sheerin_Final_7_July.pdf
- Word version: Lissinagroagh_Wind_Farm_Final_Submission_Joseph_Sheerin_Final_7_July.docx

Purpose: This is the main written observation/objection. It should be treated as the lead document. The appendices below are supporting evidence and should be read together with the main observation.

Appendix A - Photograph Evidence Bundle

Appendix A1 - GSI Maps, Land Slippage, Upland Bog and River Pathways

- GSI landslide / land-slippage map evidence.
- Upland bog slippage adjacent to proposed T1 and the wider T1, T2, T3, T4, T5 and T6 area.
- Bog slippage descending towards a river and river in flood below slippage-prone upland ground.
- Steep drainage crossing upland bog and flash-flood water descending from Dough Mountain.
- Saddle Hill upland bog descending towards mapped slippage area from the Faughery direction.
- Upland bog, forestry and Saddle Hill, including cumulative context with Faughery Wind Farm.

Files downloaded / used in this chat:

- Bog Slippage GSI Map and T1 site.jpg
- Upland bog slippage and and site of T1.jpg
- Bog slippage into river.jpg
- Upland Bog NHA Wind Farm sight and Steep slippage above river.jpg
- Upland Bog NHA and Steep slippage above river.jpg
- Upland Bog NHA and Steep slippage above river 2.jpg
- Steep drainage crossing bog.jpg

- Flash Flood Dough Mountain.jpg
- Flash flowed Decending from Dough Mountain.jpg
- Saddle Hill view of bog decending towards bog slippage on GSI Map from Faughery direction .jpg
- Upland bog and slippage marked on GSI Map.jpg
- Upland bog forestry and Saddle Hill.jpg
- Faughery Wind Farm Saddle Hill and upland bog.jpg
- Slippage on GSI MAP T1 Lough Melvin.jpg
- Upland bog NHA on higher ground adjacent to winf farm and Lough Melvin.jpg
- Upland bog NHA overlooking forestry and Lough Melvin.jpg
- Lough MacNean - Curlews are feeding on sand bank.jpg
- Sand Martin Nests.jpg

Purpose: To support the objection on GSI mapped landslide susceptibility, visible bog slippage, steep drainage, flash-flood pathways, peat instability, river pollution risk and proximity to T1, T2, T3, T4, T5 and T6.

Appendix B - AIE / FOI / Planning Correspondence Bundle

Appendix B1 - AIE 11/26 Item 28 - Leitrim County Council Community and Public Engagement material

Appendix B2 - TOBIN Scoping Email / Leitrim County Council correspondence

Appendix B3 - Leitrim County Council Scoping Response dated 27 January 2025

Appendix B4 - P.21/110 Temporary 100 m Mast Further Information Request dated 9 July 2021

Appendix B5 - Project splitting / grid connection / design flexibility correspondence, where available

Files downloaded / used in this chat:

- (28) LCC response to Request for Scoping Lissanagroagh Wind Farm(2).pdf
- (27) Response to EIA Scoping Request 27.01.2025(2).pdf
- P21:110 Planning Queries Joseph Duffy to Coillte Request for Further Information.pdf

Purpose: To support the objection on community engagement, scoping, direct and indirect receiving environment, grid-route uncertainty, bird assessment, ground conditions, upland bog, Shass Mountain and the unacceptable deferral of essential investigations until after consent.

Appendix C - Technical Reports and Case Studies Bundle

Appendix C1 - Croagh Wind Farm Inspector Report

Appendix C2 - Garvagh Glebe Peat Slide / Emergency Response Records

Appendix C3 - Dykes 2022 Peat Landslide Paper

Appendix C4 - Shass Mountain / Boleybrack peat landslide evidence

Appendix C5 - Watercourses in the Community guidance

Appendix C6 - Climate / rainfall / storm evidence

Appendix C7 - Faughery Wind Farm water monitoring / karst records, where available

Files downloaded / used in this chat:

- Inspector's Report CROAGH WIND FARM ABP-310788-21 ABP-310789-21 .docx
- LM080009-AUGUST 2009 GARVAGH GLEGE WIND FARM - PEAT SLIDE EMERGENCY RESPONSE PLAN FOR RIVERS AT RISK FROM PEAT FAILURE AS A RISK OF TREE FELLING OPERATIONS.pdf
- LM080009-Correspondence Forest Service to Sean Crowe Felling Section 26 May 2009.pdf
- LM080009-Forest Services Sligo-Bog Slides in Sligo Leitrim.pdf
- LM080009-Turbulence Felling Glebe Wind Farm.pdf
- Dykes2022_Article_LandslideInvestigationsDuringP(1).pdf
- watercourses_in_the_community.pdf
- Climate Statement for January 2026.docx

Purpose: To support the objection on peat landslide risk, forestry operations, wind farm roads, access roads, borrow pits, bogflow, watercourse pollution, climate/rainfall, emergency response, construction sequencing and cumulative environmental effects.

Appendix D - Bird, Bat and Biodiversity Evidence Bundle

Appendix D1 - Hen Harrier compensation / OBMP extracts

Appendix D2 - Hen Harrier survey evidence 2020-2025

Appendix D3 - Breeding Bird Survey Report 2021, where available

Appendix D4 - Faughery Wind Farm bird surveys 2015, 2017 and 2019, where available

Appendix D5 - Curlew evidence / Lough MacNean

Appendix D6 - Bat evidence, including bats in shed beside T14, where available

Appendix D7 - Dough Mountain NHA Site Synopsis

Files downloaded / used in this chat:

- Pasted text(13).txt - Habitat Compensation, Legal Uncertainty, and Failure to Avoid Effective Loss of Hen Harrier
- Lough MacNean - Curlews are feeding on sand bank.jpg

- Sand Martin Nests.jpg

Purpose: To support the objection that the area is a functioning Hen Harrier, Curlew, bat and upland biodiversity landscape; that compensation is not avoidance; and that the EIAR should assess the wider functional landscape, not only turbine positions.

Appendix E - Maps and Location Evidence Bundle

Appendix E1 - Turbine Layout Map showing T1 to T14

Appendix E2 - GSI Landslide / Slippage Mapping

Appendix E3 - Watercourse Map showing underground water, groundwater, karst pathways, springs, swallow holes, caves, Lattone River, County River, Dooard River SAC, Sraduffy River, Lough Melvin SAC, Owenmore River, Lough Gill SAC, Glenfarne River and Lough MacNean

Appendix E4 - Dough / Thur Mountains NHA Map

Appendix E5 - Lough Melvin SAC and Lough Gill SAC Map

Appendix E6 - Faughery Wind Farm cumulative impact map

Appendix E7 - Grid connection route map, if available

Appendix E8 - Turbine delivery route map, if available

Appendix E9 - Townlands map showing townlands within the site boundary and wider affected townlands outside the boundary

Purpose: To show that the development affects a wider upland, hydrological, ecological and community system, not only townlands inside the site boundary.

Appendix F - Community, Tourism and Local Amenity Evidence Bundle

Appendix F1 - Kiltyclogher community / tourism evidence

Appendix F2 - Public engagement evidence

Appendix F3 - Local infrastructure evidence including Net1 mast, ESB vulnerability, emergency communications, road access and forestry windthrow where available

Purpose: To support the objection on public participation, tourism, local amenity, community impacts, access, emergency communications and infrastructure vulnerability.

Cover Note Wording

Please find attached my submission/observation on the proposed Lissinagroagh Wind Farm, together with supporting appendices. I request that all attached photographs, maps, AIE/FOI correspondence, planning records, technical reports and biodiversity evidence are treated as part of my submission / observation.

Joseph Sheerin Submission / Observation

Attachment List with Photographs, Documents and Captions

Proposed Lissinagroagh Wind Farm

Planning Reference	PAX12.324290
Current Wind Farm Application	ACP-323048-25
Design Flexibility / 10-Year Permission	ACP-323910-25
Grid Connection	ACP-323353-25 - separate application but directly related
Date	7 July 2026

Purpose: This document matches the attachment list with the photographs and documents downloaded in this chat. The photographs are inserted with captions. The supporting records are listed with the filename, appendix number and purpose. All listed files are also copied into the accompanying ZIP package.

Attachment 1 - Main Submission / Observation

File: Lissinagroagh_Wind_Farm_Final_Submission_Joseph_Sheerin_Final_7_July.pdf

Word version: Lissinagroagh_Wind_Farm_Final_Submission_Joseph_Sheerin_Final_7_July.docx

Purpose: Main written observation/objection. The appendices should be treated as supporting evidence and read together with the main observation.

Appendix A - Photograph Evidence Bundle

Appendix A1 - GSI Maps, Land Slippage, Upland Bog and River Pathways

These photographs support the objection on GSI mapped landslide susceptibility, visible bog slippage, river pathways, steep drainage, flash-flooding, peat instability, watercourse pollution risk and proximity to proposed turbine areas including T1, T2, T3, T4, T5 and T6.

A1 - GSI map / T1 context and upland bog slippage

Caption: This photograph should be read with the GSI landslide / land-slippage mapping. It shows upland bog and the proposed T1 context, supporting the objection that peat instability and mapped slippage risk are relevant to the proposed turbine layout.

Source file: Bog Slippage GSI Map and T1 site.jpg

A2 - Upland bog slippage adjacent to proposed T1 area

Caption: This photograph shows visible bog/peat disturbance and slippage in the upland area adjacent to the proposed T1 turbine location. It supports the submission that peat instability is visible on the ground and is not only a theoretical risk.

Source file: Upland bog slippage and and site of T1.jpg

A3 - Bog slippage descending towards watercourse

Caption: This photograph shows bog/peat movement descending towards a watercourse. It supports the concern that peat movement, sediment or pollution from the wind farm area could enter streams and downstream protected waters.

Source file: Bog slippage into river.jpg

A4 - Upland bog / NHA landscape and steep slippage above river

Caption: This photograph shows upland bog/NHA ground in the wider wind farm landscape, with steep ground and slippage-prone terrain above a river. It supports the link between GSI mapping, visible ground conditions and downstream watercourse risk.

Source file: Upland Bog NHA Wind Farm sight and Steep slippage above river.jpg

A5 - Steep upland bog and river pathway below slippage-prone ground

Caption: This photograph shows steep, wet upland ground above a river channel. It supports the objection that roads, drainage works, turbine foundations, borrow pits or heavy construction traffic could increase erosion and peat instability.

Source file: Upland Bog NHA and Steep slippage above river.jpg

A6 - River in flood below steep upland slippage

Caption: This photograph shows a river in flood below steep upland bog and slippage-prone ground. It supports the concern that peat or sediment released upslope could quickly enter connected watercourses.

Source file: Upland Bog NHA and Steep slippage above river 2.jpg

A7 - Steep drainage channel crossing upland bog

Caption: This photograph shows a steep drainage route crossing upland bog. It supports the concern that water movement on Dough Mountain is active, steep and connected, and could be altered or concentrated by turbine infrastructure.

Source file: Steep drainage crossing bog.jpg

A8 - Flash-flood water descending from Dough Mountain

Caption: This photograph shows rapid water movement descending from Dough Mountain. It supports the objection on flash-flood risk, emergency access difficulty, erosion risk and the speed at which sediment or pollution could be carried downstream.

Source file: Flash Flood Dough Mountain.jpg

A9 - Flash flow descending from Dough Mountain

Caption: This photograph further shows fast water movement descending from Dough Mountain, supporting the submission that the EIAR must assess rainfall, flash flooding, drainage concentration and downstream water risk.

Source file: Flash flowed Decending from Dough Mountain.jpg

A10 - Saddle Hill upland bog descending towards mapped slippage area

Caption: This photograph shows upland bog descending from the Saddle Hill/Faughery direction towards an area identified on GSI mapping. It supports the objection that T2, T3 and nearby locations are part of one connected peat, slope and drainage system.

Source file: Saddle Hill view of bog decending towards bog slippage on GSI Map from Faughery direction .jpg

A11 - Upland bog and visible ground disturbance corresponding with GSI mapping

Caption: This photograph shows upland bog and visible ground disturbance in the area corresponding with GSI landslide/slippage mapping. It supports the submission that the GSI mapping should be treated seriously and compared with real ground conditions.

Source file: Upland bog and slippage marked on GSI Map.jpg

A12 - Upland bog, forestry and Saddle Hill landscape

Caption: This photograph shows the relationship between upland bog, commercial forestry and Saddle Hill. It supports the objection that the site is a connected peat, forestry, slope and water environment, not isolated turbine points.

Source file: Upland bog forestry and Saddle Hill.jpg

A13 - Faughery Wind Farm, Saddle Hill and adjoining upland bog

Caption: This photograph shows existing wind energy development in the wider Saddle Hill/upland bog landscape. It supports the cumulative-impact objection and the argument that further turbines would extend industrialisation of a sensitive upland peat landscape.

Source file: Faughery Wind Farm Saddle Hill and upland bog.jpg

A14 - Slippage on GSI mapping context with Lough Melvin direction

Caption: This photograph links the slippage-prone upland landscape with the wider Lough Melvin direction. It supports the concern that slope, peat and hydrology effects can travel beyond the turbine footprint.

Source file: Slippage on GSI MAP T1 Lough Melvin.jpg

A15 - Upland bog NHA on higher ground adjacent to wind farm and Lough Melvin

Caption: This photograph shows the upland bog/NHA landscape in relation to forestry and Lough Melvin. It supports the objection that the development is proposed in a water-source and conservation-sensitive landscape.

Source file: Upland bog NHA on higher ground adjacent to winf farm and Lough Melvin.jpg

A16 - Upland bog NHA overlooking forestry and Lough Melvin

Caption: This photograph shows the relationship between upland bog, forestry and Lough Melvin. It supports the argument that the receiving environment includes protected downstream waters and should not be confined to the red-line boundary.

Source file: Upland bog NHA overlooking forestry and Lough Melvin.jpg

A17 - Curlews feeding on sandbank at Lough MacNean

Caption: This photograph shows Curlews feeding at Lough MacNean. It supports the submission that the wider receiving environment includes lakes, wetlands and feeding areas used by sensitive bird species.

Source file: Lough MacNean - Curlews are feeding on sand bank.jpg

A18 - Sand Martin nests / biodiversity evidence

Caption: This photograph is included as local biodiversity evidence and supports the objection that the EIAR should assess the wider functioning landscape, river corridors, banks and habitat features affected directly or indirectly by the development.

Source file: Sand Martin Nests.jpg

Appendix B - AIE / FOI / Planning Correspondence Bundle

These records support the objection on scoping, public engagement, all directly/indirectly impacted areas, grid uncertainty, bird assessment, ground conditions, upland bog and Shass Mountain.

No.	Document / File	Caption / Relevance	Bundle folder
B1	Leitrim County Council scoping response / AIE Item 28 (28) LCC response to Request for Scoping Lissanagroagh Wind Farm(2).pdf	Supports the objection on community and public engagement, direct and indirect receiving environment, comprehensive surveys, peat stability, hydrology, material storage, flood risk, biodiversity and cumulative effects.	Appendix B
B2	Email chain and Council response to TOBIN scoping request (27) Response to EIA Scoping Request 27.01.2025(2).pdf	Shows the TOBIN consultation and the Council response on EIAR scoping, including the project description, site/surrounding area surveys and relevant planning authority issues.	Appendix B
B3	P.21/110 temporary 100 m mast Further Information request, 9 July 2021 P21:110 Planning Queries Joseph Duffy to Coillte Request for Further Information.pdf	Supports the argument that Leitrim County Council considered post-consent confirmation of ground conditions unacceptable for a temporary mast in upland bog, having regard to Shass Mountain.	Appendix B

Appendix C - Technical Reports and Case Studies Bundle

These reports support the objection on peat landslide risk, forestry operations, wind farm access roads, borrow pits, emergency response, watercourse pollution, climate/rainfall and cumulative effects.

No.	Document / File	Caption / Relevance	Bundle folder
C1	Croagh Wind Farm Inspector Report Inspector's Report CROAGH WIND FARM ABP-310788-21 ABP-310789-21 .docx	Supports the objection on peat/spoil volumes, borrow pits, repositories, drainage uncertainty, landslide risk, water pollution and refusal-level issues in comparable upland conditions.	Appendix C
C2	Garvagh Glebe peat slide emergency response plan LM080009-AUGUST 2009 GARVAGH GLEGE WIND FARM - PEAT SLIDE EMERGENCY RESPONSE PLAN FOR RIVERS AT RISK FROM PEAT FAILURE AS A RISK OF TREE FELLING OPERATIONS.pdf	Supports the objection on peat failure, rivers at risk, emergency response, forestry operations and the limits of mitigation after an incident starts.	Appendix C
C3	Garvagh Glebe Forest Service correspondence LM080009-Correspondence Forest Service to Sean Crowe Felling Section 26 May 2009.pdf	Supports the objection on forestry operations, peat movement, river-risk barriers and the need to prevent pollution at source.	Appendix C
C4	Forest Service / Sligo-Leitrim bog-slide records LM080009-Forest Services Sligo-Bog Slides in Sligo Leitrim.pdf	Supports the objection on known bog-slide and peat-failure risk in the wider regional context.	Appendix C
C5	Garvagh Glebe turbulence/felling record LM080009-Turbulence Felling Glebe Wind Farm.pdf	Supports the objection on forestry, wind farm works, peat disturbance and construction-stage instability.	Appendix C
C6	Dykes 2022 peat landslide paper Dykes2022_Article_LandslideInvestigationsDuringP(1).pdf	Published scientific evidence supporting the peat landslide, bogflow, forestry, wind farm access road and downstream pollution arguments.	Appendix C
C7	Watercourses in the Community guidance watercourses_in_the_community.pdf	Supports the argument that watercourses, drainage and catchments must be treated as connected systems where interference in one part can affect downstream areas.	Appendix C
C8	Climate, rainfall and storm evidence Climate Statement for January 2026.docx	Supports the objection on climate change, heavy rainfall, storm events, flash flooding, forestry windthrow and changing baseline conditions over a long permission period.	Appendix C

Appendix D - Bird, Bat and Biodiversity Evidence Bundle

These records support the objection on Hen Harrier, compensation uncertainty, Curlew, Sand Martin/biodiversity evidence and the wider functional landscape.

No.	Document / File	Caption / Relevance	Bundle folder
D1	Hen Harrier compensation and legal uncertainty section Pasted text(13).txt	Supports the objection that the applicant's compensation strategy is an admission of likely displacement and possible effective loss of Hen Harrier from the site, not true avoidance.	Appendix D

Appendix E - Maps and Location Evidence Bundle

Use the GSI mapping and the map/photo evidence in Appendix A together with turbine layout, watercourse, NHA, SAC, grid route, delivery route and townland maps. The purpose is to show the full connected upland, hydrological, ecological and community system.

Appendix F - Community, Tourism and Local Amenity Evidence Bundle

Use local community, tourism, Heritage Centre, access, Net1, ESB vulnerability, public engagement and local infrastructure evidence to support community and amenity impacts.

Cover Note Wording for Lodgement

Please find attached my submission/observation on the proposed Lissinagroagh Wind Farm, together with supporting appendices. I request that all attached photographs, maps, AIE/FOI correspondence, planning records, technical reports and biodiversity evidence are treated as part of my submission / observation.

Appendix B - Essential AIE / FOI / Planning Correspondence

Joseph Sheerin Submission / Observation

Proposed Lissinagroagh Wind Farm

Planning Reference	PAX12.324290
Current Wind Farm Application	ACP-323048-25
Design Flexibility / 10-Year Permission	ACP-323910-25
Grid Connection	ACP-323353-25 - separate application but directly related

Purpose of this reduced appendix

This reduced Appendix B keeps only the essential AIE / FOI / planning correspondence extracts needed to support the submission. It is intended to reduce the volume of material while retaining the key documents on scoping, grid reference, direct and indirect receiving environment, peat and landslide risk, community engagement, and the 2021 temporary mast Further Information request.

Contents

B1 - TOBIN Scoping Email Extract

Essential extract showing the project included turbine foundations, hardstandings, borrow pits, access tracks, a 110 kV substation and underground grid connection, and that surveys were being undertaken at the site and surrounding area.

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Email: jcolreavy@leitrimcoco.ie
Website: www.leitrim.ie

Comhairle Chontae Liatroma
Leitrim County Council

My working day may not match your working day. Please do not feel obliged to reply to this email outside of your normal working hours.

From: Brian McDonnell <brian.mcdonnell@tobin.ie>
Sent: Tuesday 3 December 2024 14:09
To: planning <planning@leitrimcoco.ie>; Roads <roads@leitrimcoco.ie>
Cc: Sinead Ryan <Sinead.Ryan@tobin.ie>
Subject: Proposed Lissinagroagh Wind Farm Consultation

To Whom It May Concern,

FuturEnergy Ireland DAC proposes to develop a wind farm north of Manorhamilton in County Leitrim approximately 3 km south of the Northern Ireland border in County Fermanagh. The project will involve the development of a wind farm and all associated infrastructure including turbine foundations, hardstanding areas, borrow pits, access tracks, a 110kV electrical substation and an underground grid connection.

FuturEnergy Ireland DAC have commenced the process of Environmental Impact Assessment (EIA). The proposed wind farm site entrance, layout design and access points through which turbine components and construction deliveries may be made will be refined by the design team in consultation with the relevant planning authority and the local community. Detailed surveys and studies are currently being undertaken at the site and surrounding area and a project website has been established (https://lissinagroaghwindfarm.ie/). A team of technical experts are currently engaged in the process of scoping the environmental assessments for the project.

We invite you to submit any relevant information that you may hold and/or highlight any issues that you feel should be directed to the project team. Please see the enclosed EIA Scoping Document for further information (updated from the previously issued 2021 scoping report). Views/comments on the proposal can be submitted by email or letter to the undersigned as soon as convenient to ensure your views/comments are considered.

We request that submissions are provided before 5pm on Friday 24th January 2025.

Regards,
Brian

Notice of Upcoming Leave from Friday 13th December – 3rd January

Brian McDonnell (BCL)(MSc)
Assistant Project Manager/Environmental Scientist

TOBIN
Galway | Dublin | Castlebar | Limerick | Sligo
Telephone: +353 (0)1 8030401
Email: brian.mcdonnell@tobin.ie

B2 - Leitrim County Council Scoping Response: Essential Extracts

Essential extracts from Item 28, including direct and indirect receiving environment, comprehensive surveys, peat stability, GSI landslide susceptibility, hydrology, Dough/Thur Mountains NHA, previous refusal, material storage, major accidents and community engagement.

Item No 28

Comhairle Chontae Liatroma
Leitrim County Council

Áras an Chontae
Cora Droma Rúisc
Contae Liatroma
N41 PF67

Áras an Chontae
Carrick on Shannon
County Leitrim
N41 PF67

Mr Brian McDonnell,
Assistant Project Manager/Environmental Scientist,
TOBIN Consultant Engineers

27th January 2025

RE: Proposed Lissinagroagh Wind Farm Consultation – EIAR Scoping Report Request

Dear Brian,

Leitrim County Council welcomes the opportunity to contribute to the scoping process and to ensure that the prospective EIAR addresses all relevant issues. In response to your request, please now be advised that the following constitutes Leitrim County Council's written opinion on the information to be contained in the Environmental Impact Assessment Report to be prepared in respect of the above-mentioned proposed development.

The preparation of the EIAR shall have regard to the guidance document, ***Guidelines on the information to be contained in Environmental Impact Assessment Reports*** (Environmental Protection Agency, 2022) in terms of the content and structure of the EIAR and prescribed environmental factors. Moreover, the relevant assessments, conclusions, recommendations and proposed mitigation measures to be presented in the EIAR shall be prepared by suitably qualified specialists within their respective environmental expertise.

Planning Policy Considerations
Any prospective planning application for the proposed development shall be assessed against the policies and objectives contained within the **Leitrim County Development Plan 2023-2029**. In this regard, the policies and objectives addressed in the following, but not exclusive, sections of the Plan are considered to be of particular relevance:

Section 2.2 – Vision and Strategic Aims sets out a range of strategic aims and complementary strategic objective for the sustainable development of the county, including "*development that addresses climate change in terms of adaptation and mitigation measures including increasing flood resilience, the promotion of sustainable transport options and the development of renewable energy technologies where possible to achieve a successful transition to a low carbon economy".*

Section 4 – Economic Development – sets out the policy framework for the economic development of the county across a number of sectors including tourism, rural-based enterprise and employment, infrastructural and renewable energy.

