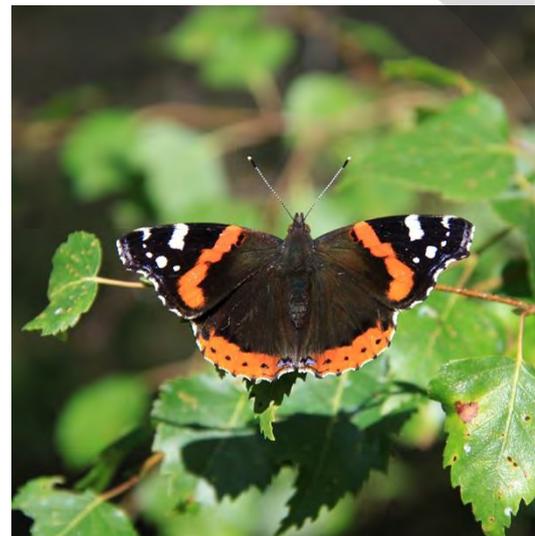


ScottishPower Renewables

Whitelee Windfarm Extension - Solar PV, Green Hydrogen Production and Battery Storage Facilities

Request for EIA Screening
Opinion



Report for

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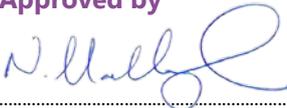
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Document revisions

No.	Details	Date
1	Initial Draft for Client Review	08.10.2020
2	Finalised Draft	12.10.2020
3	For Issue 43122-WOOD-XX-02-RP-T-0001_S3_R3	14.10.2020

Executive summary

Purpose of this report

This report has been produced for the purpose of seeking a formal Environmental Impact Assessment (EIA) screening opinion in respect of a proposed solar photovoltaic (PV), green hydrogen production facility and battery storage facility on land to the west of Whitelee Windfarm Extension within the administrative boundary of East Ayrshire. The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) allow for a developer to request a screening opinion from the relevant authority to assess whether the development is considered to be an EIA development. The regulations require that a screening opinion request be accompanied by a plan sufficient to identify the land alongside a brief description of the development itself and of the potential effects on the environment as well as any other information as is deemed to be necessary. This report and its associated appendices comprise such a request.

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1. Introduction

1.1 Overview

1.1.1 Wood Group UK Limited ('Wood') submit this document as a request for a screening opinion under Regulation 8 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) ('the EIA Regulations')¹ in support of an anticipated application to be made under Section 36 of the Electricity Act 1989² and/or Section 32 of the Town and Country Planning (Scotland) Act 1997 (as amended)³ ('the Act') on behalf of ScottishPower Renewables (UK) Limited ('the Applicant/SPR'). The purpose of this screening request is to establish the likelihood of the requirement for an Environmental Impact Assessment (EIA) - including an accompanying Environmental Impact Assessment Report ('EIAR') - for a proposed combined solar PV farm, green hydrogen production facility and Battery Energy Storage System (BESS) ('the Proposed Development') located at the sites previously identified for the Whitelee Windfarm Extension Phase 3, immediately west of the existing Whitelee Windfarm. All components are located at Eaglesham Moor and connect into the Whitelee Windfarm Extension substation and all components are within the administrative boundary of East Ayrshire (the 'site').

1.2 Requirements for an EIA screening request

1.2.1 The Proposed Development falls within Schedule 2, Section 3(a) as an industrial installation that exceeds 0.5 Ha. It is the determining authority's responsibility to provide a screening opinion on whether an EIA is necessary for such developments.

1.2.2 The EIA Regulations set out, under 8(2) that a request for a screening opinion must be accompanied by the following documentation:

1. a description of the location of the development, including a plan sufficient to identify the land. Regulation 8(2)(a);
2. a description of the Proposed Development, including in particular: a description of the physical characteristics of the Proposed Development and, where relevant, of demolition works, and a description of the location of the Proposed Development, with regard to the environmental sensitivity of geographical areas likely to be affected. Regulation 8(2)(b) (i & ii);
3. a description of the aspects of the environment likely to be significantly affected by the Proposed Development. Regulation 8(2)(c); and
4. a description of any likely significant effects, to the extent of the information available on such effects, of the Proposed Development on the environment resulting from: the expected residues and emissions and the production of waste, where relevant, and the use of natural resources, in particular soil, land, water and biodiversity. Regulation 8(2)(d) (i & ii).

1.2.3 In respect of point 1 above, a description of the location of the development is provided within Section 2 below and a copy of the accompanying site plan is shown within the associated Figures included within the various appendices of this document.