Section 5 – Tourism contains a number of policies and objectives targeting tourism development within the county including the development of amenity and recreational assets/facilities and harnessing the county's natural and heritage resources in a sustainable manner for tourism activities. The views of prescribed bodies such as Fáilte Ireland are also recommended to be solicited in the preparation of any forthcoming EIAR on this proposed development.

Phone: 071 96 20005
Email: customerservices@leitrimcoco.ie
Follow:

development is in accordance with the policies and objectives set out elsewhere in the Plan. Development Management Standards specific to energy, telecommunications and services, including wind energy development, are set out in Section 13.20.

The Standards reiterate that when assessing planning applications for wind energy development, the Planning Authority shall have regard to the ***'Wind Energy Development Guidelines for Planning Authorities'*** **(DoEHLG, 2006)**, and any updates to these Guidelines which may be made, and the ***'Interim Guidelines for Planning Authorities on Statutory Plans, Renewable Energy and Climate Change'*** **(DoHPCLG, 2017)**, in addition to the policy and guidance provided in Section 12 of Volume I - Written Statement and Appendix X of the Plan.

In addition, the following will be considered by the Planning Authority in relation to any planning application for wind energy development:

- Impact on the visual amenities of the area.
- Impact on the residential amenities of the area.
- Scale and layout of the project, any cumulative effects due to other projects and the extent to which the impacts are visible across the local landscape.
- Visual impact of the proposal with respect to protected views, scenic routes and designated scenic landscapes.
- Impact on nature conservation, water quality, ecology, including an assessment of impacts on collision risk species (birds and bats), soil, hydrology, groundwater, air quality, archaeology, built heritage and public rights of way.
- Impact on ground conditions and geology.
- Impact on peat stability and robust geotechnical assessment of potential for peat slippage.
- Consideration of falling distance plus an additional flashover distance from wind turbines to overhead transmission lines.
- Impact of development on the road network in the area.
- Impact on human health in relation to:
  - Noise disturbance (including consistency with the Word Health Organisations 2018 Environmental Noise Guidelines for the European Region).
  - Shadow flicker (for wind turbine developments, including detailed Shadow Flicker Study).

This list is not exhaustive, and the Planning Authority may consider other requirements in relation to traffic and transport assessments, road safety audits/road safety impact assessments, access onto public roads, haul route assessment etc. Section 13 sets out development management standards in relation to such items and other considerations which should be consulted with in the preparation of any EIAR and planning application documentation associated with the proposed development.

Environmental and Ecological Considerations

The EIAR shall take account of all ecological sensitivities and of the likely environmental effects of the proposed development on the receiving environment. All in combination and cumulative effects of the proposed development within the zone of influence of the proposal are to be considered together with the following:

1. **The Proposed Development** - to include information on the site, design, size and other relevant features of the proposed development. The proposed development should be described in scaled drawings, photographs and photomontages.

2. **The Existing Environment** - The existing environment and the impacts of the development are explained by reference to its possible impact on the following environmental factors:

   - Population, and Human Health
   - Biodiversity with particular attention to species and habitats protected under the Habitats and Birds Directives
   - Land, Soil, Water, Air and Climate
   - Material Assets, Cultural Heritage and the Landscape
   - The interaction between the above factors

   In terms of the receiving environment, the EIAR shall include all areas that would be impacted upon, directly or indirectly, by the proposed development. The information contained in the EIAR should therefore be based on comprehensive surveys of the area and have regard to updated data bases which may exist in terms of heritage and ecology. The EIAR should accurately describe the receiving environment in terms of geology, geomorphology and hydrology, as well as a physical description of the site proposed for development.

3. **The Likely Significant Effects of the Proposed Development** - Impacts should address direct, indirect, secondary, cumulative, short, medium and long-term, permanent, temporary, positive and negative effects as well as impact interactions. None of the topics outlined above (Population and Human Health, etc.) should be omitted, although their level of detail may differ depending on the likelihood of impacts having regard to the remote setting of the proposed development and proximity to sensitive receptors.

   In accordance with the requirements of Article 94 of the Planning and Development Regulations, 2001 (as amended), the EIAR shall contain a reference list detailing the sources used for the impact descriptions and assessments used in the EIAR.

   The EIAR should also contain a list of experts who contributed to the development of the report, identifying for each expert, the part of the EIAR for which he/she/they is/are responsible, his/her/their experience or expertise and any additional information considered relevant to demonstrate the persons competence in the preparation of the EIAR.

   An assessment of the impact of the proposed development is required, with an assessment of the cumulative impact of existing and permitted developments in the vicinity. The assessment of cumulative impacts in the EIAR should also have regard, as far as is practicable, to the likely effects arising from any future phases or extension of the proposed windfarm.

   Further to the above, details of the environmental impacts of the development during the excavation, construction and operational phases of the development should also be described and assessed by reference to baseline information which should be collated and presented within the EIAR. The environmental impact of the aforementioned phases, including in particular noise and shadow flicker impacts arising from the operational phase and construction

phase impacts in terms of materials storage and containment within the site should also be described and assessed.

The EIAR will be required to provide information regarding the nature, quantities and source of materials to be used in the overall development. Information will also be required on volumes and nature of waste materials likely to be generated in the construction phase and proposed means for disposal or relocation within the site boundaries of same.

The EIAR should also provide an assessment of the expected effects arising from the vulnerability of the project to major accidents and disasters that are relevant to the project. These risks should be considered in the context of the factors of the environment.

4. **The Measures to Mitigate Adverse Impacts** - The EIAR shall give a description of the features of the proposed development and measures envisaged to avoid, prevent, reduce and, if possible, offset likely significant adverse effects on the environment. Where adverse impacts are likely to result, appropriate mitigation measures shall be identified where necessary - and shall clearly indicate where and with whom responsibility for the implementation of the mitigation measures lies. The EIAR shall also provide information relating to the monitoring of the impacts of the development on the environment.

5. **The Consideration of Alternatives** - The consideration of alternatives, in terms of location and design, should also be addressed in the EIAR and should comprise a description of the reasonable alternatives relevant to the proposed development which were studied and the reason for the option chosen having regard to the effects on the environment. In undertaking this assessment of alternatives, the following should be borne in mind:

   - Alternatives should be relevant to the project and its specific characteristics.
   - The assessment of alternatives should include a description of the current state of the environment without implementing the project, i.e. the Do-Nothing scenario. This assessment should be the starting point for the consideration of impacts in the EIAR.
   - In the assessment of alternatives, the level of detail provided should be reasonable and commensurate with the project. The assessment will also include the main reasons for selecting the chosen option and shall include a comparison of the environmental effects of the reasonable alternatives.

6. **A Non-Technical Summary** - The EIAR must contain a non-technical summary of the detailed information contained within the EIAR. The language of this summary shall be non-technical in nature and should provide clear details of the environmental effects the development will have, as well as all significant effects and mitigation measures proposed. The description of the development in this summary should clearly explain and describe all aspects of the proposed development such that the EIAR is accessible in terms of public understanding of the process and to facilitate full public participation and consultation in the process.

   In terms of specific environmental topics, the development is likely to impact upon, the EIAR should, in particular, address the following matters:

   - Population, and Human Health

- Biodiversity (for example fauna and flora),
- Land (for example land take), Soil (including organic matter, erosion, compaction, sealing), Water (for example hydro morphological changes, quantity and quality), Air and Climate (including greenhouse gas emissions, impacts relevant to adaptation),
- Material Assets, Cultural Heritage, (including archaeological aspects) and Landscape.
- Interactions between the above factors.

An outline of the specific issues considered relevant to the EIAR under these headings is given in the following sections:

7. **Population, and Human Health**

As identified in the submitted Scoping Report, the scope of population and human health and the consideration of associated impacts extends to the assessment of those environmental factors which might lead to effects on human health (including noise, vibration, traffic and transportation, air quality, amenity, water quality & flood risk).

An assessment of the impact of the proposed development on any local recreational and tourist facilities and overall level of amenity and the potential impacts arising for population and human health should be addressed in the EIAR.

8. **Biodiversity**

The EIAR should provide a clear baseline assessment of the existing receiving environment and the impact of the development on the terrestrial and aquatic ecology of the receiving environment (including fisheries).

Whilst the study area does not appear to contain European sites, it is adjacent to the Lough Gill SAC (Site Code 001976) to the southwest with Arroo Mountain SAC (Site Code 001403) to the west of the R282 and Lough Melvin SAC (Site Code 000428) a similar distance to the northwest. There is therefore a need to carry out Screening for Appropriate Assessment under the Habitats Directive and further assessment if necessary. The results of such assessments will inform the Biodiversity section of the EIAR. The Appropriate Assessment will need to focus on the potential impacts arising on the European sites arising from the operational and particularly the construction phases of the development. Potential adverse impacts on the conservation objectives for designated habitats arising from the proposed development require careful consideration and analysis based on best available techniques and underpinned by the precautionary principle in formulating any recommendations/conclusions stemming from such analysis.

Ornithology – Field survey methodologies should be carried out using survey standards recommended by NatureScot (formerly Scottish Natural Heritage (SNH), 2017), which are widely regarded as representing best practice in Ireland and carried out during suitable times of the year. Two full years of bird survey data, as recommended by current NatureScot (2017) guidance, should be undertaken in forming any analysis/assessment of the potential impacts of the proposed development in this regard.

The submitted Scoping Report states "*It should also be noted that the Dough/Thur Mountains Natural Heritage Area (NHA) is located adjacent to the eastern boundary of the wind farm site*." No

boundary has been provided to the Local Authority, just a study area outline. The inclusion of Dough / Mountain NHA (Site Code 002384) within the site study area is therefore of particular significance. This NHA contains an extensive area of upland blanket bog, with associated upland heath and grassland. Blanket bog habitat is a globally scarce resource. Upland blanket bogs, due to their exposure to severe climatic conditions at high elevations, are particularly vulnerable to erosion by human activities and extensive areas are currently undergoing active erosion due mainly to overgrazing. The current area of intact upland blanket bog in Ireland represents only a fraction of the original resource, due to the combined impacts of afforestation and overgrazing, and intact examples are therefore extremely valuable for nature conservation. Their long-term survival requires sensitive management. A large oligotrophic lake also occurs on the southern side of Thur Mountain. The impact of the proposed development on the NHA shall be clearly assessed as part of the EIAR.

In addition, please be advised that a proposed windfarm development was refused previously at Dough Mountain by An Bord Pleanála (ref. PL 12.234741 / LCC P09/260). The applicants were 'An Dough Windfarm limited' and the proposed development sought planning permission to erect a windfarm on a 140 hectare area close to the summit of Dough Mountain. The proposed development consisted of eight turbines, a transformer compound, an electrical control building, inter-turbine service roadways, eight hardstand areas and ancillary works such as underground electrical ducting, etc. Each turbine would have a three megawatt power rating. There will be a hardstand area at each turbine. The total power output capacity of the proposed windfarm was 24 megawatts. The turbines would be 80m in height and the rotor blades will be 45m each in length. An environmental impact statement formed part of the documentation required by this application.

Permission was refused by the Board for 2 no. stated reasons, the first of which is relevant in this context:

1) The site is located within the Dough/Thur Mountains Natural Heritage Area (number 2384) which comprises an extensive area of intact upland blanket bog in association with Dry and Wet Heath. Blanket Bog is listed in Annex I of the EU Habitats Directive 1992 and Active Blanket Bog is listed as a Priority Habitat. Having regard to the location of the proposed wind farm centrally within the proposed Natural Heritage Area near the summit of the hill, within an area of relatively intact bog, the depth of peat on the site, the slope of blanket bog and the wet nature of the bog, it is considered, on the basis of the information submitted with the planning application and the appeal, that the proposed development would pose an unacceptable risk of degradation of the priority habitat. Furthermore, the Board is not satisfied that the proposed development would not lead to surface pollution and risk of slope instability. The proposed development would, therefore, be contrary to the proper planning and sustainable development of the area.

The above reason shall be considered carefully in the preparation of the EIAR and the reason for refusal clearly addressed and mitigated.

The scope and nature of the ecological and related surveys should be reviewed with the NPWS section of the Department of Housing, Local Government and Heritage and with the IFI. The work should comply with best practice for seasonality and scope, and the various environmental

directives, legislation and guidance documents should be complied with. The comments of the Development Applications Unit on these issues should be sought.

The EIAR should address the potential for the enhancement of the biodiversity of the site arising from the development and the measures undertaken to maximise these impacts.

The EIAR should contain an Invasive Species Management Plan to address the removal of any invasive species and prevent their spread, and the subsequent treatment of the affected areas. A Biosecurity Plan should be prepared.

Ecology inputs should be provided in the form of an Ecological Impact Assessment (ECIA) which would contain ornithological, aquatic, habitat and bat surveys. Bat, Mammal and ornithological surveys should be undertaken for 2 years to Scottish Natural Heritage standards.

Cumulative impacts with other developments, including but not limited to other wind farms, should be assessed for all sensitive receptors. Interactions with other environmental disciplines, especially hydrology and climate should also be assessed.

9. **Land, Soil and Geology**

Potential construction and operational impacts of the proposed development on the land, soils and geology of the subject site and wider area should be informed by extensive geotechnical, geological, hydrological and hydrogeological surveys by suitably qualified experts at varying times of the year.

The EIAR should provide information relating to the amount and description of materials disturbed or excavated on the site and proposals for the storage, reuse and disposal of material excavated or otherwise generated during the construction phase of development. The impact of excavations required as part of the development should describe, assess and mitigate the potential impact of the proposed development on existing sub surface services that may be present on the site. An assessment of the impact of such excavations or other ground disturbances should be provided.

The chapter shall provide details of the types and nature of materials imported to the site during construction together with construction methods to be employed and measures to prevent the importation of invasive species. Mitigation measures to prevent or minimize emissions from the site during the construction phase, should also be provided.

It is noted in the scoping report that the GSI's Landslide Susceptibility Mapping was used to assist in the identification of areas which are subject to landslides. The southern part of the study area has been identified to be low in landslide susceptibility whilst the central and northern part of the study area have been identified as moderate to high in landslide susceptibility. Without any sight of the layout of the proposed development, the Local Authority would remind TOBIN Consultant Engineers of the outcome of 2 recent applications for wind farm developments in Co. Leitrim which were refused planning permission by An Bord Pleanála. The relevant reference numbers are PL12.310789 / LCC 20/120 (applicants were Coillte CGA) and PL12.319480 / LCC 24/60008 (applicants were Letter Wind Farm Limited). The Local Authority would direct TOBINS to examine the decision and the relevant inspector's reports quite carefully with regard to

landslide susceptibility, history of landslides in the vicinity of the site, the presence or otherwise of tension cracks present on or adjoining the site, rainfall levels, the upland and sloping nature of the site, the density of drainage channels throughout the site, the volumes of peat and other spoil material which will require excavation, handling, storage and management within the site, the stability associated with the movement and placement of such materials, the depth and nature of peat likely to be encountered, the drainage impact of such works on existing conditions and flow patterns, etc. The EIAR will have to demonstrate that the proposed development will adequately mitigate the risk associated with a potential landslide as a consequence of the development of the proposed wind farm, with potential for causing pollution of waterbodies within and in the vicinity of the site. Any proposed repositories would need to be demonstrated as being effective in providing for the permanent retention of peat and other materials and the mitigation measures, inclusive of the proposed drainage system, would be adequate to ensure the protection of the environment.

The applicants should be aware of a significant peat landslide event which occurred on the 28th of June 2020 on Shass Mountain, north of the study area (see report on this event at: https://www.npws.ie/sites/default/files/publications/pdf/shass-mountain-landslide-report-october-2020.pdf). Given the proximate location of this event to the subject site, in geological terms at least, and the severity of the impact of this event on the local environment, ecology and infrastructure as well as the remediation cost and impact on human population, significantly robust and extensive geotechnical and hydrogeological investigations should be undertaken and suitably documented in any submitted EIAR. Any recommendations/conclusions in relation to the potential impacts of the proposed development, borne out of the aforementioned extensive surveys and analysis, should be underpinned by the precautionary principle also.

10. **Hydrology and Hydrogeology**

Comprehensive geological, hydrological and hydrogeological assessments shall be undertaken as part of the EIAR study, including appropriate seasonal monitoring programmes/regimes in respect of surface water and groundwater regimes. The hydrology of the surrounding lands and peatlands needs to be given due consideration in any EIAR of the proposal as well as the potential of proposed drainage schemes to serve the proposed development on the wider receiving environment and cumulatively in conjunction with existing drainage schemes such as those associated with forestry sites in the locality. A robust and comprehensive assessment of the potential impacts of the proposed development on the water quality objectives of adjacent waterbodies shall be undertaken also.

It is considered that certain matters relevant to this section have been covered indirectly in previous sections. The study area contains a number of watercourses which includes the Rosfriar_010, Lattone_010, Cornavannoge_010, the Owenmore (Manorhamilton)_020). The latter has a direct hydrological link to the Lough Gill SAC. This is also important in the context of Appropriate Assessment.

The impact of materials to be excavated and/or stored on the site will require to be considered in terms of the potential impact on surface and ground waters in the area of the site. Changes to the existing ground surface will lead to alterations in surface water drainage patterns and the existing on-site surface water drainage regimes should be clarified as part of the EIAR and

application documentation, and the impacts of the proposed development on these existing drainage networks should be clearly set out.

The impact of infrastructure to be installed on the site will require to be considered in terms of the potential impact on hydrological processes and local water course channels. This should be clarified as part of the EIAR and application documentation, and the impacts of the proposed development on prevailing flow patterns and channel morphology should be clearly set out.

Assessments regarding flood risk and drainage should detail and make provision for the accommodation of climate change impacts. Appropriate mitigation/drainage measures will be proposed/required to ensure there is no increase in runoff from the proposed development and therefore ensure no impact on existing watercourses or on potential flooding of the downstream catchments.

11. **Air Quality**
The EIAR shall identify, describe and assess the potential significant direct and indirect effects on air quality arising from the construction, operation and decommissioning of the proposed development and cumulatively with other projects.

The air monitoring station at Carrick-on-Shannon is closer to the site than either Cavan town or Letterkenny. The suitability of such urban centres for a site in a rural area is questioned.

This assessment shall identify the potential impact of the proposed wind farm on air quality within the study area. As the proposed site is in a rural area, the relevant EPA Air Quality would be considered Zone D. The Assessment should compile all data from Zone D stations to determine the current and historical air quality across the study area. There are a number of Zone D stations across the country which can be considered representative of the study area.

A desktop review of the study area should be undertaken to identify the locations and proximities of the nearest human receptors. Identification of relevant ecological receptors (e.g., European Sites network, (p)NHAs or sensitive habitats) should also be undertaken as part of baseline data-gathering, with reference to the ecology chapter(s) of the EIA. The potential for dust impacts from on-site activity throughout the construction and decommissioning phases should be assessed in this chapter with reference to the Dust Risk Assessment Methodology presented in the NRA *Guidelines for the Treatment of Air Quality during Planning and Construction of National Road Schemes* (NRA 2011). Traffic impacts associated with the construction will be assessed using the techniques outlined in the UK Design Manual for Roads and Bridges (DMRB). With regard to impacts on air, it is considered that this will be particularly relevant during the site preparation and construction phases of development. The EIAR should therefore provide appropriate and up-to-date baseline data and describe any mitigation measures deemed necessary to minimise adverse impacts on air quality in the vicinity of the site and to mitigate dust and airborne pollution.

12. **Climate**
The EIAR shall identify, describe and assess the potential significant direct and indirect effects on climate arising from the construction, operation and decommissioning of the proposed development and cumulatively with other projects.

20. **Risks of Major Accidents or Disasters**

It is noted that there is no reference in the scoping report to the potential for major accidents or disasters occurring. The inclusion of such consideration is required in light of the recent Storm Éoywn. This assessment will consider the vulnerability of the proposed development to risks of major accidents and/or disasters and the potential for the proposed development to cause accidents and disasters and the subsequent risks to human health, cultural heritage or the environment.

Annex IV point 8 requires:

> '*A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned.*'

The Guidelines on the Information to be Contained in EIA Reports (EPA, 2022) elaborate on risk assessment further:

> '*To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk) (section 3.7.3 of EPA, 2022)*.'

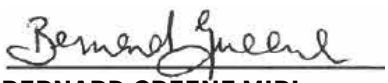
Conclusions

The applicant shall engage/liaise with the relevant authorities and regulatory bodies in relation to such assets to inform the preparation of the EIAR and associated planning consent application documentation, and detail agreed or suitable mitigation measures with the EIAR where impacts arise on such assets as a result of the proposed development.

It is respectfully requested that you take into consideration the comments listed above and liaise with other prescribed bodies and regulatory authorities with the relevant expertise in the above environmental factors in the preparation of the EIAR.

Is mise, le meas,

Yours sincerely,



BERNARD GREENE MIPI
SENIOR PLANNER
PLANNING DEPARTMENT

Comhairle Chontae Liatroma
Leitrim County Council

ADDENDUM TO COMMENTS FROM LEITIM COUNTY COUNCIL

As advised under separate correspondence, the matter of the EIAR Scoping Request was brought up at a meeting of the Manorhamilton Municipal District in December last. Arising from this discussion, the Save Dough Mountain grouping made a submission to the Planning Authority with regard maters to be considered in the Environmental Impact Assessment Report (EIAR). Leitrim County Council is happy to accommodate the request from the local community with regard to the matters to be considered in the preparation of the EIAR for the proposed project. Certain matters contained therein are perhaps more relevant to Appropriate Assessment (points 2 & 5) whilst point no. 7 is possibly not of relevance to an EIAR but are still of importance to the ultimate planning consent process.

I attach for your information and consideration the details which were forwarded to us noting that the Planning Authority would support the inclusion of such considerations in the EIAR.

Dear Sir/Madam,

Save Dough Mountain wishes to formally raise concerns regarding significant environmental, ecological, and technical factors that require thorough assessment in relation to the proposed Lissinagroagh Wind Farm development by FuturEnergy Ireland DAC. Given the sensitivity of the Dough Mountain region, it is imperative that all relevant impacts are identified and addressed comprehensively to safeguard the local environment, biodiversity, and community interests.

We believe the following points must be incorporated into the Environmental Impact Assessment Report (EIAR) scoping report before it is finalised to ensure that it reflects the full scope of environmental sensitivities and potential impacts associated with the proposed development.

_____

1. **Subterranean Features and Undocumented Caves**
The Dough Mountain region is known to contain undocumented caves and other karst features. These formations are part of a complex subterranean ecosystem that could be severely affected by construction activities, including excavation for turbine foundations and access roads.

Request: We urge a comprehensive geophysical and karst survey to identify and map all subterranean features, with appropriate mitigation measures to protect these ecosystems.

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2. **Topographical Considerations and Avian Impacts**
The region's topography, including Dough Mountain's elevation of 460m and surrounding terrains, is central to understanding the potential impacts of wind turbine placement. When combined with turbine blade tip heights (up to 535m above sea level), the development poses significant risks to birds of prey and other avian species that traverse these altitudes.

Request: Accurate topographical modelling must be conducted to assess impacts on local biodiversity, including bird flight paths and potential microclimatic changes caused by turbine operations.

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3. **Peatland Management During Construction and Decommissioning**
The proposed wind farm lies within a region characterised by extensive peatlands. Excavating, storing, and attempting to restore peat during construction and eventual decommissioning presents significant ecological and technical challenges.

Request: Clear, practical plans for peat extraction, storage, and rehabilitation must be developed, addressing the risks of peat destabilisation, erosion, and habitat loss. A long-term plan for the rehabilitation of disturbed peatland post-decommissioning is essential.

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4. **Hydrological Connectivity and Watercourse Impacts**
The Dough Mountain region includes watercourses connected to sensitive ecosystems such as Lough Gill SAC and Lough Melvin SAC. Construction and operation of the wind farm could alter hydrological patterns, increase sedimentation, and introduce pollutants into these waterways.

Request: Detailed hydrological studies are needed to assess the project's impact on water quality and flow patterns, particularly downstream effects on designated Special Areas of Conservation (SACs).

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5. **Biodiversity Surveys and Cumulative Impact Assessment**
The region supports species of conservation concern, including the Marsh Fritillary butterfly, Hen Harrier, and Buzzard. Existing ecological data appears incomplete, and cumulative impacts from other developments in the vicinity may not have been adequately considered.

Request: Comprehensive biodiversity surveys must be conducted to establish a full baseline for protected species, and cumulative impact assessments must be performed to evaluate the broader ecological implications of the wind farm.

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6. **Visual and Landscape Impact**
The visual impact of the proposed development on the surrounding uplands, including Dough Mountain's natural heritage and scenic views, requires detailed evaluation. Given the project's scale, careful attention must be paid to landscape sensitivity and cultural heritage.

Request: Detailed visual impact assessments, including photomontages and Zones of Theoretical Visibility (ZTV) maps, should be produced to illustrate the project's effects on sensitive viewpoints and local landmarks.

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7. **Community and Public Engagement**
Meaningful consultation with local stakeholders is essential to ensure transparency and address community concerns about the project's potential impacts.

Request: We encourage the implementation of a robust consultation process that includes workshops, public forums, and transparent reporting of feedback from local communities and landowners.

B3 - P.21/110 Temporary 100 m Mast Further Information Request

Essential planning-history evidence showing that further information was required for the 100 m mast, including ground conditions, upland bog, Shass Mountain, birds and bog slippage.

9th July 2021 P.21/110 071 9650450

"Planning Queries"- Joseph Duffy

REGISTERED POST

Coillte Cuideachta Ghníomhaíochta Ainmnithe
Tobin Consulting Engineers
Block 10-4
Blanchardstown Corporate Park
Dublin 18
D15 X98N

Re: **Planning Application for PERMISSION to consist of the erection of a 100m meteorological mast that will be fixed to the ground by guy wires, together will all ancillary site works for a period up to 2 years for the purpose of measuring local climate conditions and collecting meteorological data at Boleyboy, Co Leitrim.**

A Chairde,

In considering this application, it has been found necessary to request further information under the provisions of Article 33 of the Planning and Development Regulations 2001 as amended. This further information request is set out in the attached form overleaf and is essential for a full and proper evaluation of the submitted planning application.
The 4 week period for making a decision on the planning application after requesting further information does not begin until the Planning Authority considers that the further information request has been fully complied with.

You are further advised that under Article 33 (3) of the Planning & Development Regulations 2001 as amended, where a requirement to submit further information is not complied with in full [i.e. where all of the further information requested has not been fully and comprehensively replied to], the planning application shall be **declared to be withdrawn** after the period of six months from the date of this letter **9th 2021** - the initial request for further information. The last date for receipt of Further Information is 17th **January 2022.** This six month time limit cannot be extended by way of submitting a partial or incomplete response to the initial request for further information. Where the collation of the response to this further information request might take longer than 6 months e.g. in the case of an application accompanied by an Environmental Impact Statement or other, an additional period not exceeding 3 months may be agreed with the consent of the Planning Authority.

Appendix C - Essential Documents

Technical Reports and Case Studies Bundle

Joseph Sheerin Submission / Observation

Proposed Lissinagroagh Wind Farm

Planning Reference: PAX12.324290

Current Wind Farm Application: ACP-323048-25

Design Flexibility / 10-Year Permission: ACP-323910-25

Grid Connection: ACP-323353-25 - separate application but directly related

Date: 7 July 2026

Purpose of this reduced bundle

This reduced Appendix C contains only the essential technical documents and key extracts relied on in the submission. It removes duplicate and less essential material from the larger Appendix C bundle while retaining the core evidence on peat instability, landslide risk, forestry, wind farm access roads, emergency response, watercourse pollution and connected catchments.

Essential contents

C1 - Croagh Wind Farm Inspector Report - key extracts

Comparable upland wind farm refusal evidence on peat/spoil volumes, repositories, borrow pits, drainage, landslide risk, stone buttresses, pollution risk, protected birds and refusal reasons.

C2 - Garvagh Glebe Peat Slide Emergency Response Plan

Direct Leitrim wind farm / forestry evidence on peat failure risk to rivers, emergency response, barriers, access, workers and watercourse protection.

C3 - Forest Service - Sligo/Leitrim Bog-Slide Records

Short regional evidence on bog-slide risk in the wider Sligo/Leitrim upland context.

C4 - Dykes 2022 Peat Landslide Paper

Published scientific evidence on recent Irish peat landslides, including Boleybrack/Shass Mountain, Meenbog Wind Farm, forestry influences, access roads and downstream pollution.

C5 - Watercourses in the Community - key extracts

Supports the argument that small streams, drainage routes and catchments must be treated as connected systems and that pollution/flooding must be prevented at source.

This bundle should be uploaded after the main submission, attachment list, photograph evidence and Appendix B correspondence bundle.

C1

Croagh Wind Farm Inspector Report - Essential Extracts

Key extracts from the Croagh Wind Farm Inspector Report showing comparable refusal-level concerns about peat/spoil volumes, repositories, borrow pits, drainage, groundwater, stone buttresses, landslide risk, water pollution, Garvagh Glebe, protected birds and refusal reasons.

Extract note: Only the essential pages are included to keep the submission manageable.

Source file: Inspector’s Report CROAGH WIND FARM ABP-310788-21 ABP-310789-21 .pdf

Development Location

Inspector’s Report ABP-310788-21 ABP-310789-21

Wind Farm

Bargowla, Boleymaguire, Braudphark, Derreens, Derrybofin, Derrycullinan, Derrycullinan Beg, Drummanacappul, Garvagh, Garvagh Glebe, Glassalt, Lisfuiltaghan, Seltan, Sheena and Tinnybeg, County Leitrim

Carrowmore & Carrownyclowan, County Sligo

Leitrim & Sligo County Councils

Leitrim – 20120 Sligo - 20251

Coillte CGA Permission
Grant
First & Third Party

Coillte CGA
Wild Ireland Defence CLG Wind Aware Dromahair

Planning Authority
Planning Authority Reg. Ref.

Applicant
Type of Application Planning Authority Decision Type of Appeal Appellant(s)

ABP-310788/789-21

Inspector’s Report

Observer(s)

Alannah Caffrey

Adrienne Diamond & Graham Robertson

Andrea Rankin & Others Brigitte Christoph
Eileen Gibbons
Gordon Hutchinson Kevin Duffy

1. 7.7.1. It is estimated by the applicant that the quantity of peat requiring management on this site arising from the construction of the proposal

is estimated to be 196,860m . This gives a total of 406,830m^3. This is

an enormous volume of material requiring handling, storage and management. The applicant is proposing to dispose of this material in the worked out borrow pit and in two repositories on a peat-dominated,

2. 7.7.2. As rock is being extracted from the borrow pit, upstands of rock are proposed to be left in place, depending on the type of rock, to act as intermediate retaining buttresses. Where this is not achievable, stone buttresses are to be constructed within the borrow pit. In my opinion, it is extraordinary that the applicant does not know at this stage how a primary waste repository for this proposed development is intended to be finally constructed. Furthermore, it appears that the applicant is somewhat unsure about the type of rock intended to be extracted at this borrow pit location. One could not reasonably be assured that the handling, management and storage of this waste material will be carried out in a safe manner and will be sustainable for the lifetime of this wind farm at this upland location. I wish to impress upon the Board that this feature of the proposed development poses a serious pollution, health and safety risk.
3. 7.7.3. In addition to the borrow pit, the spoil is to be put into two repository areas, one at the north-western end of the site and one at the south-eastern end. These are to be areas on the site that would be contained by constructed stone buttresses. The heights of the stone buttresses would be higher than the stored peat and spoil, with the buttress for the north-west repository being up to 7 metres in height, while the buttresses for the south-west repository would be up to 6 metres in height. These buttresses are intended to be constructed of well-graded granular rock fill of about 100mm up to 500mm in size. Alternatively, drains are proposed to be placed through the buttresses to allow excess water to drain. Interceptor drains are also intended to be provided upslope of the repositories and settlement ponds are proposed at the lower sides of these repositories. Based upon the details in this application, it is

apparent that the applicant remains unsure about how these repositories are intended be drained, which is a critically important design feature of this development that is intended to store huge volumes of material for the long-term. This is compounded by the applicant's lack of understanding of whether or not measures will be required for the control of groundwater (an issue which is intended to be determined as part of the ground investigation programme). It is also apparent from the design proposals that that the applicant is unsure about the type and condition of rock at these repository locations. In the event of the failure of providing for appropriate drainage of these repositories, it is apparent that the difficulties with containment and ponding of excess water would arise, that a build-up of pressure would be likely, and the potential failure of the repositories would be a realistic outcome. I am particularly concerned about proposed repository no. 2 and its siting on a hillside, the necessity of clear felling of forestry, and the peat-dominated nature of the soils at the repository locations.

7.7.4. It is evident that the applicant is going to extensive lengths to try to engineer the provision of repositories to contain a vast volume of spoil in upland where there is extensive blanket bog and where the applicant is evidently unsure about groundwater, rock and water conditions affecting this site. This poses a real pollution, health and safety risk. The vulnerability of this area to peat slides, as evidenced by an incident on the immediately adjoining Garvagh Glebe wind farm site at its construction stage, should not go unmissed when assessing the potential environmental threats posed by this proposed wind farm. In giving background to this event, I wish to draw the attention of the Board to Inland Fisheries Ireland's scoping response to the applicant set out in Appendix 2-1 of the EIAR. Therein, it was stated:

"*In September 2008, the Owengar River was severely polluted as a result of a catastrophic landslide caused by construction activities in association with wind farm and site road construction close to the Upper reaches of the Owengar River in Garvagh Glebe, Drumkeerin, Co. Leitrim. Water samples showed the impact of the pollution spread downstream through the Owengar River as far as Lough Allen over 9 kilometres downstream. The resulting pollution resulted in a fish kill of thousands of fish, mainly brown trout. The peaty material which was displaced into the*

watercourse led to the destruction of fisheries habitat on a massive scale. It will take many years for the impacted section of the river to recover.

IFI is seriously concerned over the potential for landslides in this area, based on the occurrence of two landslides in close proximity to this site during the construction and clear felling for the neighbouring Garvagh Glebe windfarm, which resulted in significant damage to the fisheries resource and water quality in the Owengar River. The Geological Survey of Ireland have also identified numerous landslides in this area, indicating significant risks from activities involved (sic) large scale earth works such as windfarms."

5. 7.7.5. It is apparent from all of the applicant's submissions on the Garvagh Glebe significant pollution event arising from the construction of that wind farm that the applicant has been unable to adequately determine the reasons why that landslide occurred. The risk arising from the proposed development is evident.
6. 7.7.6. Finally, the Board should also have regard to my considerations on drainage, and on soils, geology and water in the Environmental Impact Assessment section of my assessment. The stability of the proposed structures to contain the vast volumes of waste material arising from the proposed development is called into question in this instance. This is further exacerbated by the form and pattern of recent landslides in the immediate vicinity.

Site Drainage

- - Bedrock at the borrow pit was met at 2.2m.
- - There are numerous mapped faults in the area. Two north-east / south-west trending faults have been mapped within the site.
- - The applicant's peat stability assessment concluded that the site at the infrastructure locations has an acceptable margin of safety and is suitable for the proposed development. Analysis of 324 locations showed the site generally has an acceptable margin of safety. For both the drained and undrained condition, 324 locations showed an acceptable Factor of Safety of greater than 1.3 except for 8 no. marginally low Factors of Safety. These were typically located alongside existing access roads. Two were also located along the proposed access road to Turbine 9, coinciding with a deep pocket of peat.
- - The estimated volume of peat to be extracted is 209,970m^3. The turbines and access roads would require excavation of 169,425m^3 of peat. The estimated volume of other spoil to be excavated is 196,860m^3. This gives a total of 406,830m^3.
- - The volume of rock to be excavated from the borrow pit is estimated to be 372,600m^3.
- - The volume of waste materials to be stored in the borrow pit and two repositories is estimated to be 398,000m^3.
- - The applicant submits that there will be no loss of peat or subsoil, it will just be relocated within the site (Section 8.5.2.1 of EIAR).

The main factors that influence peat stability are slope angle, shear strength of peat, depth of peat, pore water pressure, and loading conditions. I note the huge volumes of peat and other materials proposed to be excavated for this development and

proposed to be moved and deposited in the borrow pit and the two repositories. I note the significant depths of peat at some turbine locations and along sections of proposed new access roads. I note the marginally low Factors of Safety alongside existing and proposed access roads, particularly along the proposed access road to Turbine 9, where some of the deepest areas of peat prevail. I note the low permeability of the limestone bedrock at this location, leading to a high water table. I note that there are 55.1 hectares of trees proposed to be felled to accommodate the new development, with this plantation growing predominantly on peat and these soils and subsoils being subsequently exposed. I note numerous mapped faults in the area, including two within the site. I note the upland nature of the terrain and the high rainfall levels to be expected in this location. I note that there is a high density of drainage channels throughout this site, both natural and man-made.

I must impress the Board that this is a major intrusive industrial project on this upland bogland location. The volumes of material proposed to be excavated, and peat in particular, on this upland are vast. The instability associated with the works and movement of waste material and the methodology of

attempting to transport such volumes of peat (being primarily water), together with the dumping of the waste peat and other materials in three large holes on this site on a hill in bogland terrain poses a serious threat to health, safety and the environment. The interference with the natural terrain by the development of the turbine bases, the hardstanding areas, the construction of access roads cutting across the contours on bogland and providing preferential flow paths for surface waters, and the development of other infrastructure is incomparable in terms of intrusion with any commercial forestry plantation heretofore. I further note that this is an area where there have been previous peat slides and where, in the immediate vicinity of this site, there has been a landslide from the construction of another wind farm development. The landslide at the Garvagh Glebe wind farm site has already been noted previously. The Board will also note from the applicant's Geotechnical & Peat Stability Assessment Report, forming Appendix 8-1 of the EIAR, that there has been a high density of historical landslides in this area and that there have been three historical landslides within the site itself. I note again the landslide at the construction stage of the Garvagh Glebe wind farm and I acknowledge that there has since been a further landslide in this area in June 2020 in the vicinity of the Dawn of Hope Bridge to the north-east of the

site and north of Lough Allen on a low slope and after a period of heavy rainfall. The applicant's report highlights the evident susceptibility of the proposed site to landslides and indicates extensive parts of this site which are at significant risk at the construction stage in the immediate vicinity of several turbines and access roads.

I impress upon the Board that this site is classified by Geological Survey Ireland as being of low to moderately high landslide susceptibility. In my opinion, the risk of significant environmental damage arising from peat slides is too great on this site. This is not something that can be readily engineered after proposing to marginally avoid areas of significant risk. There must be serious concerns about peat erosion, peat instability, localised movement of peat, and ultimately peat failure on this site with a development of this nature, particularly from clear felling followed by the construction of the turbine bases and the development of the access road network traversing the contours of this upland site. At times of heavy rainfall, preceded by a prolonged dry spell, when water is channelling down through this site, when felling is underway and excavation is occurring through the peatland, the proposed strict adherence to management plans and drainage control measures can, and will be, seriously challenged on this site. The proposed development is most likely, in my opinion, to pose a significant adverse environmental impact arising from peat failure and ultimately a landslide. The Board will note from the applicant's EIAR the concerns from Inland Fisheries Ireland, Geological Survey of Ireland, and Irish Peatland Conservation Council (IPCC) in the scoping responses received by the applicant on soils and geology and water. I have referenced IFI concerns previously in my planning assessment. IPCC could not support the development due to little intact bog being left in County Leitrim, its location within a vast area of protected reserves, loss of habitat,

managed on this site. This upland blanket bogland area is prone to landslides, with a history of landslides occurring on and in the immediate vicinity of this site. The proposals to excavate a borrow pit and repositories and to seek to contain and store extensive volumes of peat and other spoil material on this upland mountainside, the development of access tracks across deep areas of peat, the construction of turbines and hardstanding areas on bog, the removal of extensive conifer plantation, and the provision of a highly complex drainage system would result in a significant pollution threat to waterbodies and the wider environment resulting from a landslide.

- An extensive range of birds of conservation value have been observed on, over and in close proximity to the site in the applicant's surveys, indicating that this is an area of significant ornithological value. It is also an area under significant pressure from existing wind farm development, with 13 existing wind farms less than 8km from the site, providing a total of 107 turbines, several of which adjoin the site. The potential for further habitat loss, displacement, and collision risk by yet more turbines arises. This adverse cumulative ornithological impact is compounded by the proposed turbines being significantly higher and larger in scale than the average turbines existing at present at this location, posing a notably greater risk of collision and avian displacement. The cumulative impact would be significant.
- The proposed development would result in significant adverse landscape and visual impacts arising from the siting, scale and height of the proposed turbines, and the cumulative impact with the extensive array of established turbines in the immediate vicinity. The proposed development would be highly prominent over an extensive geographical area, would have a dominant, obtrusive, skyline impact on visually and environmentally sensitive landscapes, and would impact on the amenity and tourism value of the area. The proposal would significantly add to the extent of turbines on the existing ridgeline and it would expand the linear spread north-westwards in the direction of valued scenic, tourist and amenity locations. This cumulative impact and siting of the proposed development would contribute further to the erosion of the quality of the natural landscape.

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The submitted EIAR has been considered with regard to the guidance provided in the EPA documents 'Guidelines for Planning Authorities and An Bord Pleanála on Carrying our Environmental Impact Assessment' (2018), 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (draft August 2017), and 'Advice Notes for Preparing Environmental Impact Statements' (draft September 2015). It is noted that Article 3 (2) of Directive 2014/52/EU requires that:

'The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and / or disasters that are relevant to the project concerned'.

- The excavated spoil is to be disposed of in a worked out borrow pit and in two repositories. There is no clear understanding of how the primary waste repository is intended to be finally constructed and there is lack of clarity about the type of rock intended to be extracted at this borrow pit. Furthermore, the applicant is unsure about the type and condition of rock at the repository locations, how the repositories are intended be drained, and whether or not measures will be required for the control of groundwater.
- The very precise nature of very expansive proposed drainage measures in a peat-dominated environment is noted.
- The destabilising impacts of proposed engineered drainage works are noted, together with clear felling, at a sensitive upland location, where there are concerns about the functionality of the proposed provisions, the timing of construction works, and the ability to adequately manage and maintain such drainage infrastructure.

  In my opinion, the above results in a clear concern that entrainment of suspended solids and the release of nutrients to waterbodies arising from peat failure and a landslide is a distinct concern with this proposal, with potential significant effects for

Lough Gill SAC which has hydrological connectivity with Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and Cummeen Strand SPA.

9.2.4. **Potentially Significant Cumulative Effects**

I note Section 7 of the applicant's NIS wherein a review of plans and projects with the potential to result in cumulative and/or in-combination effects was undertaken. This included a review of the relevant provisions of Leitrim, Sligo and Roscommon County Development Plans, forestry, and other existing and proposed wind farm developments in the wider area. The recent construction of the Garvagh Glebe wind farm and the landslide resulting from these works have already been referred to in my assessment. The proposed development individually poses a significant threat from a landslide and, thus, would potentially be likely to adversely affect the integrity of Lough Gill SAC. The occurrence of a significant environmentally damaging landslide on the adjoining lands indicates that there is a real threat posed by the proposed development.

9.2.5. **Mitigation**

Section 5 of the applicant's NIS details the range of mitigation measures intended to be employed as part of the proposed development. The measures include mitigation by design, construction methodologies, drainage management, culvert upgrading, handling of hydrocarbons and waste material, control measures for cement, peat stability management, and monitoring.

turbines north-westwards in the direction of valued scenic, tourist and amenity locations, which would contribute further to the erosion of the quality of the natural landscape.

The Board completed an environmental impact assessment in relation to the proposed development and concluded that the effects of the development on the environment, by itself and in combination with other plans and projects in the vicinity, would not be acceptable due to the health and safety risks and the environmental impacts arising from a potential landslide, the impact on protected bird species, and the adverse landscape and visual impacts. In doing so the Board adopted the report and conclusions of the inspector.

Having regard to the conclusions drawn in my planning assessment, the assessment of environmental impacts and my assessment of likely significant effects on European sites, I recommend that permission is refused for the proposed development for the following reasons and considerations:

Reasons and Considerations

1. Having regard to:

1. (a) The classification of the site by Geological Survey Ireland as being of low to moderately high landslide susceptibility;
2. (b) The high density of historical landslides in this area, including three landslides within the site itself;
3. (c) The numerous mapped faults in the area, including two within the site;
4. (d) The upland and sloping nature of the terrain;
5. (e) The high rainfall levels prevalent in this location;
6. (f) Blanket bog being the dominant soil type at the site;
7. (g) The low permeability of the limestone bedrock on the site, leading to a high water table;
8. (h) The high density of drainage channels throughout the site, both natural and man-made;
9. (i) Thetimingofconstructionworksoutsideofthebreedingseasonforbirds coinciding with wetter periods;
10. (j) Theexpansiveareasoftreestobeclearfelled,withpeatsoilsandsubsoils subsequently exposed;
11. (k) The extensive water crossings and crossing upgrades required;
12. (l) Thedeeppeatatturbinelocationsandalongexistingandproposedaccess roads;

(m)The significant volumes of peat and other spoil material requiring excavation, handling, storage and management on the site;

14. (n) The instability associated with the works and movement of waste material, including the necessity for placement of vast volumes of waste peat and other spoil materials in three large repositories on bogland hilly terrain;
15. (o) The construction of high retaining stone buttresses required to contain waste peat and other spoil;

(p) (q)

The peat-dominated nature of the soils at the repository locations;

The lack of a clear understanding of the land and ground conditions associated with the development of the proposed peat repositories, including matters relating to the final construction of the primary repository, the drainage of the peat repositories, measures required for the control of groundwater, the type and condition of rock at the repository locations, and the hillside siting of the northernmost repository and the associated clear felling of forestry;

The construction works culminating in interference with the natural terrain by the development of the turbine bases and the hardstanding areas, the construction of access roads cutting across contours on bogland, the provision of preferential flow paths for surface waters, and road widening and improvement works along existing internal roads;

The proposed highly complex system of drainage and the very precise nature of the application of many of the proposed measures required for their functionality; and

The destabilising impacts of the proposed engineered drainage works,

(r)

(s)

(t)

it is
landslide associated with the proposed wind farm, the proposed development would pose a serious danger to the environment, potentially causing extensive pollution of waterbodies within and in the vicinity of the site. Furthermore, the Board is not satisfied that the proposed repositories would be effective in providing for the permanent retention of peat and other unsuitable materials and that the mitigation measures, inclusive of the proposed complex drainage system, would be adequate to ensure the protection of the environment. Therefore, it is considered that the proposed development would present a significant risk of adverse environmental impact on the sensitive natural habitats of the site and of the wider area, constituting an unacceptable risk of pollution of watercourses in the area and seriously injuring the amenities of

C2

Garvagh Glebe Peat Slide Emergency Response Plan

This document is retained because it is direct local/regional evidence of peat failure risk associated with wind farm/forestry works and rivers at risk. It supports the objection on emergency response limits, watercourse risk, barriers, worker safety and the need to prevent peat failure at source.

Source file: LM080009-AUGUST 2009 GARVAGH GLEGE WIND FARM - PEAT SLIDE EMERGENCY RESPONSE PLAN FOR RIVERS AT RISK FROM PEAT FAILURE AS A RISK OF TREE FELLING OPERATIONS.pdf

August Report -

PEAT SLIDE EMERGENCY RESPONSE PLAN FOR RIVERS AT RISK FROM PEAT FAILURE AS A RESULT OF TREE FELLING OPERATIONS

GARVAGH GLEBE WIND FARM

Prepared for:

Coillte

August 2009

AGEC Ltd
The Grainstore
Singletons Lane
Bagenalstown
Co. Carlow
Ireland

E-mail: info@agec.ie

DOCUMENT APPROVAL FORM

Document title:	Peat Slide Emergency Response Plan For Rivers at Risk from Peat Failure as a Result of Tree Felling Operations		
File reference Number:	860_063	Document Revision No.	2

Note: Amendments marked with line in right-hand margin

File Reference Number	Document Revision No.	Amendment/Comment

Task	Nominated authority	Approved (signature)
Prepared by	Authors: Paul Jennings	Paul Jennings
Checked by	Geotechnical Project Manager: Paul Jennings	Paul Jennings
Approved by	Geotechnical Project Director: Turlough Johnston	T. Johnston
Quality check	Quality Manager: Marion English	Marion English

TABLE OF CONTENTS

1 INTRODUCTION

The purpose of this report is to identify the risk to rivers in the vicinity of the Garvagh Glebe North and South sites from peat failure as a result of tree felling operations and to provide mitigation measures in the form of a peat slide emergency response plan.