¹ <https://www.legislation.gov.uk/ssi/2017/101/made>

² <https://www.legislation.gov.uk/ukpga/1989/29/section/36>

³ <https://www.legislation.gov.uk/ukpga/1997/8/section/32>

- 1.2.4 In respect of point 2 above, a description of the Proposed Development is provided within Section 2 and is accompanied by the following Figures – contained within their relevant appendices:
- Location Plan - Figure 1.1, Appendix A; and
 - Zone of Theoretical Visibility - Figure 43122-WOOD-XX-02-DR-L-0001_S3_R2, Appendix B.
- (please note the above ZTV Figure is based on a preliminary design, which is subject to change, within the boundary of the Location Plan (Appendix A) and within the bounds of the text within the body of this document).*
- 1.2.5 In respect of point 3 above, a description of environmental receptors (i.e. those aspects of the environment likely to be affected by the Proposed Development) is provided within Section 3 below.
- 1.2.6 In respect of point 4 above, a description of predicted significant environmental impacts and their effects on receptors is also provided within Section 3 below.
- 1.2.7 Regulation 8(3) states that the request may also be accompanied by a description of any features of the Proposed Development, or proposed measures, envisaged to avoid or prevent significant adverse effects on the environment. In this regard, Section 3 of this report (relating to Regulation 8(2)(c) and 8(2)(d) respectively) specifically contains narrative information on anticipated measures and mitigation proposed in respect of the Proposed Development to ameliorate any predicted significant environmental effects identified at this stage.

1.3 Project Background

- 1.3.1 SPR is currently in the process of developing a combined solar PV farm and green hydrogen production facility upon land located adjacent to the operational Whitelee Windfarm and Extension, at East Kingswell, within an area previously considered for windfarm development (Whitelee Windfarm Extension Phase 3). The site is located at East Kingswell, immediately to the northwest of the operational Whitelee Site, to the south of the B764 Eaglesham Road and northeast of Kilmarnock on Eaglesham Moor. The M77 and A77 corridor is approximately 775 metres distant from the north-west. The associated BESS facility is located 800m west of the Whitelee Windfarm Extension substation, on the former construction compound for the now operational windfarm.
- 1.3.2 SPR is at the forefront of the development of the renewables industry through pioneering ideas, forward thinking and outstanding innovation. Its ambitious growth plans include expansion of its existing onshore wind portfolio, investment in new large-scale solar deployment and innovative grid storage systems including batteries. The proposed solar PV element adjacent to Whitelee Windfarm is an example of SPR's commitment to investing in large scale solar, with the aim of creating a diverse portfolio not only upon new sites, but further expanding the infrastructure upon operational windfarms such as Whitelee. In addition to the solar PV element, the development will also include a green hydrogen production facility and a battery storage facility. All components will connect into the nearby the Whitelee Windfarm Extension substation. Connecting into Whitelee Windfarm Extension substation is required in order to effectively manage under or oversupply of electricity production from the solar PV element to the hydrogen facility, depending on differing efficiencies at differing seasons. During periods of undersupply from the solar PV scheme, the hydrogen facility can be fed power from the operational Whitelee Windfarm Extension.

1.4 Summary of Consultation

- 1.4.1 Under regulation 8(5) of the EIA Regulations, Scottish Ministers are required to consult the planning authority within whose land the proposed application is situated. East Ayrshire Council ('the local

planning authority') is the administrative authority within which this site is located. Prior to the submission of this screening request, consultation has been undertaken with both the Energy Consents Unit (ECU) and the local planning authority (East Ayrshire Council, "EAC"). For the avoidance of doubt, the listed consultation with the ECU/EAC below comprise only discussions undertaken to date and not the totality of anticipated pre-application consultation for the future application.

- 1.4.2 The following table lists the dates of all consultation between Wood, the Applicant, the Energy Consents Unit and East Ayrshire Council undertaken to date.

Table 1.1 Consultation

Date	Consultee	Attendees	Summary
18.08.2020	ECU	Ruth Findlay (ECU) James McKenzie (ECU) Dan Ferrier (SPR) Jamie Gilliland (SPR) Lewis Monaghan (SPR) Chris Pepper (Wood) Fergus Tickell (Wood)	Initial pre-application discussion and introduction to the Proposed Development by the Applicant and Wood.
10.09.2020	ECU & EAC	Alan Brogan (ECU) James McKenzie (ECU) David Wilson (EAC) Dan Ferrier (SPR) Jamie Gilliland (SPR) Lewis Monaghan (SPR) Chris Pepper (Wood) Fergus Tickell (Wood)	Project introduction to EAC, high level discussion on principles of development within the site and detailed discussion on submission and appropriate determination routes.