This report includes the following:

(1) Identification of rivers at potential risk

(2) Risk assessment

(3) Mitigation measures – peat slide emergency response plan

2 RIVERS AT POTENTIAL RISK

The rivers and associated tributaries that may be affected by a peat failure are shown in Appendix A on drawing nos. P378021-F023-014-D-0051 and 052. (Note zones given in drawings relate to the emergency response plan and not the QRA zones.)

For the Garvagh Glebe North site the following rivers and associated tributaries are given:

- Owengar River. This drains the eastern and northeastern part of the site. There are 7 tributaries rising near the site. From the headwaters to where the river enters Lough Allen the estimated river length is 10km.
- Arigna River. This drains the southern part of the site. There is 1 tributary that rises near the site. The tributary flows for about 2km before its confluence with the main river. From the confluence to where the main river enters Lough Allen the estimated river length is 20km.
- Bonet River. This drains the northwestern and western parts of the site. There are 3 tributaries that rise near the site. The tributaries converge after about 2.5km at a location upstream of the public road crossing approx 1 km SW of Killavoggy Bridge. After about a further 10km the combined tributary river enters the main river before flowing into Lough Gill. From the headwaters to where the river enters Lough Gill the estimated river length is 19km.

For the Garvagh Glebe South site the following rivers and associated tributaries are given:

- Owengar River. This drains the northern part of the site. There are 2 tributaries rising near the site. From the headwaters to where the river enters Lough Allen the estimated river length is 10km.
- Arigna River. This drains the southern part of the site. There is 1 tributary that rises near the site, and the main river also passes downslope of the site. The tributary flows for less than 1km before its confluence with the main river. From the confluence to where the main river enters Lough Allen the estimated river length is 19km.

3 RISK ASSESSMENT

3.1 Methodology for Risk Assessment

A risk assessment with respect to peat failure as a result of tree felling has been carried out for the rivers in the vicinity of the proposed wind farm development. This approach follows the guidelines for geotechnical risk management as given in Clayton (2001).

The risk assessment uses the results of the QRA score obtained from AGEC report entitled *Report on Quantitative Risk Assessment of Peat Stability During Tree Felling - Garvagh Glebe Wind Farm* dated July 2009.

3.2 Probability

The likelihood of a hazard (peat failure) occurring has been based on the results of the QRA score. The probability assigned to the QRA score is judged on a qualitative scale (Table 1).

Table 1 Probability Scales

Scale	Risk Rating Without Construction Impact or Appropriate Mitigation Measures	Risk Score	Probability of Failure
1	Not Applicable	< 40 %	Least
2	Negligible	40-50 %	
3	Low	51-60 %	
4	Possible	61-70 %	
5	Very Possible	71-75 %	
6	Likely depending on construction impacts and without appropriate mitigation measures	>75 %	Greatest

3.3 Impact

The severity of the risk posed to nearby rivers is assessed qualitatively in terms of impact. The impact of a peat failure on the river environment within and beyond the immediate wind farm site is assessed based on the potential travel distance of a peat failure. Where a peat failure enters a water course it can travel a considerable distance downstream. Therefore the proximity of a potential peat failure to a river is a significant indicator of the likely potential impact.

The risk is determined based on the combination of hazard and impact. A qualitative scale has been derived for the impact of the hazard based on distance of tree felling to a river (Table 2).

The location of rivers is based on topographic maps and supplemented by site observations from walkover survey.

Table 2 Impact Scale

Scale	Criteria	Impact
1	Proposed tree felling greater than 300m from river	Negligible/None
2	Proposed tree felling within 201 to 301m from river	Low
3	Proposed tree felling within 101 to 200m from river	Medium
4	Proposed tree felling within 100m from river	High

3.4 Risk Rating

The degree of risk is determined as the product of probability (P) and impact (I), which gives the Risk Rating (R) as follows:

The Risk Rating is calculated from: $R = P \times I$

The Risk Rating can range from 1 to 20 as shown in Table 3.

Table 3 Risk Rating

Impact (I) \ Probability (P)	1	2	3	4	5	6
4	4	8	12	16	20	24
3	3	6	9	12	15	18
2	2	4	6	8	10	12
1	1	2	3	4	5	6

Risk Rating & Control Measures

17 to 24	Unacceptable: re-location or significant control measures required
10 to 16	Substantial: notable control measures required
5 to 9	Tolerable: only routine control measures required
1 to 4	Trivial: none or only routine control measures required

Note. Where any individual probability is 6 then this defaults to an 'Unacceptable' risk rating irrespective of the impact.

In many cases a simple 4- to 5-level scale is considered sufficient (Clayton, 2001); in this case a 4-level risk scale is used.

Control measures are required to reduce the risk to at least a 'Tolerable' risk rating.

The risk rating is determined for rivers rising in or near the site that may be affected by a potential peat failure as result of tree felling.

3.5 Risk to Rivers

Table 4 shows the calculated risk (R) for the individual rivers for the Garvagh Glebe North and South sites. It is noted that a river may be affected by several zones where tree felling is proposed; therefore the risk for each zone is calculated.

The maximum risk for each river is given as R_{max}. R_{max} will determine the level of mitigation required. R_{max} ranges from nil to 16.

Table 4 Rivers and Risk Rating (R)

Garvagh Glebe North							
Main River	**Tributary Reference**	**QRA Zone**	**Distance to Tree Felling (m)**	**P**	**I**	**R**	**Rmax**
Owengar River	1	6	None	4	None	Nil	Nil
	2	9	None	4	None	Nil	Nil
	3	4	150	4	3	12	12
	4	2	<50	3	4	12	16
		4	<50	4	4	16	
		5	150	4	3	12	
		9	100	4	4	16	
	5	1	<10	3	4	12	16
		2	100	3	4	12	
		5	<10	4	4	16	
	6	5a	100	4	4	16	16
	7	5a	<10	4	4	16	16
Arigna River	1	1	220	3	2	6	12
		2	220	3	2	6	
		3	300	3	2	6	
		8	<10	3	4	12	
Bonet River	1	3	150 say	3	3	9	16
		6	<10	4	4	16	
	2	3	450	3	1	3	16
		7	<10	4	4	16	
	3	3	420	3	1	3	12
		7	150	4	3	12	
		8	80	3	4	12	
Garvagh Glebe South							
Main River	**Tributary Reference**	**Zone**	**Approximate Distance to Tree Felling (m)**	**P**	**I**	**R**	**Rmax**
Owengar River	7	1	<100	4	4	16	16
	8	1	250	3	2	6	12
		2	180	3	3	9	
		3	<10	3	4	12	
Arigna River	2	1	<10	3	4	12	12
		2	<10	3	4	12	
	3	2	450	3	1	3	3
		3	450	3	1	3	

Notes:

(1) 'None' means that should there be a failure within the tree felling area then the travel direction of the failure is such that it will not enter the river.

(2) Approximate distance to streams is based on extent of stream shown on plan and field observations. Given that the location of some stream headwaters is not well defined some distances have been estimated based on best judgment.

4 MITIGATION MEASURES - PEAT SLIDE EMERGENCY RESPONSE PLAN

A summary of the maximum calculated risk (R_{max}) for each river is given in Table 5 together with mitigation measures to be included as part of the emergency response plan.

In the unlikely event of a peat failure and as part of the emergency response measures it is intended to provide barrages at accessible locations on all rivers, that is the Owengar, Arigna and Bonet River as follows:

- The Owengar River already has existing barrages erected following the previous failure in 2008. Several other areas have been identified where barrages can be readily constructed where tributaries pass below public roads.
- On the Arigna River a barrage is proposed to be located to the west of the Garvagh Glebe North site. At this location there is sufficient space to store peat debris. A further barrage can be constructed to the northwest of the Garvagh Glebe South site, where the tributary river passes under a public road.
- The Bonet River tributaries converge upstream of the public road crossing approx 1 km SW of Killavoggy Bridge; it is proposed to locate a barrage downstream of the public road. At this location there is sufficient space to store peat debris. An additional barrage and peat storage area is proposed for the northern tributary of the Bonet River.

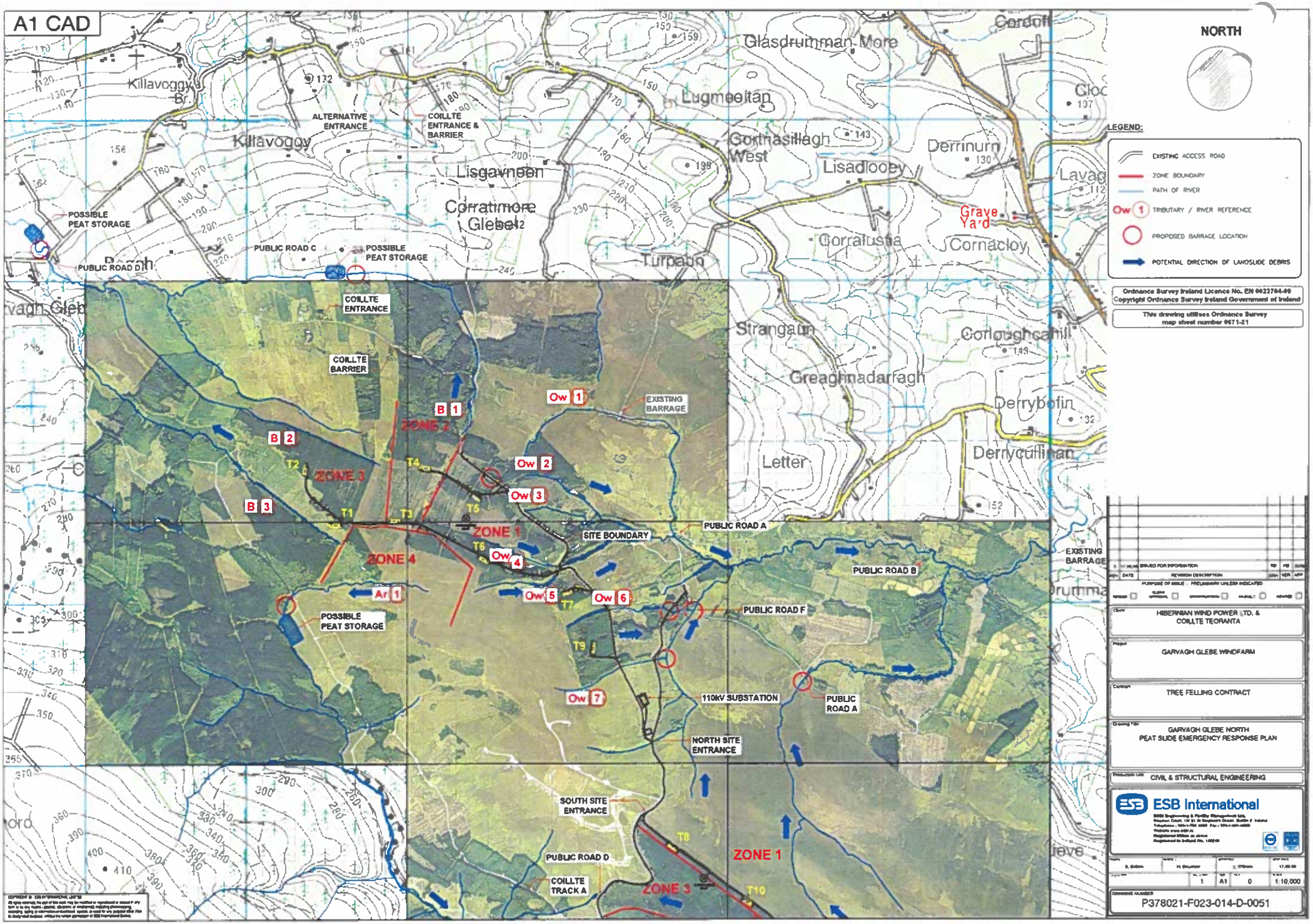
Details of location and implementation of mitigation measures is given on drawings in Appendix A and the Emergency Response Plans for Garvagh Glebe North and South in Appendix B.

Note that mitigation measures to reduce the risk of peat failure as result of tree felling operation are included in AGEC report entitled *Report on Quantitative Risk Assessment of Peat Stability During Tree Felling - Garvagh Glebe Wind Farm* dated July 2009.

Table 5 Rivers and Mitigation Measures

Garvagh Glebe North				
Main River	**Tributary Reference**	**Rmax**	**Mitigation Measures Required**	**Mitigation Measures**
Owengar River	1	Nil	No	Refer to drawing no. P378021-F023-014-D-0051
	2	Nil	No	
	3	12	Yes	
	4	16	Yes	
	5	16	Yes	
	6	16	Yes	
	7	16	Yes	
Arigna River	1	12	Yes	
Bonet River	1	16	Yes	
	2	16	Yes	
	3	12	Yes	
Garvagh Glebe South				
Main River	**Tributary Reference**	**Rmax**	**Mitigation Measures Required**	**Mitigation Measures**
Owengar River	7	16	Yes	Refer to drawing no. P378021-F023-014-D-0052
	8	12	Yes	
Arigna River	2	12	Yes	
	3	3	No	

APPENDIX A


A1 CAD
NORTH
LEGEND:
EXISTING ACCESS ROAD
ZONE BOUNDARY
PATH OF RIVER
Ow 1 TRIBUTARY / RIVER REFERENCE
PROPOSED BARRAGE LOCATION
POTENTIAL DIRECTION OF LANDSLIDE DEBRIS
Ordnance Survey Ireland Licence No. EN 0023704-09
Copyright Ordnance Survey Ireland Government of Ireland
This drawing utilises Ordnance Survey map sheet number 0671-21
Killavoggy
Killavoggy Br
ALTERNATIVE ENTRANCE
COILLTE ENTRANCE & BARRIER
Lisgavnoon
Corratimore Glebe
Glasdrummanmore
Lugmeelan
Gortnasillagh West
Derrinurn
Lisadlooey
Grave Yard
Corraluska
Cornacloy
Turpaun
Strangaun
Greaghnadarragh
Corloughcahill
Derrybofin
Derrycullinan
Letter
POSSIBLE PEAT STORAGE
PUBLIC ROAD C
PUBLIC ROAD D
COILLTE ENTRANCE
COILLTE BARRIER
EXISTING BARRAGE
B 1
B 2
B 3
ZONE 1
ZONE 2
ZONE 3
ZONE 4
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
Ow 1
Ow 2
Ow 3
Ow 4
Ow 5
Ow 6
Ow 7
Ar 1
SITE BOUNDARY
PUBLIC ROAD A
PUBLIC ROAD B
PUBLIC ROAD F
110kV SUBSTATION
NORTH SITE ENTRANCE
SOUTH SITE ENTRANCE
PUBLIC ROAD D
COILLTE TRACK A
ISSUED FOR INFORMATION
HIBERNIAN WIND POWER LTD. & COILLTE TEORANTA
GARVAGH GLEBE WINDFARM
TREE FELLING CONTRACT
GARVAGH GLEBE NORTH
PEAT SLIDE EMERGENCY RESPONSE PLAN
CIVIL & STRUCTURAL ENGINEERING
ESB International
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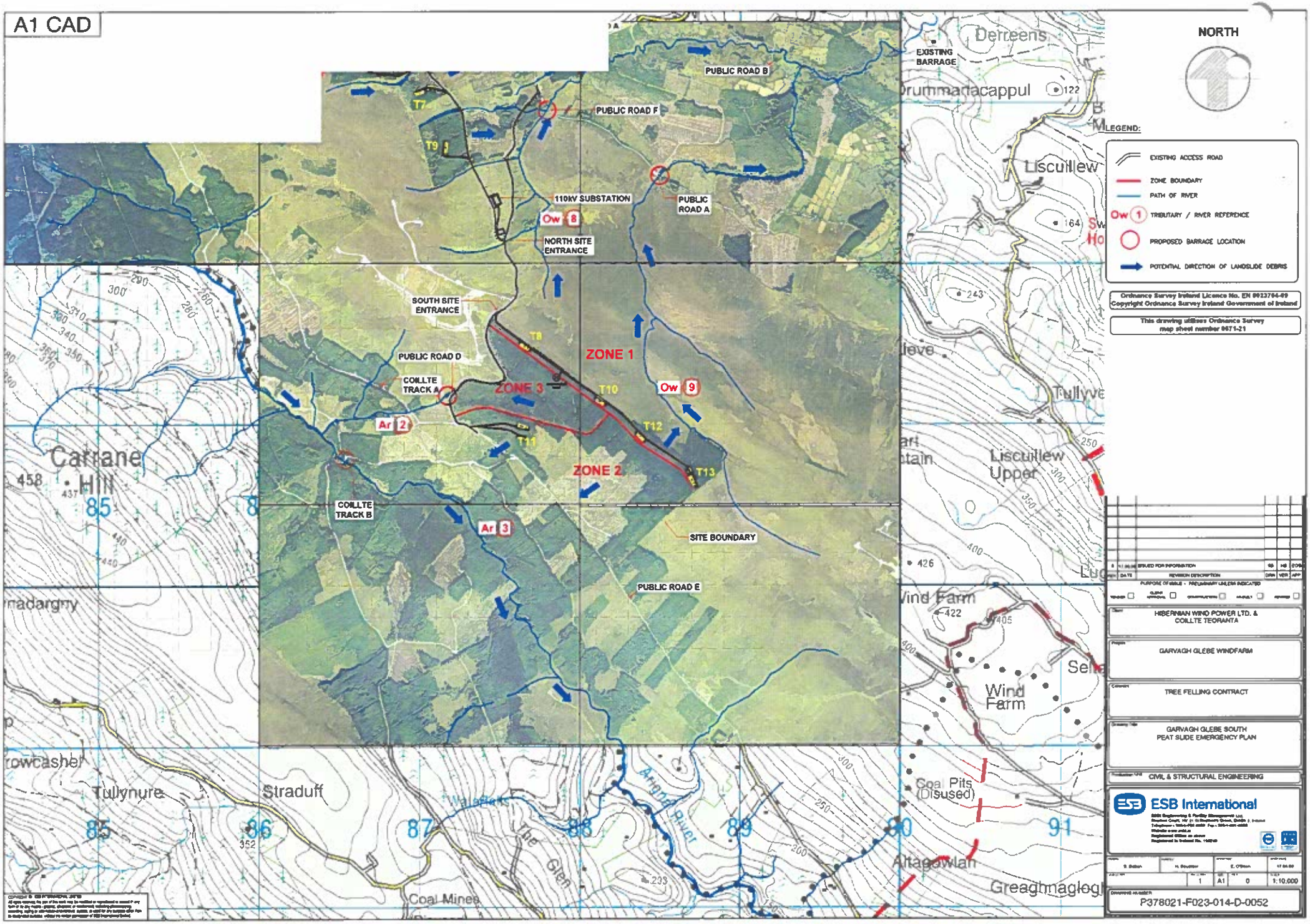
P378021-F023-014-D-0051


A1 CAD
NORTH
LEGEND:
EXISTING ACCESS ROAD
ZONE BOUNDARY
PATH OF RIVER
Ow 1 TRIBUTARY / RIVER REFERENCE
PROPOSED BARRAGE LOCATION
POTENTIAL DIRECTION OF LANDSLIDE DEBRIS
Ordnance Survey Ireland Licence No. EN 0023704-09
Copyright Ordnance Survey Ireland Government of Ireland
This drawing utilises Ordnance Survey map sheet number 0671-21
EXISTING BARRAGE
PUBLIC ROAD B
PUBLIC ROAD F
T7
T9
110KV SUBSTATION
Ow 8
NORTH SITE ENTRANCE
PUBLIC ROAD A
SOUTH SITE ENTRANCE
T8
PUBLIC ROAD D
COILLTE TRACK A
ZONE 1
ZONE 3
T10
Ow 9
Ar 2
T12
T11
ZONE 2
T13
COILLTE TRACK B
Ar 3
SITE BOUNDARY
PUBLIC ROAD E
Derreens
Drummadacappul
Liscuillew
Tullyve
Liscuillew Upper
Carrane Hill
Wind Farm
Coal Pits (Disused)
Tullynure
Straduff
Altagowlan
Greaghmaglogl
Coal Mines
The Glen
Arigna River
HIBERNIAN WIND POWER LTD. & COILLTE TEORANTA
GARVAGH GLEBE WINDFARM
TREE FELLING CONTRACT
GARVAGH GLEBE SOUTH PEAT SLIDE EMERGENCY PLAN
CIVIL & STRUCTURAL ENGINEERING
ESB International
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P378021-F023-014-D-0052

APPENDIX B

Emergency Response (Peat Slide)
Garvagh Glebe North

Drawing P378021-F023-014-D-0051 shows Zones, the location of the Turbines, the likely direction of movement of peat in the event of a peat slide occurring, the watercourses that will be affected and the locations of barrages built in the area to contain previous peat slides for the Garvagh Glebe North site.

In the event of a peat slide, the priority is to ensure that there is no injury caused to construction workers onsite, local people living or using roads in the area and that pollution of nearby watercourses does not occur. The following steps are to be taken in response to a peat slide occurring.

Emergency Actions

1. Whoever discovers the peat slide - immediately contact the Site Manager.
2. Secure local roads in the area at the required locations to ensure that local traffic cannot move into the path of the slide.

   Zone 1 – Public Road A and B

   Zone 2 – Public Road C and D

   Zone 3 – Public Road D
3. Account for all personnel working in the area – ESBI Safety Officer.
4. Utilise all personnel on site to contain the peat slide as required.
5. Move any plant in the area of the peat slide to a safer area.
6. Track movement of the peat slide either by following on foot or by viewing from a highpoint –attempt to predict its path.
7. The Site Manager or his nominee alerts the following:-

   Gardai 071-9648002

   Leitrim Co Co (Drumahare) Area Engineer, P Mc Shera 071-9164109

   ESBI Head Office 01-7038000 (J Connolly)
8. Review Peat stability on site with the objective of constructing barrages in the path of the peat slide. (Ideally in a Narrow Valley with Plant Access close by and Flat Area for emergency repository)
9. Consider additional Barrage construction downstream of the peat slide.

Garvagh Glebe South

Drawing P378021-F023-014-D-0052 shows Zones, the location of the Turbines, the likely direction of movement of peat in the event of a peat slide occurring, the watercourses that will be affected and the locations of barrages built in the area to contain previous peat slides for the Garvagh Glebe South site.

In the event of a peat slide, the priority is to ensure that there is no injury caused to construction workers onsite, local people living or using roads in the area and that pollution of nearby watercourses does not occur. The following steps are to be taken in response to a peat slide occurring.

Emergency Actions

10. Whoever discovers the peat slide - immediately contact the Site Manager.
11. Secure local roads in the area at the required locations to ensure that local traffic cannot move into the path of the slide.

    Zone 1 – Public Road A, B and F

    Zone 2 – Between Public Road D and E

    Zone 3 – Public Road D
12. Account for all personnel working in the area – ESBI Safety Officer.
13. Utilise all personnel on site to contain the peat slide as required.
14. Move any plant in the area of the peat slide to a safer area.
15. Track movement of the peat slide either by following on foot or by viewing from a highpoint –attempt to predict its path.
16. The Site Manager or his nominee alerts the following:-

    Gardai 071-9648002

    Leitrim Co Co (Drumahare) Area Engineer, P Mc Shera 071-9164109

    ESBI Head Office 01-7038000 (J Connolly)
17. Review Peat stability on site with the objective of constructing barrages in the path of the peat slide. (Ideally in a Narrow Valley with Plant Access close by and Flat Area for emergency repository)
18. Consider additional Barrage construction downstream of the peat slide.

Emergency Provisions to be In Place On Site

1. Maintain a minimum 3000 m^3 Emergency Supply of shale at all times on site.
2. An off site Emergency Stockpile to be made available at short notice from Kerrigan's Quarries, Drumkeerin (about 6 miles from Garvagh Glebe site) Kerrigan Quarries will mobilise additional transport, if required.
3. Diesel Bowser will be always be available and fuelled up at the end of each working day.
4. A supply of 30m ropes/life buoys in plant engaged in active earthworks construction to aid the rescue and retrieval of persons at risk of entrapment or engulfment.
5. A trailer containing pallets, planks, ropes etc. will be on site so that in the event of a peat slide these could be transported immediately to an area if any personnel were to become engulfed / trapped.
6. Sufficient Mobile Tower Lighting available from November to February due to fewer hours of daylight. (servicing both site and public roads)
7. ESBI will have keys to all Coillte barriers / gates available.
8. A laminated copy of page 1 of the emergency plan and drawings P378021-F026-01-D-0051 & 0052 are placed in each excavator, truck, and jeep etc. working on the Garvagh Glebe site.
9. Emergency Drill to take place in order to familiarise site staff with plan.

C3

Forest Service - Sligo/Leitrim Bog-Slide Records

This short record is retained because it supports the regional context of bog-slide and peat-failure risk in Sligo/Leitrim upland landscapes.

Source file: LM080009-Forest Services Sligo-Bog Slides in Sligo Leitrim.pdf

Forest Service,
Government Offices,
Cranmore,
Sligo.
09/03/09

RE : GFL SO100009:
GFL LM060009:
GFL LM080009.

M r.Crowe,
Forest Service,

Lest it has escaped your notice there has been a substantial number of landslides/ bogslides in the Sligo –Leitrim area during the past winter months, some reported in the national media. One of the landslides reported on was in the proposed wind turbine/road construction/ felling area proposed near Drumkeeran. It was reported on TV that no work was taking place at the time of the slippage. This only serves to illustrate the fragile nature of the sites.
In this mountainous area climatic peat covers a till with high shale content. This upper shale surface by its very nature a highly lubricated surface. When the overlying peat becomes supersaturated and heavy, as it did over winter, there were a number of slides on this mountain. Some of the minor roads remained closed for weeks. Once the overlying bog begins to move it sweeps all in its path downhill, including trees.

There is a statutory obligation to have an EIA prepared where the effect of the proposed works have significant effects on the environment by virtue of its nature, size and location- in accordance with Directive 85/ 337 and as amended by Directive 97/11.
Accordingly I can only recommend an EIA is prepared before any grant of licence is considered.

For Consideration :

The scope of the assessment will have to include the combined affects of the combined operations. Where is the logic of replanting an area that is felled in the first instance to mitigate turbulence. Besides the area would not be considered for afforestation at this point in time for silvicultural and environmental reasons. (There was ample opportunity in purchasing lowland farms offered for sale last year in the Drumkeeran vicinity.)

Senan Kelly.

S Kelly.
9/3/09

9th March 2009.

Mr Liam Quinn,
Coillte Teoranta,
Newtownmountkennedy,
Co Wicklow.

Re: GFL SO100009/LM060009/LM080009-Garvagh Glebe

Dear Liam,

I refer to the above GFL applications covering the proposed clearfelling of approximately 153 ha's to facilitate windfarm development.

Because of the size of the development the following issues need to be addressed in order to enable the Forest Service carry out a detailed examination of all the issues involved.

The Project

- Reasons and rationale for the proposed felling.
- Alternatives explored
- Plans in terms of rotation length for the succeeding rotation.
- Total proposed felling associated with the development i.e. area, species, yield class, age at the proposed felling time, normal rotation length. This data should be supplemented by provision of aerial photography, Forest Inventory and TRC data including fell year maps for the areas concerned. Maps of all known archaeological monuments together with maps of SAC's/SPA's, NHA's pNHA's in the locality should also be furnished.

- Evidence of stakeholder consultation and consultations with Regional Fisheries Board and County Council on the project.
- Planned phasing of such felling.
- Replanting plan for the areas detailing year of replanting and spp. proposed and fertiliser application.
- Soil type(s).
- The catchments(by the lowest order stream) indicating the % catchment(upstream of the lowest activity point) by activity type(clearfelling and replanting)
- Landscape desigination per the County Development Plan.
- Water body characterisation per the Water Framework Directive. As part of this please submit details of water sampling results carried out to date.

Cumulative Effect

Data (incl no of ha's, species, planting year, yield class, soil type and water catchment indicating the % of water catchment by activity) and maps detailing areas(incl felling areas associated with wind farm) where:

- Tree felling is proposed in the next five years.
- Felled areas in the past 4 years in the locality.

- Areas replanted in the past 4 years.
- All areas in receipt of fertiliser in the past 4 years.
- All proposed road developments and standards.
- All drainage works associated with all activities on the site.

Potential Impacts/mitigation:

- Potential impacts should take account of the cumulation of areas felled in the previous four years from current date and proposed areas to be felled in the next 5 years from current date.
- Justification/rational for the pre-maturity of the felling, where applicable, in comparison with the accepted rotation lengths for the species and yield classes.
- Provision of a Forest Landscape Design Plan for the entire project area by a suitable qualified Landscape Architect with experience in forestry. This plan should take account of the impact of any felling / replanting proposals already licenced in the area.
- Potential impacts and mitigation and monitoring measures to be adopted in respect of the following:

    - Soil Stability
    - Water Quality(particularly with regard to sedimentation and eutrophication)
    - Landscape
    - Ecology/habitats
    - Monuments

- The Economic impact due to the reduced forest rotation (where applicable) and on planned future rotations.
- Screening to address potential impacts on SAC's/SPA's per the EU Habitats Directive/Regulations.

Yours sincerely,

Sean Crowe.
Felling Section,
Forest Service

C4

Dykes 2022 - Peat Landslide Paper

Published scientific evidence on recent Irish peat landslides, including Boleybrack/Shass Mountain in County Leitrim and Meenbog Wind Farm. It supports the objection that forestry, rainfall, access roads, upland blanket peat and watercourse pollution are relevant risk factors.

Source file: Dykes2022_Article_LandslideInvestigationsDuringP(1).pdf

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Alan P. Dykes

Landslide investigations during pandemic restrictions: initial assessment of recent peat landslides in Ireland

Abstract Landslides involving peat are relatively common in Ireland, upland areas of Great Britain and subantarctic islands. Bogflows and bog slides are less common types of peat failure and almost unknown outside Ireland. Unusually, three of these occurred in 2020 including one bogflow at a windfarm that gained much adverse media attention, and a small but damaging peat slide was also reported. The aim of this paper is to determine the extent to which the new bog slide and bogflows are consistent with previous examples in terms of their contexts, characteristics and possible causes, particularly relating to commercial forestry operations. Aerial video footage of all three landslides obtained by local people using drones, and ground-based footage of one of them in progress, allowed a detailed examination of their characteristics and contexts to be made despite the global travel and activity restrictions caused by the coronavirus pandemic. The windfarm bogflow appears to have resulted from removal of toe support by an earlier peat flow that was itself probably caused by construction of an access road; the other two landslides were most likely triggered by rainfall. All three are consistent with previous examples of their respective types in their general characteristics and appear to be associated with well-known causal factors including hydrological, topographic and/or forestry influences. Forestry operations probably contributed to the occurrence of two of the landslides and restricted the expansion of two of them.

Keywords Upland blanket peat · Bogflow · Bog slide · Peat landslide · Ireland

Introduction

Landslides involving peat have become well known as geomorphological and geotechnical phenomena since a series of damaging events in 2003 in western Ireland and northern Scotland (Lindsay and Bragg 2005; Long and Jennings 2006; Dykes and Warburton 2007a, 2008). Previously sporadic reports of specific individual events started to be collated and re-assessed around that time to start to identify common causal factors and, thus, potential risk factors (Warburton et al. 2004; Dykes and Kirk 2006; Dykes 2008a; Boylan et al. 2008). As part of this rapid expansion of new knowledge of the topic, Dykes and Warburton (2007b) presented a formal classification scheme intended to reduce further confusion arising from inconsistent use of descriptive names in the literature. Some types of failure (bog slides, peat slides, peaty-debris slides and at least some peat flows) involve shearing and sliding on a discrete failure surface but the precise mechanism of failure in bog bursts and bogflows is as yet unknown. The distinction between bogflows (with bog bursts) and bog slides is therefore made according to field evidence of failure morphology and the presence or absence of an observable failure surface.

Although relatively common in many parts of the British Isles and on several subantarctic islands with climates similarly favourable for the formation of blanket peat (Lindsay et al. 1988), few failures of peat deposits are known from elsewhere in the world (Dykes and Selkirk-Bell 2010). Many peat failures occur in more remote locations where they may pose relatively little hazard to local communities and associated infrastructures, but they are often locally environmentally damaging because the more highly humified (decomposed) peat is a strong pollutant to aquatic life where runout sediment enters streams and lakes (e.g. McCahon et al. 1987; Wilson et al. 1996). In some past cases, the runout affected watercourses, agricultural land and even treated water supplies to whole towns many kilometres downstream (Dykes and Jennings 2011). Furthermore, they result in the fragmentation, exposure, oxidation and associated release of carbon dioxide from sometimes very large quantities of what is one of the Earth's most effective carbon-storing materials.

Following several years with only a handful of significant peat failures, four events thought to comprise five landslides occurred in 2020 (Fig. 1) and were initially reported by Petley (2020 and subsequent posts):

1. In the evening of Sunday 28 June 2020, a large bogflow occurred on Boleybrack Mountain near Lough Allen, Co. Leitrim, Republic of Ireland. This landslide (Ref. 'BBM-20' in this paper) is notable for being the first of its type to occur for several years, and the largest of its type since the Glendun bogflow of 1963 (Colhoun et al. 1965).
2. On 25 August, a small landslide of around 2000–3000 m^3, provisionally identified as a peat slide, was triggered by heavy rainfall from Storm Francis on the northern spur of Slieveanorra, Co. Antrim, Northern Ireland, at 55°05′28″N, 6°13′59″W (Ordnance Survey Ireland grid coordinate D 129 286). It blocked the same road as on previous occasions (e.g. Tomlinson and Gardiner 1982) but in this case the disruption was short-lived.
3. On 13 November, a bogflow occurred at Meenbog in Co Donegal, Republic of Ireland (Ref. 'MBW-20b' in this paper). This landslide is particularly interesting because of its relationship to construction of a new windfarm and a preceding failure ('MBW-20a').
4. Sometime shortly before the Meenbog event, a significant landslide—provisionally classified as a bog slide—occurred on the forested northern slope of Knockanefune Mountain in Co

Fig. 1 Locations of the five peat landslide events of 2020 in Ireland (two at 'MBW-20'). Source: Google Earth (Image Landsat/Copernicus; Data SIO/NOAA/U.S. Navy/NGA/GEBCO; ©2021 Google)

Kerry, Republic of Ireland (Ref. 'KFM-20'). Here, the forestry context demands specific consideration.

This Technical Note examines the degree to which the recent bogflows (BBM-20, MBW-20b) and bog slide (KFM-20) have characteristics and causal factors consistent with previous such landslides for which details are known, and assesses the possible role of commercial forestry as a contributory causal factor in each case. The peat slide (No. 2, above) is not included in this study because peat slides and peaty-debris slides are more common and generally much smaller. The purpose of the study is to enhance knowledge and awareness of risk factors for which future provisions may need to be made by landowners and relevant authorities, given the scale of any potential direct environmental and indeed economic impacts of such events.

Materials and methods

All of the recent landslides reported in this paper occurred during the global coronavirus pandemic when travel and other restrictions prevailed. This work was made possible by the existence and availability of aerial video footage of the three large landslides obtained by local people using drones, but also some unique ground-based footage of one of them in progress. Because of the inadvisability and effective impossibility of travelling to undertake fieldwork, all details and characteristics of these failures have been derived from three sources: (a) Google Earth (hereafter referred to as 'GE'); (b) Ordnance Survey of Ireland ('OSI') 1:50,000 scale 'Discovery Series' topographic maps; and (c) the third-party video footage made available on-line on YouTube or Twitter (for which permission to use here was readily granted). Characteristics of all reported bogflows ($n = 17$) and bog slides ($n = 20$) since 1895 were obtained from published accounts, in many cases supplemented by more recent field examinations (e.g. Dykes 2009). These records allow some assumptions to be made about the new landslides, including displacement of the full thickness of peat across large parts of the source areas following failure somewhere within typically the lowest 0.5 m. Source area gradients of the 2020 landslides were derived from the 1:50,000 maps. As such, this study demonstrates the present feasibility of one possible 'future' mode of landslide research—i.e. undertaken entirely from the office—expounded by Brunsden (1993).

Details of the recent landslides

BBM-20: Boleybrack Mountain bogflow

Site characteristics and trigger conditions

The source area of this bogflow is roughly centred on 54°12′30″N, 8°04′40″W (OSI grid coordinate G 948 285), 6 km northeast of Drumkeeran. The bogflow initially became known as the Dawn of Hope landslide (e.g. Petley 2020) but in this paper it is identified

as 'BBM-20' (i.e. 'Boleybrack Mountain 2020'). A video showing the entire extent of affected land can be viewed on YouTube (https://www.youtube.com/watch?v=ttJsyGSBPcc – Flynn 2020). The source area is located on the south-facing side of a very broad and gently sloping spur at the southeastern end of Boleybrack Mountain (Fig. 2a), at around 270 m above sea level. The underlying geology is the Gowlaun Shale Formation of Carboniferous (Namurian) age, comprising silty sideritic shale (GSI 2021). Much of Boleybrack Mountain is a designated Special Area of Conservation with active blanket bog being one of the five habitats that led to this status (NPWS 2013). Commercial forestry has encroached upon the southern tip of the Boleybrack upland in recent years. The 2004 edition of the topographic map shows no forest within 500 m of the failure site (OSI 2004), but at the time of the failure there was young plantation forest immediately north, west and south of the bogflow's source area (Flynn 2020). The trigger for the failure was most likely localised very heavy—though perhaps not 'extreme'—rainfall on 28 June 2020, with 44.4 mm recorded at Finner Camp, Co. Donegal (33 km to the NNW) (Met Éireann 2020a) and Newport, Co. Mayo, experiencing its wettest June day in its 60-year record on the same day with 53.4 mm (Met Éireann 2020b). This followed an unusually warm and dry second quarter of the year.

Characteristics of the landslide

Dykes and Warburton (2007b) defined a 'bogflow' as 'Failure of a *blanket bog* (i.e. bog peat) involving the break-out and evacuation of semi-liquid highly humified basal peat from a clearly defined source area' (p.79, their italics). The morphology of a bogflow is very distinctive: BBM-20 is an excellent example of the type (Fig. 2). The defining characteristic is that most of the source area perimeter comprises large (e.g. up to 15–20 m long, up to 3–5 m wide and typically > 1 m thick) intact blocks or 'rafts' of peat that have been displaced downwards into the source area by vertical subsidence, back-tilted rotation and/or occasionally forward toppling, often with a crescentic pattern (Figs. 2b, c). In this case, the toe of the source area appears to coincide with the head of the tributary stream course adjacent to a narrow strip of forest (Fig. 2d). Upstream of this point, the 1:50,000 map (OSI Sheet 26) shows a steepest average gradient (over ~ 350 m distance) of no more than 3.3°, but the gradient into the tributary valley varies between around 3 and 6° suggesting a convex change of slope that is significant at such low gradients.

The thickness of the peat is not known but measurements at other failure sites (e.g. Dykes and Jennings 2011; Dykes 2019) suggest that the base of the peat is likely to be up to around 3 m deep, and possibly more, across much of the affected area at BBM-20. Based on the video of Flynn (2020) and the (pre-failure) GE view of the site, the source area is around 450 m long and up to 250 m wide, with a minimum volume of 200,000 m^3 if the peat is slightly less than 3 m deep throughout. The properties of the catotelm (i.e. lower, permanently saturated anaerobic layer below 0.5–1.0 m depth) of Irish blanket peat are summarised in Table 1. Based on these, this bogflow released many thousands of tonnes of solids,

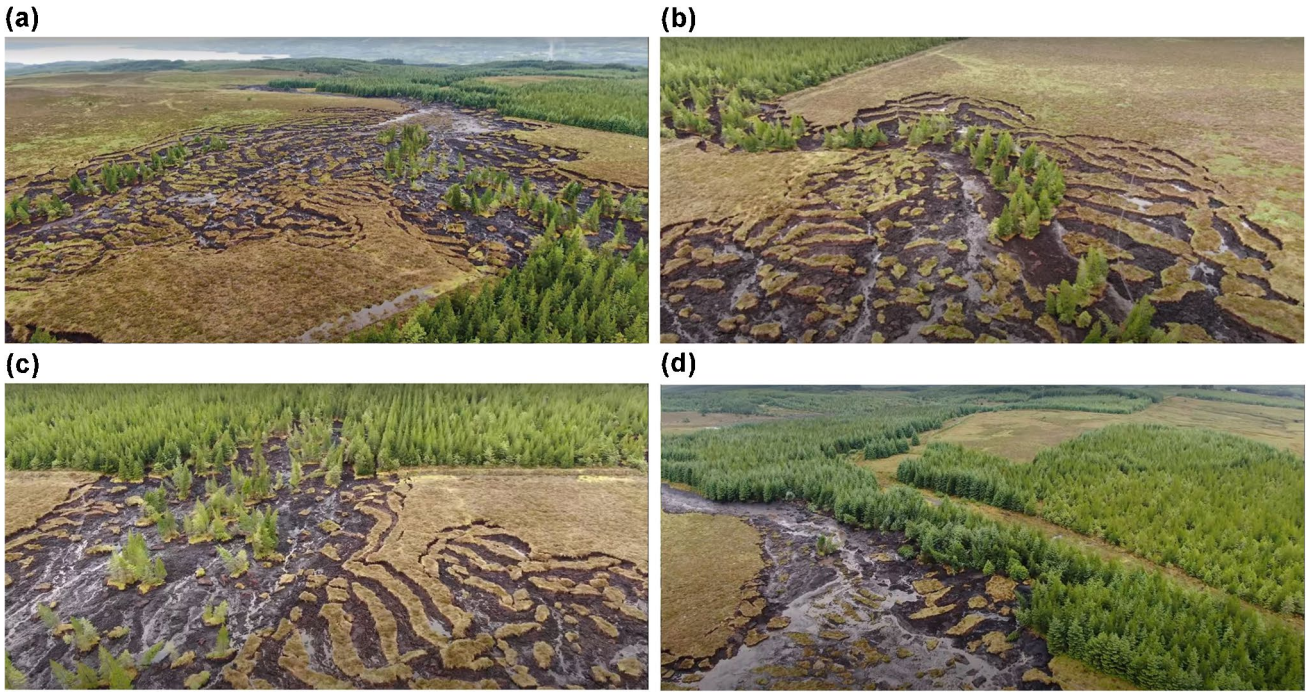

Fig. 2 **a** The source area of the Boleybrack Mountain bogflow, looking approximately towards SSW. The 'main' head is at the extreme right within the forest. Source: 2 m 39 s in Flynn (2020). **b** Train of trees heading south from the secondary head of the bogflow, with adjacent peat subsiding inwards towards an apparent subsurface drainage line. Source: 1 m 03 s in Flynn (2020). **c** The main head of the bogflow with much greater evacuation of peat and associated transport of rafts of upper peat. In **b** and **c,** note how the transported trees remain upright as the peat rafts effectively float on top of the flow of semi-liquid lower peat. Source: 1 m 20 s in Flynn (2020). **d** The toe of the source area looking downstream. Note the left margin has been eroded, with some rafts pushed up against it, whilst on the right some trees have been pushed over by the moving mass of peat. Source: 3 m 05 s in Flynn (2020)

mostly comprising colloidal fragments of highly humified (decomposed) amorphous remains of plant matter, which were carried by the runout flow and contaminated watercourses and farmland up to 7 km downstream. However, much of the displaced peat, including many large rafts, remained within the source area.

There are several features that indicate what probably happened here, partly in line with Petley's (2020) preliminary observations:

1. Upslope of the convex break of slope (near the bottom of Fig. 2d), all parts of the source area margins show tension cracking of the upper peat as it was dragged inwards and downslope by the lower peat, whereas downslope of this point both sides have been impacted by moving peat (the flow and intact floating rafts) from upslope. This suggests that the failure originated at, or upslope of, the convex break, with everything further upslope developing by retrogression. This is a common scenario as observed at 8 out of 15 previous bogflows, where very deep and very soft and wet peat on low-angle topographic benches on the substrate exerts stress onto slightly thinner, drier and firmer peat on the adjacent steeper slope. The other 7 of the 15 occurred at the edges of escarpments where the same configuration is more pronounced.
2. There is a main source area which extends directly from the toe to the forest plantation, within which almost all of the surface peat has been carried away by the flow. The 'main' head extends back into the forest for a short distance. Figure 2c shows the trees—and therefore the pre-forestry drainage plough lines—to lead directly towards the location of the bogflow. This would have preferentially directed the rainwater into the deep peat on the slope outside the forest, especially if the peat contained well-developed pipe networks as observed elsewhere (Holden and Burt 2003; Warburton et al. 2004; Dykes et al. 2008), contributing to the lateral loading throughout the lower peat against the break of slope at the toe. Conversely, further headward retrogression was probably prevented by root reinforcement of the acrotelm peat by the trees.
3. There is an extensive area of upslope retrogression to the east of the main source area where the lower peat has failed but was mostly unable to fully mobilise and flow down the slope. However, a train of trees leading away from the 'secondary' head of the bogflow (Fig. 2b) shows significant displacement of rafts of upper peat floated on a narrow channel of flowing lower peat. This suggests that there may be a topographic drainage channel along the mineral substrate surface, within which the peat may always have been extremely wet and possibly already semi-liquid in consistency. The large rainwater inputs from the forestry drains can be expected to have exerted very high and possibly artesian water pressures around this channel (as observed elsewhere: Dykes and Warburton 2008), promoting the very localised flow and its own lateral retrogressive margins.

Table 1 Values of peat properties, measured in the laboratory, of undisturbed samples obtained from near the base of the (lower catotelm) peat in the source area margin at each landslide

Property of peat	Units	Range	No. of bogflows	No. of bog slides	Reference(s) [a]
Water content (field-wet)	% (mass fraction)	450–990	5	3	A, B, C, D
Water content (saturated)	% (mass fraction)	450–1160	5	3	A, B, C, D
Liquid limit	% (mass fraction)	~700–800	2	1	A
Volumetric water content (saturated)	Ratio	0.88–0.97	3	2	A, B
Bulk density (saturated)	kg m^{-3}	1010–1120	5	3	A, B, C, D
Bulk density (dry)	kg m^{-3}	100–200	5	3	A, B, C, D
Ash content	%	1.0–5.5	5	3	A, B, C, D
Humification	von Post scale	8–10	3	2	A, B
Saturated hydraulic conductivity (vertical)	m s^{-1}	$<10^{-11}$–10^{-5}	2	3	A, C
Saturated hydraulic conductivity (horizontal)	m s^{-1}	10^{-11}–10^{-6}	3	2	B, C, D
Undrained shear strength (triaxial)	kPa	1.6–2.4	3	0	D
Undrained shear strength (direct simple shear)	kPa	5.0–6.0	0	0	E [b]
Tensile strength	kPa	< 3 (< 4)	3	0	D, E [b]

[a] A = Yang and Dykes (2006), B = Dykes (2008c), C = Dykes et al. (2008), D = Foteu Madio and Dykes (2018), E = Dykes (2019)

[b] Data from a peat slide in Co. Antrim

MBW-20b: Meenbog Windfarm bogflow

Site characteristics and trigger conditions

The source area of this bogflow (Fig. 5) is at 54°43′06″N, 7°52′30″W (Ordnance Survey Ireland grid coordinate H 081 856), approximately 8 km southwest of Ballybofey and 5 km east of the Barnesmore Gap, Co. Donegal, 700 m west of the international border with the UK (Northern Ireland). Two videos of this site can be viewed on YouTube: one is an aerial drone footage from the distal runout to the source area (https://www.youtube.com/watch?v=xbQe55YnW5g: Derg Media 2020), while the second (https://www.youtube.com/watch?v=rf6S9Uz2Zrw: Donegal Daily TV 2020) shows the flow passing the truncated road at the exit from the source area, which must be only a short time after the initial failure. The source area is located at around 265 m altitude on a small spur of Carrickaduff Hill that descends roughly northeastwards towards Meenbog. The underlying geology comprises Precambrian metamorphosed sandstones (GSI 2021).