1.5 EIA Considerations for Scottish Ministers

- 1.5.1 EIA development is defined in the EIA Regulations, in respect of an application for under the Act, as Schedule 1 development or Schedule 2 development likely to have significant effects on the environment by virtue of factors such as its nature, size or location.
- 1.5.2 When determining whether a Proposed Development is likely to have significant effects on the environment by virtue of factors such as its nature, size or location, the Scottish Ministers should take account of the criteria in Schedule 3 of the EIA Regulations. The Planning Practice Guidance, although only covering England, provides a useful guide to the key considerations that may determine whether a proposal is EIA development. Further consideration of potential environmental effects is provided below within Section 3.

2. Site and Proposed Development

2.1 Site Location

- 2.1.1 The site boundary of the Proposed Development is located immediately adjacent to Whitelee Windfarm and Extension, predominantly within the local authority area of East Ayrshire. Overall, it encompasses a total area of approximately 1,000+ hectares. Notably however, of this total site area, it is anticipated that only between 40 and 50 hectares would be considered net developable area (i.e. the areas for the solar PV, green hydrogen and BESS developments) as well as a c. 7 km cable route connecting between the proposed green hydrogen production facility and the BESS and the existing Whitelee Windfarm Extension substation (to allow for connection to the grid). For the purposes of the eventual application, it is anticipated that the extent of the overall site boundary would be reduced, following design refinement and discussions with stakeholders.
- 2.1.2 A portion of land (c. 35 hectares) is presently shown within the site which would fall within the East Renfrewshire Council (ERC) boundary. This area of land, located at the north western boundary of the site is presently shown due to its proximity to the Whitelee Windfarm and Extension link road, leading to/from the B764 to the north where it is anticipated that access to/from the Proposed Development will take place – both in terms of construction and in operation. Finalised access proposals have not yet been fully established for the site and if alternative means of access is procured prior to application submission it would be intended that the site boundary in this location would be revised to remove any land within the ERC boundary.
- 2.1.3 The site is located approximately c. 6.8km (4.25 miles) from the nearest settlements of Eaglesham (East Renfrewshire, to north east), c. 7.4km (4.6 miles) from Fenwick (East Ayrshire, to south west), c. 5.8km (3.6 miles) from Waterside (East Ayrshire, to south west) and c. 8km (5 miles) from Moscow (East Ayrshire, to south).
- 2.1.4 The site is located within a highly accessible area adjacent to the B764 which is located to the north of the Proposed Development boundary with access to the strategic motorway network from the M77 within close proximity to the west.
- 2.1.5 The red line site boundary associated with this EIA screening request is included within Appendix A of this document.
- 2.1.6 Due to the nature of the Proposed Development and the location of the various elements within the Site (i.e. the solar PV and green hydrogen energy facility to the north and the BESS to the south), there are varying characteristics between these two areas. For ease of understanding, the following paragraphs refer to 'the northern section' and the 'southern section'.
- 2.1.7 The immediate surroundings of the northern section of the site comprise commercial forestry to the immediate north of the site boundary between the site at the B764, plateau moorland to the south and west which comprises the area of land identified for the site and the Eaglesham Moor area of the existing Whitelee Windfarm and Extension immediately to the east nearby the Lochgoin circuit, Lochgoin reservoir, Lochgoin farmhouse and monument.
- 2.1.8 The immediate surroundings of the southern section of the site at the BESS comprise sections of commercial forestry to the north, west and south interspersed with areas of moorland combined with existing access tracks between the existing wind turbines of the Whitelee Windfarm Extension. To the east is situated the existing Whitelee Windfarm Extension substation (c. 800m). Distant to the northwest of the BESS site is Craigendunton Reservoir (2km).