The location of the failure site is within a large area of commercial forestry, but the main source area developed within a rectangular parcel of unplanted ground roughly 380 m N-S × 280 m E-W. It is not known why this plot was never planted. The regular geometry suggests a land ownership issue but it may be that the peat was known to be too soft and weak and/or too deep to support any forestry operations. The Meenbog Windfarm project led to felling of trees within many similar parcels of land along with construction or upgrading of a dense network of access roads/tracks, including 'floating roads', to facilitate construction of the turbines. AGEC (2017, p. 12) noted that the pre-existing floating roads varied in type but commonly comprised 'tree brash/trunks laid directly onto the peat surface and/or … geogrid overlain by up to 500 mm of coarse granular fill'. Note that there are no turbines within 300 m of the landslide source area, nor within 200 m of the runout path, and therefore, that turbine base construction works are not relevant to the peat failure.

Site investigations by AGEC (2017, p. 12) found peat depths along the proposed new access roads to be 'typically less than 3.0 m with localised depths of up to 4.5 m recorded'. The very low gradient of the unplanted plot and its position at the foot of a much steeper slope could be expected to give rise to a very deep and very wet accumulation of peat. Peat more than 3.0 m deep was recorded around a road within 60 m NW of the unplanted plot, and in the area of the eventual failure, a road identified as a 'new access track', along the eastern edge of the same plot, crosses peat 2.5–3.0 m deep (AGEC 2017). The general susceptibility of the blanket peat to failure, as throughout Ireland, is highlighted by the occurrence of the large Barnesmore bogflow in November 1963 (Colhoun et al. 1965) on the same tract of upland just 3.5 km further northwest.

The rainfall recorded at Finner Camp, the nearest meteorological station to MBW-20, shows no evidence for a rainfall trigger any time between 1 and 13 (date of bogflow) November. However, the lower end of the source area, where the displaced peat effectively channelised into a runout track, is located where the 'new access road' crosses the eastern boundary of the unplanted plot. The drone video (Derg Media 2020) clearly shows that tree brash/trunks had been placed along the first 60–70 m along the plot boundary and that the gravel fill was being advanced towards the corner of the plot (bottom left corner of Fig. 3a). Therefore it appears likely that the failure is associated with construction of this new access road, as discussed below.

Characteristics of the landslide

The morphology of the source area of MBW-20b—upslope of the new access road—is another excellent example of a bogflow with the same general characteristics as described for BBM-20 (Fig. 3). The inward tearing of rafts of peat from the lateral margins, including from the adjacent forested plot (Fig. 3b), indicated that the failure began downslope of these zones—i.e. at or near the new access road. Note the limited expansion into the forested area compared with the open plot. The 1:50,000 map (OSI Sheet 11) suggests a gradient of little more than 1° across the open plot and around 3.8° downslope from the road. The peat depth throughout the source area can reasonably be assumed to be at the upper end of the measured 2.5–3.5 m range (see above). Based on the video of Derg Media (2020), the source area upslope from the road is around 240 m long and up to 120 m wide. A mean peat depth of slightly less than 3 m gives the failure a volume of 65,000 m^3. The catotelm peat can be reasonably expected to have properties consistent with Table 2. Therefore, this bogflow also released several thousand tonnes of polluting solids in addition to runout from the initial peat flow.

There are several pieces of visible evidence in the Donegal Daily (2020) video that strongly suggest the bogflow to have been indirectly caused by the access road construction, by means of a preceding failure. Firstly (0:26–0:34 in the video: Fig. 4a), the furthest part of the advancing gravel fill for the new access road can be seen to have subsided into an area of collapsed peat, with some small patches of gravel visible several metres downslope from the road at 0:34. Secondly, the peat ahead of, and downslope from, this collapsed end of the road is entirely disrupted, broken into chaotic blocks. This is typical of 'peat flows' (Dykes and Warburton 2007b) triggered by head-loading, as observed at other known examples (e.g. Slieve Bearnagh – Dykes 2008b; Ballincollig Hill – Dykes and Jennings 2011). Thirdly, this zone of chaotic blocks is stationary, i.e. an initial head-loaded failure has ceased, but trees from the edge of the bogflow source area, less than 100 m further upslope, are just starting to float past this point standing on intact rafts of peat. This is a strong indication that an initial peat flow at the convex break of slope (Fig. 4b) removed lateral support for, and thus allowed the release of, very wet and weak lower catotelm peat from the unplanted plot; i.e. the bogflow constitutes a separate second failure.

It is not clear whether the initial failure ('peat flow MBW-20a') involved the full width of the gap in the new access road (around 60 m) or, as the two videos seem to suggest, just the ~ 30 m nearest the collapsed gravel section (Fig. 4b). It is also not clear how far downslope the initial failure of peat extended, although there appears to be significant loss of peat from an erosion track around 40 m wide extending to the drainage line 290 m further downslope. If the peat here is 2.5 m deep, then—including the peat flow head near the road—at least 30,000 m^3 of peat may have been displaced within this zone, probably sending at least several hundred tonnes of polluting solids downstream.

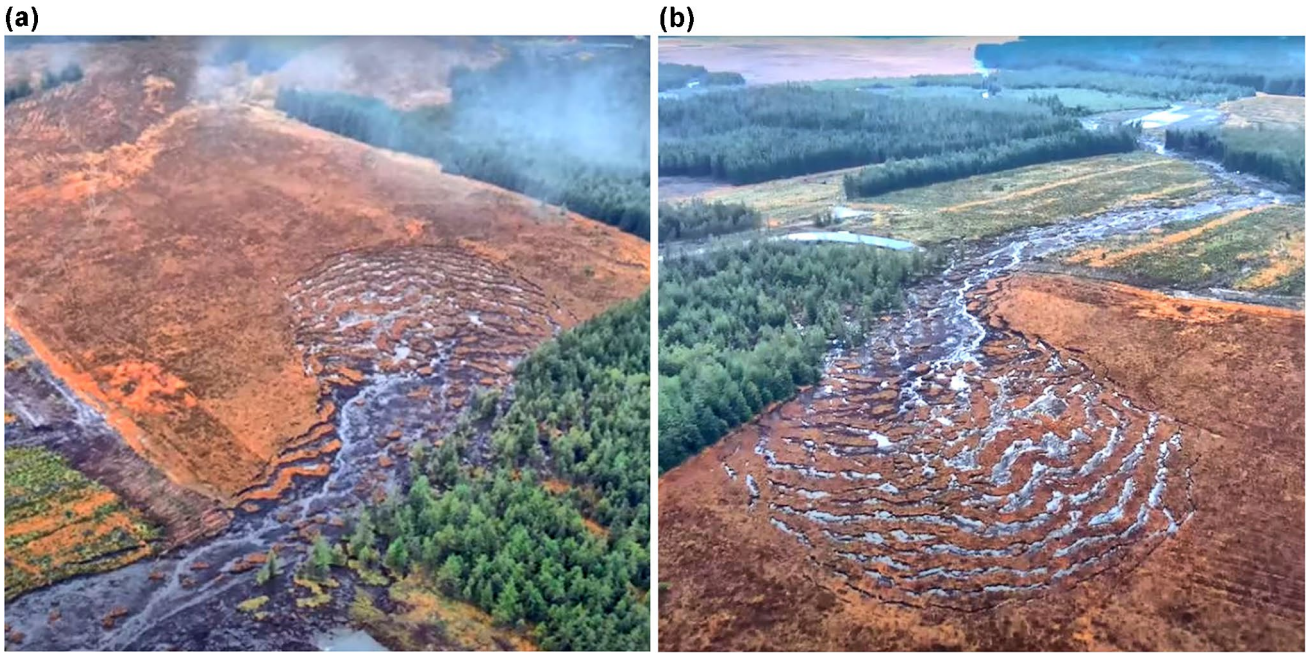

Fig. 3 The source area of the Meenbog Windfarm bogflow. a View towards the SW showing the steeply rising slope at the far end of the unplanted plot (top left). Source: 0 m 47 s in Derg Media (2020). b View towards the NE showing the site of the initial peat flow (beyond the new access road) and the runout extending into a natural drainage line. Source: 1 m 10 s in Derg Media (2020)

Table 2 Frequency of known incidence of common features of failure sites

Failure site characteristics [a]	Bogflows (out of 17) [b]	Bog slides (out of 20) [b]
Edge of escarpment	7	*None*
Concave break of slope	*None*	6[c]
Convex slope/convex break of slope	8 plus **BBM-20, MBW-20b**	6 plus **KFM-20** [d]
Stream channel at toe of failed slope	**BBM-20** – *but not like the bog slides*	4
One or more drainage or boundary ditches	8	5
Forestry plough lines and/or ditches	2 plus **BBM-20** (*possibly* **MBW-20b**)	2 plus **KFM-20**

[a]Two failures were associated with peat cutting (both manual and by tractor-mounted Difco ('sausage') machine, and two other failures may or may not have been affected by manual peat cutting

[b]Totals include the three 2020 landslides

[c]All bog slides with concave breaks of slope have length:width ratios ≤ 2.4 (except BCF-88) and volumes ≤ 27,000 m^3

[d]All bog slides on convex slopes have length:width ratios ≥ 6.4 and volumes ≥ 45,000 m^3 (+ SBO-73 with 19,000 m^3)

KFM-20: Knockanefune Mountain

Site characteristics and trigger conditions

The source area of this bog slide is at 52°13′30″N, 9°18′12″W (Ordnance Survey Ireland grid coordinate R 110 090), 11 km east of Castleisland, Co. Kerry. It is located on the north-facing slope of the roughly east–west mountain ridge immediately southwest from Knockanefune Mountain, 2 km southeast from Mount Eagle, at around 430 m above sea level. Two videos of this site can be viewed on Twitter: one is an aerial drone footage of the mid-lower source area (https://mobile.twitter.com/savekerry/status/1328059773825257475?lang=en-GB: Save Kerry 2020a), while the second (https://twitter.com/savekerry/status/1328342795795492866?lang=en: Save Kerry 2020b) shows some views within the source area from the ground. The underlying geology is the Feale Sandstone Formation of Carboniferous (Namurian) age, comprising alternating sandstone with shale/siltstone (GSI 2021). The location is within a private forest plantation, which is shown on the 2006 edition of the topographic map (OSI 2006). The new bog slide formed alongside a near-identical failure dating from sometime between 27 March 2012 and 29 March 2019 (dates of GE images). Both landslides are visible on the latest (22 April 2021) GE image of this location (Fig. 5). The exact date of this bog slide is not known but it was shortly

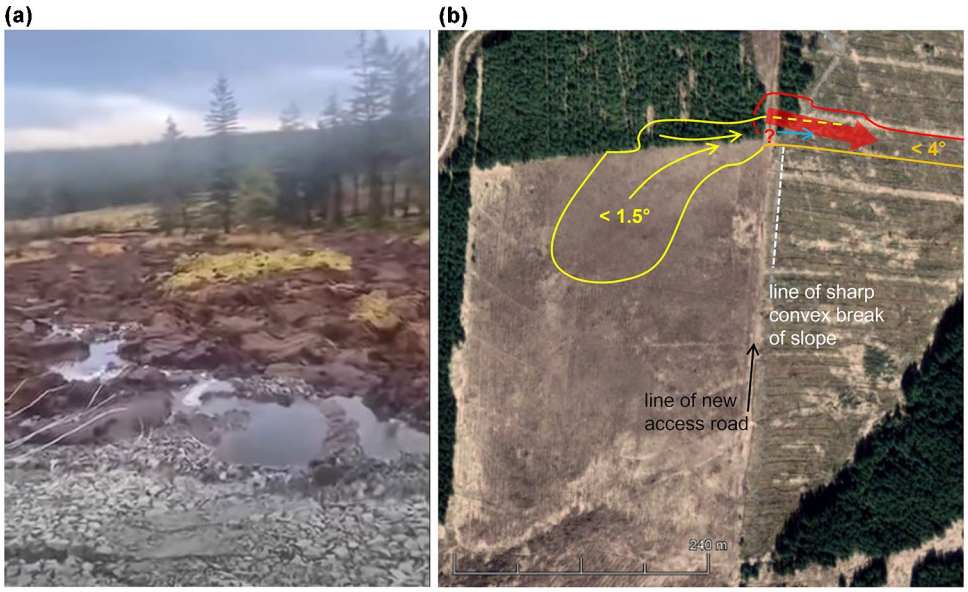

Fig. 4 **a** The head of the initial peat flow with the collapsed end of the gravel road in the foreground and trees floating past from right to left around 40–50 m ahead. Source: 0 m 26 s in Donegal Daily (2020). **b** Outline plan of the site: red = initial peat flow, yellow = bogflow, orange = southern margin of both failures, light blue arrow = moving trees in the video of the bogflow. Note the steep slope rising from the unplanted plot at the bottom of the image

Fig. 5 The 'Mount Eagle' bog slides on Knockanefune Mountain. KFM-20 is the lower slide with a head extending into the open blanket bog above the forest (lower left). The straight, narrow track around 1/3 of the way down the slope coincides with the main convex break of slope, where distinct failure surfaces are visible in both landslides. Source: Google Earth (Image © 2021 CNES/ Airbus; ©2021 Google)

before the Meenbog event (Save Kerry 2020a, b). Rainfall records from the nearest Met Eireann stations show a significant (but not exceptional) widespread rainfall event on 11 November with very high antecedent rainfall, which seems to be the most likely trigger.

Characteristics of the landslide

Dykes and Warburton (2007b) defined a 'bog slide' as 'Failure of a *blanket bog* (i.e. bog peat) involving sliding of intact peat on a shearing surface within the basal peat' (p. 81, their italics). The morphology of a bog slide can be variable between that of a bogflow and a peat slide, but in general the lateral marginstend to be more clearly defined (fewer subsided strips or 'rafts' of intact peat). The forestry context makes it more difficult to see the features clearly, but some extensive areas of basal shear surface can be seen in Fig. 6a and the geometry is essentially longand linear although widening slightly in the downslope direction. The upper 250 m length, above the 400 m contour, is almost planar at around 5.8°; then, the slope steepens to around 10.8° (1:50,000 map, OSI sheet 72).

Figure 5 appears to show that KFM-20 developed throughout most of its length at the same time, given that there are effectively no strips or rafts of peat formed by tensile stresses at the margins right up to the head margin. The high density of peat rafts stranded within the upper 150 m can be attributed to basal sliding friction on the lower gradient retarding their movement. Figure 5 also shows that the upper part of the older landslide may have formed by retrogressive expansion above the break of slope, indicated by the much wider head zone above a narrow 'neck'. This would suggest that failure initiated somewhere around the break of slope, probably therefore in both cases given the similarity of the context and, most likely, the peat and condition of the forest.

The depth of peat is unknown, but the blocks and rafts of peat visible in the videos (e.g. Figure 6b) appear consistent with

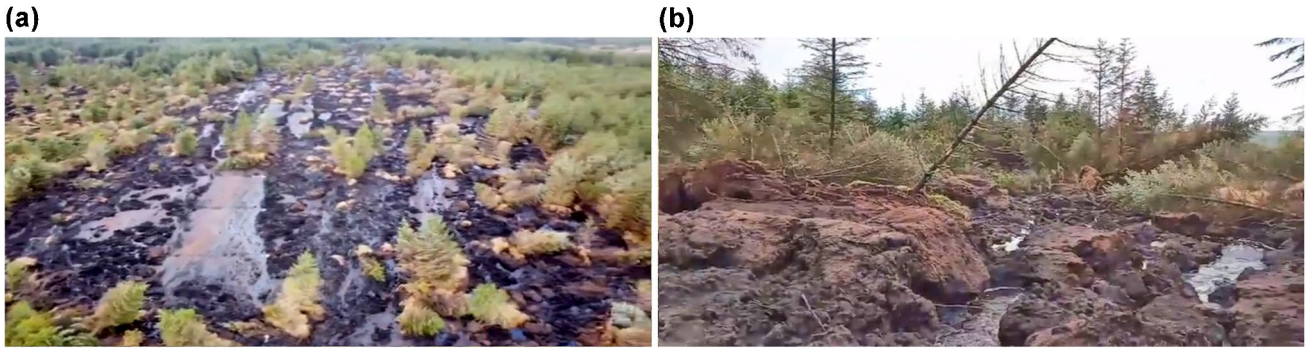

Fig. 6 **a** View down the latest bog slide KFM-20 from just above the convex break of slope. The older slide can be seen at the extreme upper left. Source: 0 m 34 s in Save Kerry (2020a). **b** Displaced rafts and blocks of peat within the lower part of the source area. Source: 0 m 06 s in Save Kerry (2020b)

peat up to 2 m deep although probably less on the steeper lower part of the slope. The total length of the source area is around 480 m and the width increases from ~ 30 m at the head to ~ 60 m throughout the lower half. If the depth of peat is assumed to be 2 m at the head and 1.5 m on the lower slope, then the total failure volume is around 40,000 m^3. Again, at least several hundred tonnes of solids are likely to have reached the natural watercourses with much of this eventually polluting River Clydagh.

Discussion

Comparisons with previous bogflows and bog slides

Despite the small sample size (even for Ireland), some distinct patterns can be identified that provide context for the events of 2020 reported above:

1. *Occurrence*—The frequency of occurrence of these large blanket bog failures appears to have been increasing throughout the last 130 years—although the average remains just below three per decade. This should perhaps be viewed in the context of apparently increasing annual rainfall for Ireland (Fig. 7a), although there is no significant statistical relationship. For the failures with known dates of occurrence, a higher frequency associated with higher autumn rainfall is clearly indicated in Fig. 7b but very heavy summer rainfall following prolonged hot and dry periods—predicted to become a more common scenario—is a recognised risk factor. The overall pattern has shifted 2–3 months earlier compared with a similar analysis by Alexander et al. (1985). The BBM-20 bogflow is the first example known to have occurred in June but changing rainfall patterns may be expected to give rise to more in future years.

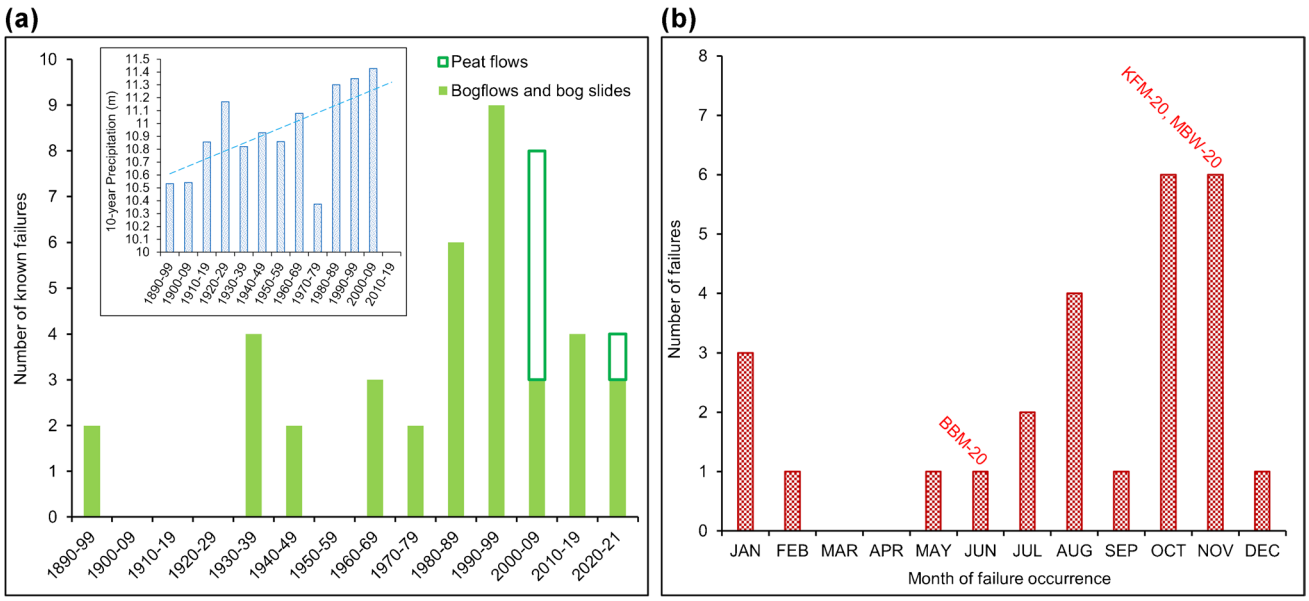

Fig. 7 Occurrence of reported bogflows and bog slides in Ireland. **a** Frequency by decade. Peat flows are also shown to highlight the period of accelerated onshore windfarm developments leading to greater awareness and regulation of the risks. Inset: Decadal rainfall totals for the Republic of Ireland (Met Eireann 2020b). The data for 2010–2019 are not yet available. **b** Seasonal occurrence of bogflows and bog slides

2. *Site characteristics*—Several commonly occurring features of bogflow and bog slide failure locations have been noted in previous published accounts of specific examples, and reviewed for all types of peat failures by Dykes and Kirk (2006) and Dykes (2008a). These are summarised in Table 2. The 'drainage or boundary ditches' include all types of hydrological and/or structural influences of cut or excavated features, but ditches and ploughing for forestry planting are considered separately. The different topographic contexts associated with the two failure types are worthy of note and the three recent landslides can be seen to have features common to their respective types.
3. *Topography*—The relationship between gradient of slope and depth of peat is thought to be a key factor in understanding blanket bog failures. Figure 8a shows peat depths corresponding with dominant gradients at all the landslides examined for this study. Two things are readily apparent. Firstly, bogflows tend to be associated with slightly deeper peat on lower gradient slopes than bog slides, and that the two groups of failures appear to be separated by a threshold slope of 4.75°. Secondly, with one exception (the Moanbane bog slide: Mitchell 1938), a peat depth-gradient curve obtained from 32 landslides on Dooncarton Mountain, Co. Mayo (Dykes and Warburton 2007a) appears to define an upper limit for these types of failures. Although MBW-20b has an unusually low gradient, the three recent failures are otherwise consistent with the previous recorded examples.
4. *Geometry*—Several simple geometrical parameters were examined to determine whether any other relationships existed that could help to explain the different characteristics of bog slides and bogflows. In both types of landsides, deeper peat generally allows greater volumes of peat to fail but the relationships differ. Figure 8b shows that bog slides tend to be smaller and that bogflows can develop to be extremely large, with the larger bog slides (> 200 m long) being 4½ to 8½ times longer than their maximum widths while most bogflows show much greater lateral expansion relative to their lengths. No other relationships could be identified. Only the gradient showed a clear threshold dividing the two groups.
5. *Peat characteristics*—Ash content, mass fraction water content and field-wet or saturated bulk density are key indicators of the in situ characteristics of the peat (Hobbs 1986; O'Kelly 2015). Even the qualitative scale of peat humification determined by the von Post 'squeeze test' provides a degree of information that engineers find useful for characterising peat (Hobbs 1986; Carlsten 1993). Quantitative data from blanket bogs are now providing a basis for investigating the geotechnical properties and behaviour of peat in new and more detailed ways to improve our quantitative assessment of in situ peat strength (e.g. O'Kelly 2017) and understanding of mechanisms of failure. Table 1 presents data obtained from lower catotelm peat, i.e. the assumed failure zone, at five bogflows and three bog slides plus a recent 'peat slide' in Co. Antrim (Dykes 2019). It shows that the characteristics of lower catotelm peat that may relate to in situ strength seem to be broadly consistent throughout the island of Ireland (Dykes 2019), and are probably representative of the peat at all of the three recent landslides.

Implications for peat failure hazard assessment

The three recent peat landslides seem to reinforce known common risk factors for the respective types of failure, in particular the possibility of very large bogflows from very low gradient (< 5°) convex slopes and smaller, probably less mobile bog slides from steeper slopes—although both types can deliver hundreds or thousands of tonnes of polluting peat particles to watercourses and so cause potentially significant economic as well as ecological damage for many kilometres downstream. Climate change predictions of

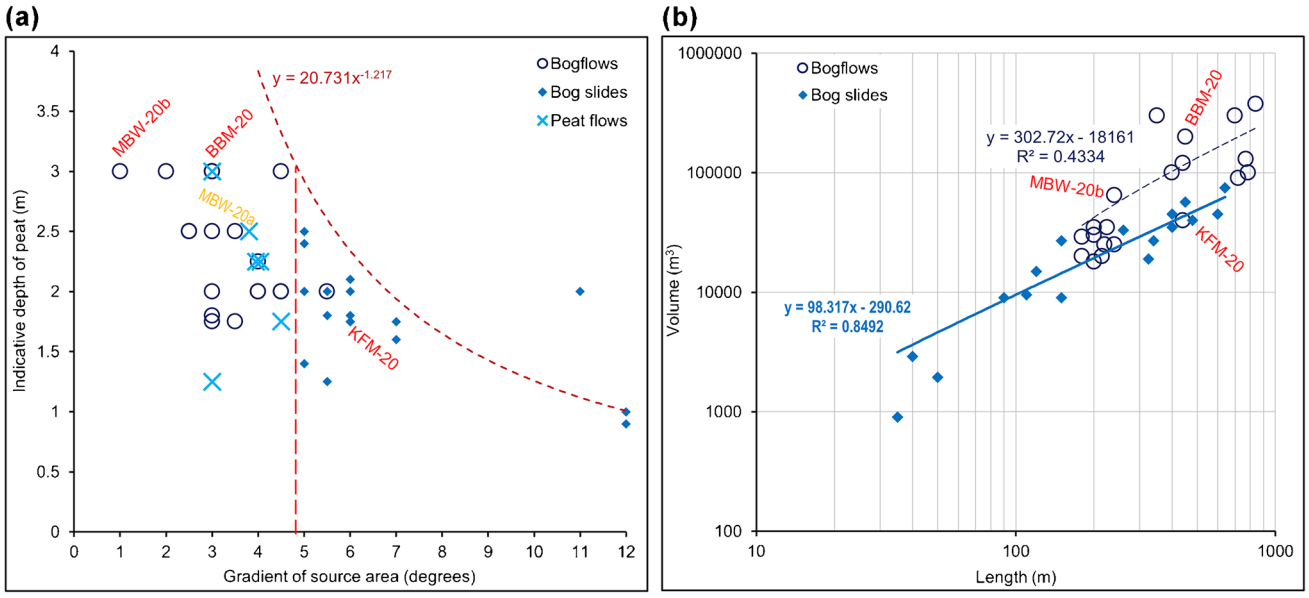

Fig. 8 Geometrical characteristics of Irish bogflows and bog slides, showing how the 2020 landslides compare with earlier examples. **a** Gradient vs. estimated peat depth showing an empirical threshold from Co. Mayo (after Dykes and Warburton 2007a). **b** Volume of displaced peat vs. centre-line length of source area

warmer, drier summers but with a generally higher frequency of high magnitude rainfall events may be expected to cause more such landslides in the spring or summer than has been the case over the last century. Figure 7a suggests an increasing frequency of these types of failures but this may reflect greater scientific and management interest in recent years with more detailed and complete reporting of events.

All three of the landslides in this study involved blanket bog subjected to commercial forestry to some extent. A previous study suggested that mature forests provide a significantly reduced susceptibility to failure of the peat due to the combination of root reinforcement and drying of the peat by evapotranspiration processes (including interception losses) as a forest grows and matures (Dykes 2012). However, pre-forestry drainage and deep ploughing leave deep peat susceptible to failure from concentration of diverted runoff at certain slope locations or zones (Hendrick 1990), at least for the first few years while the peat remains substantially saturated but structurally weakened by the interventions. Cross-slope ditches associated with forestry sites, including drainage for the roads, may create longer lasting weaknesses, effectively removing toe support for the peat upslope of the excavations. This may have been a contributory factor for KFM-20, as observed elsewhere (e.g. Lindsay and Bragg 2005), with the reinforcing effects of the mature forest being overcome by the developing instability on the much steeper lower part of the slope. At BBM-20, it seems likely that forestry plough lines and drains passing a high volume of excess runoff towards an area of deep blanket bog constituted a significant causal factor, but that further retrogression of the failure was restricted by either the root networks or possibly because the peat mass was not continuous. At Meenbog, forestry drainage probably had little influence on the initial head-loaded peat flow (MBW-20a) due to low antecedent rainfall, but the net effect of the forest was to limit the lateral expansion of the subsequent bogflow (MBW-2b). Attention should perhaps be focused on reviewing the susceptibility to failure of intact blanket bogs outside the downslope edges of plantations.

Conclusions

The occurrence of three large bogflows and/or bog slides in a single year is exceptional given the average of 0.3 such (reported) events per year over the last 130 years. Two were most likely triggered by high but not exceptional rainfall, and the third appears to have been initiated by a separate head-loaded peat flow associated with construction of a windfarm access road. Remote investigations were made possible by the current trend of ordinary people to obtain photos or videos of unusual things and to post them on-line to be viewed by anyone. Examination of such non-field evidence suggests that all three landslides have site characteristics that are consistent with known risk factors, particularly convex breaks of slope but also the structural and hydrological effects of forestry plough lines and ditches. At BBM-20, these forestry modifications to the bog probably contributed hydrologically to the occurrence of the failure, and possibly structurally at KFM-20, but at the same time further retrogression of BBM-20 and MBW-20b into adjacent forest may have been retarded by the preventative effects of root networks and evapotranspiration. Finally, the geometric characteristics of the source areas are consistent with the reported ranges of values from previous failures. As such, there do not appear to be any novel or unexpected features among the three recent landslides.

Acknowledgements

I am grateful to the owners of the videos for their respective permissions to reproduce images from those videos.

Author contribution

APD: All.

Data availability

Data sharing is not applicable to this article as no datasets were generated during the current study.

Declarations

Conflict of interest The author was included in a bid for a contract to investigate these landslides; this paper was almost complete by the time of the tender deadline.

References

AGEC (2017) Peat stability assessment report for Meenbog Wind Farm, Co. Donegal. Report prepared for McCarthy Keville O'Sullivan by AGEC Ltd., Bagenalstown, Ireland. Available at: https://www.pleanala.ie/publicaccess/EIAR-NIS/300460/EIAR%20Appendices/Appendix%208.1%20-%20Peat%20Stability%20Assessment%20Report.pdf. Accessed 8 July 2021

Alexander RW, Coxon P, Thorn R (1985) Bog flows in south-east Sligo and south-west Leitrim. In Thorn R (ed) Field guide no. 8: Sligo and West Leitrim. Irish Association for Quaternary Studies, 58–80

Boylan N, Jennings P, Long M (2008) Peat slope failure in Ireland. Q J Eng Geol Hydrogeol 41:93–108

Brunsden D (1993) Mass movement; the research frontier and beyond: a geomorphological approach. Geomorphology 7:85–128

Carlsten P (1993) Peat - geotechnical properties and up-to-date methods of design and construction. State-of-the-art-report 2nd edn. Swedish Geotechnical Institute, Report No. 215, Linköping

Colhoun EA, Common R, Cruikshank MM (1965) Recent bog flows and debris slides in the north of Ireland. Sci Proc R Dublin Soc Ser A 2:163–174

Derg Media (2020) Meenbog Peet [sic] Bog Slide (YouTube video). Available at: https://www.youtube.com/watch?v=xbQe55YnW5g. Accessed 16 August 2021

Donegal Daily (2020) Peat slippage in Donegal November 2020 (YouTube video). Available at: https://www.youtube.com/watch?v=rf6S9Uz2Zrw. Accessed 16 August 2021
Dykes AP (2008a) Natural and anthropogenic causes of peat instability and landslides. In: Farrell C, Feehan J (eds) After wise use – the future of peatlands. Proceedings of the 13th International Peat Congress (Volume 1). International Peat Society, Jyväskylä, pp 39–42
Dykes AP (2008b) Geomorphological maps of Irish peat landslides created using hand-held GPS. J Maps 2008:258–276
Dykes AP (2008c) Tensile strength of peat and its role in Irish blanket bog failures. Landslides 5:417–429
Dykes AP (2009) Geomorphological maps of Irish peat landslides created using hand-held GPS – Second Edition. J Maps 2009:179–185
Dykes AP (2012) The role of forestry in the failure of peat-covered slopes in Ireland. In Eberhardt E, Froese C, Turner AK, Leroueil S (eds) Landslides and engineered slopes: protecting society through improved understanding (Vol. 2). Proceedings of the 11th International and 2nd North American Symposium on Landslides and Engineered Slopes. CRC Press, London, pp 1649–1655
Dykes AP (2019) Recent peat slide in Co. Antrim extends the known range of weak basal peat across Ireland. Environ Geotech. https://doi.org/10.1680/jenge.17.00088
Dykes AP, Jennings P (2011) Peat slope failures and other mass movements in western Ireland, August 2008. Q J Eng Geol Hydrogeol 44:5–16
Dykes AP, Kirk KJ (2006) Slope instability and mass movements in peat deposits. In: Martini IP, Martínez Cortizas A, Chesworth W (eds) Peatlands: evolution and records of environmental and climate changes. Elsevier, Amsterdam, pp 377–406
Dykes AP, Selkirk-Bell JM (2010) Landslides in blanket peat on subantarctic islands: Causes, characteristics and global significance. Geomorphology 124:215–228
Dykes AP, Warburton J (2007a) Geomorphological and subsurface drainage controls on failures of peat-covered hillslopes triggered by extreme rainfall. Earth Surf Proc Land 32:1841–1862
Dykes AP, Warburton J (2007b) Mass movements in peat: a formal classification scheme. Geomorphology 86:73–93
Dykes AP, Warburton J (2008) Characteristics of the Shetland Islands (UK) peat slides of 19 September 2003. Landslides 5:213–226
Dykes AP, Gunn J, Convery (née Kirk) KJ (2008) Landslides in blanket peat on Cuilcagh Mountain, Northern Ireland. Geomorphology 102:325–340
Flynn J (2020) Dawn of Hope landslide (YouTube video). Available at: https://www.youtube.com/watch?v=ttJsyGSBPcc. Accessed 16 August 2021
FoteuMadio ES, Dykes AP (2018) Botanical and geotechnical characterisation of blanket peat at three Irish bogflows. Environ Geotech. https://doi.org/10.1680/jenge.17.00089
GSI (2021) Geology map viewer (1:100,000). Available at: https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&scale=0. Accessed 16 August 2021
Hendrick E (1990) A bog flow at Bellacorrick Forest, Co. Mayo. Irish For 47:32–44
Hobbs NB (1986) Mire morphology and the properties and behaviour of some British and foreign peats. Q J Eng Geol 19:7–80
Holden J, Burt TP (2003) Hydrological studies on blanket peat: the significance of the acrotelm-catotelm model. J Ecol 91:103–113
Lindsay R, Bragg O (2005) Wind farms and blanket peat - a report on the Derrybrien bog slide (2nd Edition). Derrybrien Development Cooperative Ltd., Gort, Co Galway. Available at: https://repository.uel.ac.uk/download/db46ae144c4d0dbc6a41cfe6252f4b75c4637f6c7c23bf70e46cf2b109c85ad2/4740267/Lindsay%2C%20R%20%282005%29%20Derrybrien%20bog%20slide.pdf. Accessed 16 August 2021
Lindsay RA, Charman DJ, Everingham F, O'Reilly RM, Palmer MA, Rowell TA, Stroud PH (1988) The flow country: the peatlands of Caithness and Sutherland. Nature Conservancy Council, Peterborough
Long M, Jennings P (2006) Analysis of the peat slide at Pollatomish, County Mayo, Ireland. Landslides 3:51–61
McCahon CP, Carling PA, Pascoe D (1987) Chemical and ecological effects of a Pennine peat-slide. Environ Pollut 45:275–289
Met Éireann (2020a) Past weather statement for June 2020. Irish Meteorological Service, Department of Housing, Local Government and Heritage, Dublin. Available at: https://www.met.ie/climate/past-weather-statements. Accessed 16 August 2021
Met Éireann (2020b) Daily data. Irish Meteorological Service, Department of Housing, Local Government and Heritage, Dublin. Available at: https://www.met.ie/climate/available-data/daily-data. Accessed 16 August 2021
Mitchell GF (1938) On a recent bog-flow in the Co Wicklow. Sci Proc R Dublin Soc 22:49–54 (+ Plate 1)
NPWS (2013) Site Synopsis: Boleybrack Mountain SAC (Site Code: 002032). National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin. Available at: https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002032.pdf. Accessed 16 August 2021
O'Kelly BC (2015) Atterberg limits are not appropriate for peat soils. Geotech Res 2:123–134
O'Kelly BC (2017) Measurement, interpretation and recommended use of laboratory strength properties of fibrous peat. Geotech Res 4:136–171
OSI (2004) Discovery Series Sheet 26 (1:50,000 map, 2nd Edn.). Ordnance Survey Ireland, Dublin
OSI (2006) Discovery Series Sheet 72 (1:50,000 map, 3rd Edn.). Ordnance Survey Ireland, Dublin
Petley DN (2020) Dawn of Hope: a major peat landslide in County Leitrim, Republic of Ireland. The Landslide Blog. American Geophysical Union, Washington DC. Available at: https://blogs.agu.org/landslideblog/2020/07/01/dawn-of-hope-1/. Accessed 16 August 2021
Save Kerry (2020a) Bog-slide in Mt Eagle County Kerry (video posted to Twitter). Available at: https://mobile.twitter.com/savekerry/status/1328059773825257475?lang=en-GB. Accessed 16 August 2021
Save Kerry (2020b) Further video footage from the bog slide near Mt Eagle in East Kerry (video posted to Twitter). Available at: https://twitter.com/savekerry/status/1328342795795492866?lang=en. Accessed 16 August 2021
Tomlinson RW, Gardiner T (1982) Seven bog slides in the Slieve-An-Orra Hills, County Antrim. J Earth Sci R Dublin Soc 5:1–9
Warburton J, Holden J, Mills AJ (2004) Hydrological controls of surficial mass movements in peat. Earth-Sci Rev 67:139–156
Wilson P, Griffiths D, Carter C (1996) Characteristics, impacts and causes of the Carntogher bog-flow, Sperrin Mountains, Northern Ireland. Scott Geogr Mag 112:39–46
Yang J, Dykes AP (2006) The liquid limit of peat and its application to the understanding of Irish blanket bog failures. Landslides 3:205–216

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C5

Watercourses in the Community - Essential Extracts

Key extracts supporting the principle that watercourses, burns, drainage routes, floodplains and catchments are connected systems and that development should not increase runoff, flooding or pollution downstream.

Extract note: Only key pages are included because the full guidance document is long.

Source file: watercourses_in_the_community.pdf

1. The Importance of Urban Watercourses

Burns and rivers - beauty, richness - and a powerful force in the landscape

The Scottish landscape has developed over tens of thousands of years, and water has played a major role: eroding rocks and soil, and moving and depositing silt, sand and gravel. A rich variety of plants and animals has evolved in these conditions. A natural river, the land through which it flows and the life it supports are intertwined. There are many different types of river but some of the most common features are:

- pools and riffles - in many natural watercourses a chain forms, linking pools of slow flowing water with fast flowing riffles. The riffles increase the oxygen levels in the water. Both offer different habitats for fish and other wildlife.
- gravel beds - a natural watercourse carries substantial quantities of gravel and sediment. The gravel beds provide an important wildlife habitat and are essential breeding grounds for many fish.
- meanders - develop where the watercourse is gently descending.
- floodplain - an area of land which floods when flows are high. The flood plain stores water and sediment, which reduces peak flows downstream.
- bankside vegetation - trees naturally reinforce the banks and reduce the rate of erosion. The leaves add to the food supply and provide shade, which helps keep the water cool in summer and reduces excessive growth of vegetation in the water.

Watercourses are dynamic by nature - they vary from slow meandering streams to bubbling rapids.
Upper Spey © P A Mcdonald

Shee Water, Glenshee. © *George Logan*

Most urban watercourses play no part in the life of the town. They benefit neither people nor nature. It is the smaller rivers and burns that have been lost or degraded to the greatest extent. ©*RPH Ravensbourne*

A typical urban watercourse

Ours is often a legacy of buried watercourses, concrete culverts, environmental damage and uncompromising ugliness. We also have significant amounts of development in areas which flood. But there is great potential to make good.

Common features of urban watercourses

Often of little value to nature

- concrete and steel lined channels and culverts, outfalls and flap-valves surrounded with concrete, banks protected with concrete and steel;
- artificially straightened channels - no meanders, pools or riffles;
- high flood embankments;
- mechanically excavated channels - with steep, sparsely vegetated banks;

Often of little value to people

- cut off from the life of the town, hidden behind fences and walls, buried in pipes, with no public access. Most urban development excludes watercourses, placing them at the back of buildings and gardens. There is an "out-of-sight out-of-mind" mentality which regards watercourses as a safety hazard and an inconvenience.
- marred by refuse and litter - including large items such as shopping trolleys.

GARDY-LOO. While people were dying in epidemics the preservation of natural habitats was of secondary importance. Watercourses were considered part of the problem.

Watercourse or sewer? - or both?
A typical urban stream with culverting and associated cross connection problems. *Edinburgh © SEPA*

Many watercourses have been modified with one objective in mind - the unimpeded movement of water. They offer little for people or wildlife. Some have been lined with concrete to cope with the increased storm flows caused by urbanisation. © *RPH*

How is it we have ignored our urban watercourses?

The water environment has been so important to the development of our towns and cities, with uses ranging from drinking and a source of food, to transport and power. It seems incredible that it plays so small a part today. But there are good reasons.

Early days of drainage

Right from the earliest days of the development of towns, watercourses were used as sewers. Once used in that way, there was never any reason to incorporate them positively into the town. The Victorians believed that sewage gas odours spread infectious and fatal diseases. Many watercourses were subsequently buried in pipes. While the Victorians clearly valued nature, and created many of today's urban parks, the industrial revolution was largely at the expense of the natural environment. The main effort was directed at the alleviation of poverty, malnutrition and epidemics rather than the general protection of the environment.

To increase drainage both of agricultural land and of towns, burns and rivers were often straightened and deepened. The faster flows of water broke the natural equilibrium of the watercourses and increased erosion and the transfer of gravels and sediments. Downstream this brought problems of increased flooding and sediment deposition. Having interfered once, ongoing maintenance would then be necessary to prevent the clogging of channels and erosion of banks. New flood embankments would be needed downstream to cope with the increased flows. The Victorians had no science of catchment management, nor understanding of hydraulics, hydrology and geomorphology. People were unable to foresee the consequences of large-scale changes to the drainage of a river catchment.

There were no administrative structures in place able to manage water over a wide catchment. Flooding problems were dealt with at a local level, mostly by building up flood banks and by straightening rivers, transferring the problem downstream. Also, towns were being developed and managed independently of the management of watercourses, so the exclusion of urban watercourses from towns was a bureaucratic inevitability.

Growing Towns - the pressure of development

Through the 19th and 20th centuries urban streets were being progressively re-surfaced with waterproof concrete and tarmac and greenfields were being replaced with buildings, so rain which would once have slowly drained off or filtered into the soil, would, instead, drain rapidly into watercourses by a direct network of pipes. Again, the same combination of increased storm flows and new flooding problems arose resulting in the same answer: to build up flood protection banks, straighten meanders, and replace natural channels with concrete.

Hungry for land, towns sometimes expanded into natural floodplains. "Living memory" failed to warn against development in areas prone to flooding; and when the development did flood, there would be strong pressure for flood protection works. These embankments, while tackling the local problem, blocked off the floodplains that had previously absorbed flood waters, causing more water to be channelled downstream, and with it, the danger of flooding elsewhere.

Developers found it easier to put watercourses into underground culverts and then overlay a standard road layout, rather than "work" the development in around the watercourse. The consequence has been developments which are structured for convenience rather than natural beauty, and are impossible to tell apart.

We are increasingly being left with a network of buried watercourses which do nothing to enrich the communities through which they flow.

Development on natural flood plains inevitably leads to flooded buildings, unless flood embankments and pumping stations are provided.
Flooding near factory, Elgin © A R Black

Safety concerns

Safety concerns were dealt with by excluding people rather than eliminating the hazard. Safety improvements invariably meant fencing-off the watercourse or putting it underground in a culvert, rather than introducing measures to make the watercourse inherently safer. Such measures work so long as they keep people out. But agile children can climb most types of fencing and, unless regularly maintained and inspected, fencing can become broken down. People are kept out of culverts by heavy grills at either end. These grills can collect debris and become blocked, contributing to the flood hazard. There have also been examples of youngsters launching determined attacks on grills to open the culvert to exploration. To resist attack, grills have to be heavy and expensive.

Rather than incorporate watercourses into the life of a town, the traditional option has been to bury them in culverts. © *A Church, SEPA*

And so...

Having started with burns and rivers that were attractive to people, full of life, and cost nothing to maintain, we have developed a system of underground drains, reinforced river banks, flood protection schemes, pumping stations, concrete channels, grills and fences, which is an ongoing cost to the community and provides, at best, a single benefit and, at worst, causes problems.

There can be no question of blaming past generations who acted in good faith on the knowledge available then. But perhaps we should blame ourselves if we continue in the traditional ways, when engineering and science now offer far more effective, economical, and sustainable alternatives.

Traditionally we have tried to deal with safety by removing public access, rather than removing the hazards. © *SEPA*

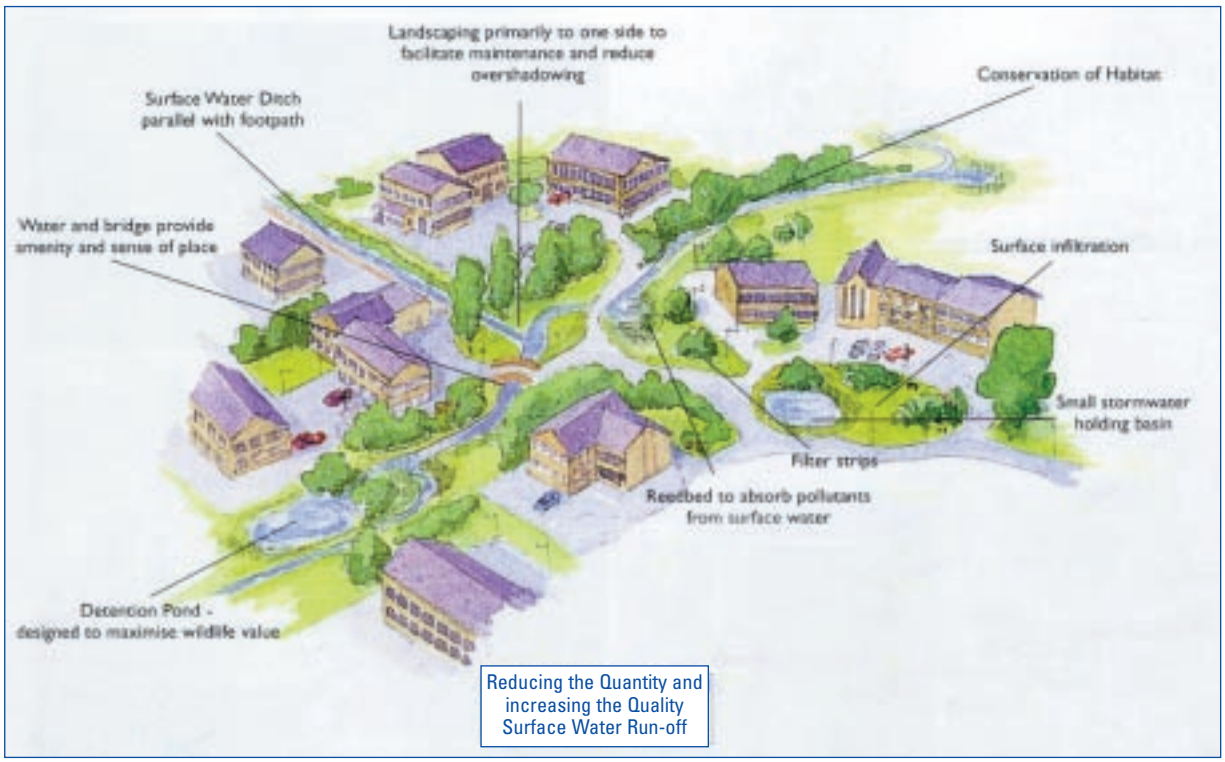
3 Some Ideas on Applying the Techniques

This section provides some ideas on what to do with various types of watercourse under different circumstances. In all instances it is important to:

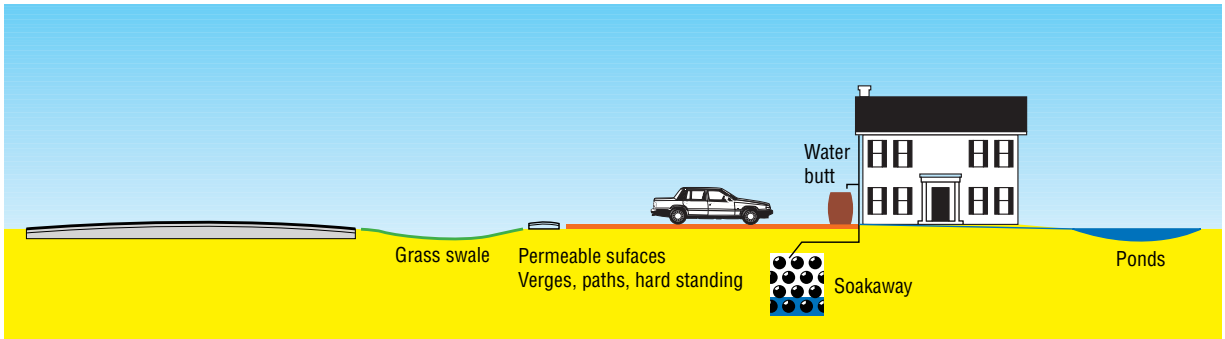
- consider the whole catchment - where there are likely to be effects;
- avoid damaging existing habitats;
- make sure the proposals work, as well as look good;
- balance human need with nature;
- produce an original, thought-through scheme rather than copy other schemes or practices.