Site selection

- 2.1.9 SPR's site selection process is designed to identify sites which provide the most financially and technically viable option whilst being the least environmentally impactful and thereby standing the best opportunity to gain consent. SPR has selected this site principally as it allows for the best opportunity to make a meaningful contribution to Scotland's national targets for renewable energy generation and further Whitelee's position as centre for green energy in Scotland.
- 2.1.10 SPR is committed to avoiding the development of renewable energy infrastructure in areas where there would be an unacceptable effect on designated sites and where suitable mitigation cannot be achieved. SPR is also committed to not considering sites that have an unacceptable effect on landscape character or amenity of National Parks and National Scenic Areas, and special consideration is attributed to internationally and nationally important species and habitats in the wider area.
- 2.1.11 The following factors have led to the selection of this site for the Proposed Development:
- Acceptable solar resource during peak months;
 - Good levels of site accessibility and access from the motorway network;
 - The lack of statutory nature conservation designations on the site;
 - The close proximity to potential grid connection points;
 - The relatively sparse population of the surrounding area;
 - A good landscape fit;
 - A good opportunity to extend the green energy infrastructure for which the wider Whitelee Windfarm and Extension is associated with and the ability to provide connection to the windfarm – increasing operating efficiency;
 - Past knowledge of the site gained from the previous Whitelee Windfarm Extension Phase 3 application, including the ability to use previously gathered baseline data to inform design principles; and
 - Designated as an area with potential for Wind Energy Development within the East Ayrshire Local Development Plan 2017 which sets a policy context for renewable/green energy.

2.2 Proposed Development

- 2.2.1 The Proposed Development comprises 3 main components; a c. 35MW solar PV farm, a green hydrogen production facility and a c. 50MW BESS with an associated HV cable linking the BESS with the other elements of the scheme, as well as providing grid connection opportunities. At the screening stage, the detailed design of these elements has not been fully developed beyond core principles and therefore SPR expect an element of refinement of the scheme prior to application submission. This refined scheme will be based on several factors and will involve further pre-application engagement prior to submission. Details of the elements as they are currently envisaged are provided below.

Solar PV farm

- 2.2.2 It is anticipated that the solar PV farm will comprise c. 100,000 solar panel arrays each with heights of less than 3m at the frame's highest point. The scheme will include several centre inverter stations (approximately 10 of), site tracks, HV and LV cabling, perimeter fencing, CCTV cameras, new access

off the B764 (currently considering two points of access) and a substation building (located on the same platform as the proposed hydrogen production facility). It is proposed to locate the solar PV farm within a section of the site located to north west of the site boundary. This area of the site sits south of Kingswell and Tent Knowe and east of Cauldstanes at Collory Bog and extends to approximately 45 – 50 hectares. This area of the site offers the benefit of being able to locate the solar PV arrays in such a way whereby they will be integrated into the landscape and due to its topography, it is possible to orientate the panels to the south with minimal regrading of the land or changes to its natural topography.

2.2.3 The solar PV farm is centred on grid reference NS 50955 47366.

Green hydrogen production facility

2.2.4 The green hydrogen production facility is proposed within the site, embedded within the solar PV scheme and shares a platform (of stone construction) with the substation building for the solar PV scheme. It is proposed that the green hydrogen production facility element will be accessed via the solar PV schemes proposed access tracks, which also tie into the existing Whitelee Windfarm and Extension link road to the west which leads directly to a vehicular junction at the B764. This area of the site extends to approximately 0.8 hectares, based on a present site platform of c. 70m x 120m (less 875 sq. m temporary construction compound). At present, the layout of the green hydrogen production facility has yet to be finalised, however based on its initial layout the facility could consist of multiple buildings with an anticipated 4 No. vertical standing pressure vessels up to 15m in height.

2.2.5 While relatively compact in footprint, the green hydrogen production facility will include the following infrastructure:

- A hydrogen electrolyser facility;
- A hydrogen purification unit;
- A site office;
- 4 No. transformers;
- Infrastructure associated with water supply;
- Various H2 and O2 processing plant, including a separator vessel at a maximum height of 15m;
- 4 No. H2 vertical standing pressure (storage) vessels, with a maximum height of 15m
- 2 No. cooling facilities between 9 and 12m in height;
- A gatehouse;
- Internal access roads;
- 4 No. filling bay valves on 1 pipework skid (for H2 filling of tube trailers on-site for export off-site) totalling c. 25% of green hydrogen facility net site area;
- Foundations and hardstanding; and
- Perimeter security fencing.

2.2.6 The green hydrogen production facility operates based on Polymer Electrolyte Membrane Electrolysis technology with a predicted capacity for supply up to 10,000kg of green hydrogen per day based on a 20MW power demand (note power demand increases over time as system efficiency degrades). The anticipated water demand for the facility is up to c. 120,000 litres per day and is anticipated to be supplied by mains water supply.