All new developments - an opportunity to use Sustainable Urban Drainage Systems (SUDS)

Thousands of pounds can be saved in new developments by using SUDS. By reducing run-off, the need for expensive new piped drainage systems can be reduced or even avoided. The techniques reduce pollution of watercourses and downstream flooding. Some SUDS incorporating ponds and swales can increase the attractiveness of a development. Equipping new houses with water storage butts from the outset may also reduce run-off.



Reducing the Quantity and increasing the Quality Surface Water Run-off



Some examples of sustainable urban drainage features that could be applied to an everyday house.

Step 1 - Understanding

Knowledge of burns, rivers and catchments

Few people, when they look at a burn or a river, perceive the complexity and power of the water. Over thousands of years, a complex relationship develops between the flow of water, the form of the landscape, the animals and plants, and the water chemistry. The study of these relationships is the subject of specialist scientific disciplines, including:

- fluvial geomorphology
- ecology
- hydrology
- biochemistry

Together, these sciences are providing us with a far better understanding of rivers, and the resulting effects of human intervention.

The following descriptions are examples which show the sort of problems that could arise before we developed an understanding:

During the Victorian period in Scotland, to improve the drainage of a piece of land a meandering river was often replaced by a cut which provided a shorter path for the water, but at a much steeper gradient. No sooner had the new cut been opened than the rapid flow of water would severely erode the banks and deposit new sediments in the lower sections, causing new problems downstream.

In the 1930s, towns which were subject to flooding were often protected by the deepening and widening of the river. However, the deepened section would often rapidly fill with gravel carried down by the river from upstream. The maintenance of the section would in some instances involve the removal each year of several thousand tonnes of gravel.

It must be remembered that rivers are ruled by the forces of nature. They adjust their channel dimensions, gradients and meanders in relation to flow and sediments. Irrespective of what man does, nature will try to restore this natural equilibrium. The trick is to use expertise to do what nature would do in the first place. There are three tasks:

- make the drainage system more natural;
- ensure the watercourses are as natural as possible;
- avoid confronting nature by building on land prone to flooding.

Step 2 - Techniques

Source control techniques can be used to control and reduce run-off from new urban development. These techniques can also be used to remove pollutants from the water.

The techniques reduce flooding by slowing the rate at which the rain discharges into watercourses. By slowing the flow, some of the suspended solids in the water settle out and bacteria, microbes and larger plants have time to reduce the nutrient levels in the water, and tackle some of the other pollutants - so that when the water finally reaches a watercourse the level of contamination is much reduced. Some of the techniques also help to replenish ground water; this also helps to sustain summer flows in watercourses.

Applying the science

Rivers are complicated systems that we need to incorporate and plan for at a catchment scale. When we do make a substantial intervention we need to be using the best information from an integrated science.

Fluvial geomorphology
the study of the evolution of landforms shaped by rivers and the processes involved has given us a far better understanding of the role of erosion and the deposition of gravels and other sediments.

Biochemistry
how the chemistry of the water can be affected by changes in the drainage pattern, in the use of fertilisers, pollution from development (including phosphates from washing machines and people washing their cars and wheelie bins which, via road drains, discharge directly into rivers), plus more subtle biochemical changes that can be caused by interfering with the bed of the watercourse or its banks.

Ecology
has brought an understanding of the interdependence of organisms and habitats, and how a single watercourse can affect wildlife far beyond its immediate banks.

Hydraulic modelling
can be used to predict the effect of changes in the watercourse, such as deepening a channel, straightening a watercourse or introducing flood embankments. Because of the complexity of watercourses and catchments, it is important that no major changes are made to watercourses, floodplains or flood protection embankments without using these tools to consider both the local impact and the impact on the whole catchment.

By using urban drainage systems upstream, pictures like this could be come a thing of the past. © *RPH*

Step 4 - Tasks

Flood Prevention

The risk posed by upstream development

Urban development upstream will increase run-off and the risk of flooding downstream unless Sustainable Urban Drainage techniques are utilised (see the previous section on pages 26 and 27). It is important that these techniques are used extensively.

Control development in the flood plain

Flooding is a natural process and the flooding of property occurs because properties have been built in the flood plain. Planners and developers should be aware that a flood risk assessment provides a guide to the risk of flooding, not a guarantee against flooding. Planning applications should be assessed with flood risk in mind, and developers should be encouraged to consider using every topographical advantage of their site to minimise the effects of any floods.

Where development has taken place in a flood plain, be aware that flood defence measures can increase the risk of flooding downstream.

Physical measures

Flood banks

Flood defence banks should be built away from the natural channel (where space permits) to preserve the river margins and encourage habitat creation for such species as water voles and otters. By setting them back, they can be smaller, cheaper to construct and less visually intrusive, yet still contain the same flow.

Flood relief channels

Flood relief channels can be used to divert high flows away from a natural channel. Once freed of heavy storm flows, there are opportunities to re-profile and replant the natural channel. Examples can be obtained from the River Restoration Centre.

Culverting

Exceptionally, new culverts will be required, although developers will need to demonstrate that there is no alternative as well as incorporate fish passes. Ideally, follow the SEPA Policy on culverting and work to CIRIA Culvert Design Manual - CIRIA Report 168. If there is a need to cross a watercourse, a bridge may be less environmentally damaging and a more attractive option.

Flooding and 'soft' engineering

Government guidance on Planning and Flooding issued in National Planning Policy Guideline 7 in 1995 clearly recommends that 'the threat of flooding should be managed in an environmentally sensitive way. The role of soft engineering techniques such as natural flood meadows and washlands in attenuating flooding should be recognised and additional flood protection measures should only be adopted after full consideration of all available techniques which can provide the appropriate level of protection...'

Flooding can cause extensive damage to property and misery to the owners. © *G Burns, SCP*

What causes flooding?

Heavy rainfall over a large catchment - causing widespread flooding

Rapid melting of snow in the hills and mountains - major snow melts require a rapid rise in air temperature accompanied by heavy rain.

Summer thunderstorms which cause local flooding, especially in urban areas, where development has replaced absorbent fields and forests with rapidly draining surfaces such as roads and roofs.

Insufficient maintenance of man-made watercourses, culverts, gullies and other artificial drainage features.

Modifications to watercourses and floodplains which increase the speed at which water drains off the catchment, including canalisation, construction of flood embankments and changes in forestry and agricultural practices.

Urban development which reduces the amount of rainfall absorbed and increases the amount and rate at which it drains into watercourses.

What causes the flooding of property? Inappropriate development within floodplains.

Road Safety vs Water Safety

The main difference between road safety and water safety is that on the roads or pavements one can be the victim of someone else's actions. Eight percent of pedestrian accidents occur while the pedestrian is on the pavement. Given the choice between encouraging people to spend time by the riverside, as opposed to the roadside, the riverside will be safer every time.

Natural watercourses vs man-made watercourses

Natural watercourses are inherently safer than man made drainage systems:

- they are less prone to flooding, especially flash flooding;
- there are no grills or pipes into which children can be attracted, and become trapped;
- the banks tend to be more gently sloping - making it easier for someone who has fallen in to clamber out.

Media coverage

Drownings in rivers and burns receive high profile press coverage because they are rare. On average, 10 people a day die on British roads, but the incidents go largely unreported. Nor are there calls for all roads to be fenced-off.

During summer days, such as this one below, water attracts people by the hordes. Safety in these kinds of situations is paramount.

When does a fun day out at the coast become a risk? We need to do all we can to ensure our children's safety by educating them about our environment.
© Doug Corrance, Still Moving Picture Company

Step 5 - Actions

Safety

The safety of urban watercourses can be a major public concern, particularly where people are hoping to restore a watercourse. There are risks involved with watercourses, and they should be logically assessed and where they do present a hazard, measures should be taken to reduce the hazard to a sensible level.

Human error - one of many causes of accidents

It is important to tackle safety as an issue that involves a number of solutions rather than going for a single solution approach. Most accidents involving water are the result of several different factors, and human error, misjudgement or misadventure normally figure highly. Some accidents occur because people are unaware of dangers or ignore the dangers, eg walking out over a frozen lake. Some occur where people overestimate their ability - such as swimming in cold water or because their attention is distracted. The number of accidents where water is the sole cause are small - an example might be a flash flood or an exceptionally severe flood.

Four routes to the safe enjoyment of watercourses

1. **Education** - sensible behaviour around watercourses needs to be part of the general education on the value of water, including the risks of ice, deep water and cold. The resulting effects of rubbish dumping, such as pollution and rats for example, should also be taught. (Education can also help people distinguish between disease carrying rats and threatened water vole communities).

2. **Changing the watercourse**
   - a bank with one in four slopes will normally allow people to clamber out;
   - use two-stage channels, to reduce steep gradients;
   - vegetation - reed shelves by the edge of the watercourse can act as a barrier to entry.

   Changes to the watercourse need to be carefully assessed as erosion and deposition further downstream can be an unintended consequence. In some instances, the danger will be man-made where the watercourse has been put into a concrete channel with vertical sides, making it hard to clamber out should an accident occur.

   Re-channelling should be approved before any action is taken, as it could cause unwanted scouring in areas of land, or even uncover landfill sites from years ago. Consult with the British Geological Society and 'Dial before you dig'.

3. **Safety aids** - such as grab rails, ladders, life-buoys can be included.

4. **Keeping people away from danger** - fencing or railing can be used to protect people from vertical drops, barrier planting can be also used. Low fencing can be used to halt toddlers.

The River Clyde running through the centre of Glasgow. © *P A Macdonald, SNH*

Design guidance. Education is an important part of the process. © *Wilcon Homes*

Guidance may include advice that:

- SEPA and SNH should be consulted at an early stage
- Habitat and species surveys, should be undertaken before plans are prepared.
- Watercourses should be left unchanged if their habitat quality is good, otherwise physical modifications may be needed to change flow patterns. If not carried out carefully there may be a risk of erosion, siltation and increased flooding further downstream.
- Development should not be encouraged on the flood plain.
- Having taken consideration of the above point, development should incorporate the watercourses as a positive aspect creating a clear identity for the development, greater attractiveness, and potentially greater value. Ideally, development should face the watercourse rather than access roads.
- Safety measures should be considered where necessary, such as grading back artificially steepened banks to improve public access and safety and increase flood protection potential. However safety should not be taken to a phobic extreme that sees the watercourse sterilised and isolated. It is safe behaviour that is particularly important.
- Public rights of way along watercourses should be considered with a view towards linking adjoining sites. However, their design needs to be in keeping with the watercourse and a balance should be struck with the natural habitat. Sometimes, walkways should be run down just one side of the river to leave the other as a haven for wildlife.
- Channellised watercourses can be restored through reintroducing natural features such as pools and riffles etc., to increase visual amenity, form new habitats, and to increase flood protection potential.
- Hard engineering measures, such as concrete faced outlets and walls, should be avoided and soft engineering alternatives should be used in preference, eg stabilisation of banks using vegetation.
- Appropriate landscaping should be provided, with a natural emphasis including trees to provide shading and control vegetation within the watercourse.
- Opportunities to integrate habitat enhancement and public recreation, including angling, be sought and promoted.

Development control

- Ensure all new major developments incorporate a Sustainable Urban Drainage approach - minimise the area of impermeable surfaces created in new developments by careful attention to site layout, minimising pavement and tarmac space, minimise the area of impermeable surfaces.
- Ensure plans for the treatment of watercourses and drainage on the site are submitted at the same time, and preferably as part of the detailed planning application. Insist that the plans mark the watercourses and proposed treatments.
- Check that the promoters have obtained advice on flood risk, and have assessed the habitats and species in and around the site and watercourses. Ensure wildlife suvey results are included.
- Resist development which contravenes SEPA policies on culverting.
- Encourage the developer to realise the potential of the positive use of watercourses as part of a high quality design.

- Ensure no structures restrict free passage of fish up and downstream.
- Ensure pollution is tackled at source before entering the drainage system.

Monitoring and maintenance

A natural watercourse can be among the most attractive features in a town, but unless it is well monitored and maintained it can become an advert for urban decay.

- Set high standards of maintenance, including litter control, and adhere to them. Encourage local communities (for example using the Local Agenda 21 process) to take an interest in the husbandry of their watercourses.
- Ensure the landscaping is designed with maintenance in mind and that funding for future maintenance is safeguarded.
- Where possible, secure long-term funding for the monitoring and maintenance of a watercourse from developers by commuted sum, bonds or other means.

If properly monitored and maintained rivers and burns can become sanctuaries for nature. Heron. © *K Ringland*

8. Glossary

Agenda 21 - A non-binding comprehensive framework for world-wide action, based on 13 environmentally related themes:

- agriculture,
- atmosphere,
- biological diversity,
- biotechology,
- desertification,
- hazardous wastes,
- land management,
- mountains,
- oceans and coastal zones,
- radioactive wastes,
- solid wastes and sewage,
- toxic chemicals,
- water-resources.

The UK Government adopted the framework during the 1992 UN Rio de Janeiro Earth Summit.

BACKWATERS - An old channel of a meandering watercourse that still remains connected to it.

BEST VALUE - The Best Value Act (Local Government Act 1999) put a duty on local authorities to make arrangements to secure the continuous improvement in the way their functions are exercised, and to have regard for a combination of economy, efficiency and effectiveness. All functions of a local authority must be fundamentally reviewed in relation to the four Cs of Compare, Challenge, Compete and Consult within a five year period.

BIODIVERSITY - The variation and number of different living components in an environment including their genetic diversity. The larger the number of species and individuals of one species the larger the gene pool, which ultimately will benefit the ecosystem. In the context of rivers and burns this could be applied to all the living elements within, outside and around these aquatic areas.

BIOCHEMISTRY - The chemical nature of living things. More specifically it is the study of the chemical components that compose the basic make-up for all living things and the reactions and interactions which occur within the organisms body.

BROWNFIELD SITE - Previously developed land. Brownfield sites are often thought to be contaminated; in fact the majority are entirely free from contamination and may provide havens for a wide variety of valuable wildlife species.

CARR HABITATS - Fen vegetation (see below) with trees.

CATCHMENT - The total area of land from which water drains into any given river or reservoir.

CATCHMENT MANAGEMENT - managing the entire drainage area - with the aim of ensuring water is available for different uses, eg irrigation, supply, and minimising erosion and pollution, and to minimise flooding.

COMBINED SEWER - A drainage system taking both waste water from properties and surface water arising from road run-off (Effluent is then taken away to the local Waste Water Treatment Works for treatment).

COMBINED SEWER OVERFLOW - an emergency overflow arrangement from the sewer to the local stream or river, found in areas which are served by a combined sewer. Designed to operate during extreme rainfall events when rain water enters the system and overloads the system. Rather than in a back up of effluent in the drains, the result is a discharge of diluted effluent into the local watercourse.

CULVERT - A covered channel or pipe, which completely encompasses a river or a burn.

ECOLOGY - The scientific study of the interactions between the living components and their environment, with attention to the biological and physical factors, and the external and internal relations.

ECOSYSTEM - A biological community and the physical environment associated with it.

FEN HABITATS - The vegetation that grows on naturally waterlogged land and eventually forms peat.

FLASH FLOODS - in areas with rapidly draining surfaces heavy rainfall can cause the flow in watercourses to rise very quickly and suddenly, sometimes sending a wall of water downstream. The force of the flow can cause damage and carry debris, which may result in blockage and flooding. Urbanisation and positive piped drainage systems increase the risk of flash floods; Sustainable Urban Drainage Systems reduce the risk.

FLUVIAL - Of streams and rivers.

GABIONS - The rectangular steel mesh structures used to build free-draining retaining walls. They are usually basket shaped and filled with rocks.

GEOMORPHOLOGY - The study of the evolution of landforms and the processes involved.

GEOTEXTILE - A strong durable, non-biodegradable sheet of woven plastic, used to reinforce soil, banks, and footpaths.

GREENFIELD SITE - undeveloped land, but maybe intensive agriculture.

GREENSPACE - An area set aside for the protection and enjoyment of nature.

HABITAT - A place where an organism lives.

HYDROLOGY - The study of all forms of water (rain, snow, ice, water) on the earth's surface.

HYDROGEOMORPHOLOGY - The study of the influence of water on of land, and the processes involved.

LADES - (or Leat) an artificial channel diverting water from a burn or river to provide a supply of sufficient height to drive a water wheel.

LANDFILL TAX FUNDING - Use of the levy payable on waste going to landfill for environmentally beneficial works within 10 miles of a landfill site.

Appendix D - Essential Bird, Bat and Biodiversity Evidence

Joseph Sheerin Submission / Observation - Proposed Lissinagroagh Wind Farm

Planning Reference: PAX12.324290 | Current Wind Farm Application: ACP-323048-25 | Design Flexibility / 10-Year Permission: ACP-323910-25 | Grid Connection: ACP-323353-25 (separate but directly related)

D1	Hen Harrier - applicant admissions and compensation uncertainty
D2	Dough Mountain NHA Site Synopsis - blanket bog, streams, flushed channels and wind energy warning
D3	Curlew evidence - Lough MacNean photograph and wider receiving environment
D4	Bat and local biodiversity evidence - T14 shed and sensitive habitats

This reduced appendix keeps only the essential biodiversity material needed to support the main objection. It should be read with the main submission and Appendices A to C.

D1 - Hen Harrier: Applicant Admissions and Compensation Uncertainty

The applicant's own Outline Biodiversity Management Plan / ornithology material is relied on because it contains the central admission: breeding Hen Harriers are likely to be disturbed by the Proposed Project, leading to potential displacement from nesting and foraging areas and possibly resulting in the effective loss of the species from the site. In the absence of mitigation, disturbance is predicted during both construction and operation, particularly due to the presence of operating wind turbines.

The same material records that bird surveys from 2020 to 2025 consistently recorded one to two nesting Hen Harrier within the site and/or surrounding area, including northern and southern pairs. It records that the southern pair attempted to nest annually between 2020 and 2025 and used a corridor approximately 2.5 km in length, shifting nest locations within that area.

These admissions show that the site and surrounding Dough Mountain / Saddle Hill / Faughery / Killea / Boleyboy upland landscape is not marginal habitat. It is a repeated multi-year breeding and foraging territory.

The applicant estimates that 109 hectares of currently suitable Hen Harrier foraging habitat may be lost due to displacement. When future forestry cycles are considered, the estimated loss rises to 140 hectares over the lifetime of the project, including approximately 76 hectares of higher-suitability habitat and 64 hectares of lower-suitability habitat.

The compensation strategy is not avoidance. It relies on uncertain future habitat management, landowner agreements, farm plans, legal enforceability and the hope that Hen Harrier will use replacement lands. The applicant cannot guarantee that Hen Harrier will leave established nesting and foraging territory and successfully transfer to compensation lands.

Essential conclusion: the compensation proposal should be treated as evidence that the turbine layout is fundamentally unsuitable. If the project may result in the effective loss of nationally important Annex I raptor habitat from the site, the correct planning response is avoidance and refusal, not post-consent compensation.

D2 - Dough Mountain NHA Site Synopsis: Blanket Bog, Streams, Flushed Channels and Wind Energy Warning

The Dough Mountain NHA Site Synopsis is relied on because it describes the conservation importance and sensitivity of the receiving environment. It describes the southern side of Dough Mountain as steeper and more exposed, supporting heath vegetation with exposed rock. It records intact blanket bog with good heath and moss cover and peat depths of up to 2 metres.

The Site Synopsis records swards of upland grassland on lower slopes and within the heath and blanket bog mosaic. It specifically describes many narrow streams and flushed channels characterised by rushes, grasses and frequent Heath Spotted-orchid. This is directly relevant to the T5, T13 and T14 concerns about turbine works in areas of narrow streams, flushed channels and natural water movement.

The Site Synopsis also refers to very wet regenerating cutover areas with Ling Heather, Purple Moor-grass, cottongrasses and carpets of bog mosses. It records species including Irish Hare, Common Frog and Red Grouse.

The Site Synopsis states that adjacent land uses include extensive conifer afforestation, peat cutting and grazing, and that these activities have resulted in habitat loss and damage to the hydrological condition of the site. This supports the objection that the hydrology is already sensitive and should not be subjected to further major industrial disturbance.

Most importantly, the Site Synopsis warns that wind energy development may be under consideration and that the placement of access road networks and turbine foundations associated with such developments causes habitat loss and disturbance, destabilises peat and leads to erosion.

Essential conclusion: the proposed turbines, roads, hardstands, borrow pits, drainage works, felling and storage areas are incompatible with the conservation significance, wet hydrology, flushed channels, peat stability risk and sensitive management needs of Dough Mountain NHA.

D3 - Curlew Evidence: Lough MacNean and Wider Receiving Environment

Photograph D3.1 - Curlews feeding on a sandbank at Lough MacNean. This photograph is relied on as local evidence that the wider receiving environment supports sensitive bird species and that bird assessment should not be confined narrowly to turbine locations or the red-line site boundary.

This evidence supports the argument that the assessment must consider wider lakes, wetlands, river corridors and feeding areas used by sensitive bird species. Lough MacNean forms part of the wider upland and downstream ecological system potentially affected by disturbance, hydrological change, peat movement, pollution pathways and cumulative wind energy impacts.

Essential conclusion: the EIAR should assess birds across the functional landscape, not only at turbine locations. The relevant landscape includes Lough MacNean, Lough Melvin, Dough Mountain, river corridors, surrounding uplands, wetlands and known feeding / movement areas.

D4 - Bat and Local Biodiversity Evidence

Photograph D4.1 - Local biodiversity evidence, including nesting/riverbank habitat. This photograph is included as supporting local evidence that the wider receiving environment contains sensitive habitats and species beyond the turbine hardstand footprint.

Local evidence also identifies bats in the shed beside proposed T14. This is material because T14 is already a sensitive location in the objection due to narrow streams, flushed channels, restricted access, peat, water movement and biodiversity risk.

The bat evidence should be assessed in relation to roost potential, commuting corridors, foraging habitat, lighting, turbine collision / barotrauma risk, construction disturbance and the adequacy of buffers. It should not be left to post-consent survey or mitigation.

Essential conclusion: the biodiversity assessment should not treat local wildlife evidence as incidental. The presence of bats near T14, Curlew evidence at Lough MacNean, Hen Harrier nesting and Dough Mountain NHA habitats together show that this is a functioning ecological system requiring avoidance rather than compensation or after-consent mitigation.