Battery storage and associated HV cable

- 2.2.7 The BESS (Battery Energy Storage System) utilises existing Lithium-Ion battery technology
- 2.2.8 The BESS comprises a single building measuring approximately 70m x 62.5m.
- 2.2.9 It is proposed that the BESS compound would be situated at the location of the former construction compound for the Whitelee Windfarm Extension on a platform which extends to c. 0.78 hectares (100m x 77.5m footprint) and would be located within a section of the site to the south of the solar PV and green hydrogen production elements. This area of land is located at Rough Hill approx. 2km south west of Craigmendunton Reservoir. The site is c. 800m west of the Whitelee Windfarm Extension substation where it will connect via buried HV cables.
- 2.2.10 The BESS is centred on grid reference NS 54619 44999.
- 2.2.11 In addition, it is anticipated that the cable route will run to/from the Whitelee Windfarm Extension substation and the solar PV and green hydrogen production facility over a span of c. 7.4km. While this element will be further refined prior to submission of the application, it is anticipated that a degree of micrositing allowance will be necessary to allow for suitability for construction across the cable's span.

Construction compounds and laydown areas

- 2.2.12 It is anticipated that the project will require 3 main temporary construction compounds with one construction compound corresponding to each of the 3 main elements (solar PV, hydrogen and BESS).
- 2.2.13 In addition to these 3 main temporary construction compounds, there will be several minor laydown areas located throughout the scheme, which will be used in a temporary capacity for the duration of construction. The location of these areas is yet to be confirmed.
- 2.2.14 Between the 3 main temporary construction compounds and laydown areas, it is anticipated that c. 6,000 sq. m of land will be required in total.
- 2.2.15 These compounds would be temporary for the duration of the construction activities at the site and would be removed and the site restored following completion of construction operations.

3. Principal Site Characteristics

3.1 Overview

- 3.1.1 To assist the ECU in making a formal screening determination, this request provides a brief description of the nature and extent of the Proposed Development, and of its potential environmental impacts with cognisance of the environmental baseline of the site and its characteristics.
- 3.1.2 Whilst this report focuses on the potential for environmental impact that may arise from the Proposed Development at this site, it also seeks to consider the potential for cumulative impact that may arise in combination with other developments within the wider locale.

3.2 Biodiversity, Flora and Fauna

Baseline

Statutory and non-statutory designated sites

- 3.2.1 No nationally important sites of nature conservation value are located within or near the Proposed Development. The nearest site, Brother Loch and Little Loch Site of Special Scientific Interest (SSSI) is located approximately 3.8km to the north of the site, which is notified for open water basin-fens with a high diversity of wetland communities and small populations of wintering bird species. Three non-statutory designated sites are located within 1km of the site:
- Fenwick Moor (Greenfield Burn) Provisional Wildlife Site is located within the eastern extent of the site;
 - Craighendunton Reservoir Provisional Wildlife Site is located approximately 350m from the site; and
 - Lochgoin Reservoir and Dunwan Dam Site of Importance for Nature Conservation (SINC), is located approximately 1,300m from the site.

Priority habitats and GWDTEs

- 3.2.1 A large proportion of the Proposed Development comprises wet modified bog, coniferous plantation woodland, and areas of improved, semi improved and marshy grassland.
- 3.2.2 Recent surveys indicate that the blanket mire (wet modified bog) resource within the site has been adversely impacted by the effects of commercial forestry plantation, grazing pressure and drainage. The southern section of the Proposed Development area comprises former coniferous plantation woodland, which was clear-felled in 2008 and has since been subject to phased restoration.
- 3.2.3 Within the Proposed Development site, the following NVC communities have the potential to be groundwater dependent terrestrial ecosystems (GWDTEs) which could have a high or moderate dependence upon groundwater:
- M6c (*Carex echinata-Sphagnum recurvum/auriculatum mire, Juncus effusus sub-community*);
 - M23a (*Juncus effusus/acutiflorus-Galium palustre rush-pasture, Juncus acutiflorus sub-community*); and

- M25 (*Molinia caerulea-Potentilla erecta mire*).

Protected and Priority species

3.2.4 The following protected and priority species have been identified as present:

- Otter activity has been recorded along Drumtree Water and Dunton Water including the presence of covered and uncovered temporary resting sites;
- Bird species of high conservation importance (hen harrier, merlin, peregrine, short-eared owl, barn owl and golden plover) are present in the wider area but based on previous surveys do not appear to use the site for breeding. Small numbers of black grouse are present in the wider vicinity, with two historic leks approximately 900m and 1,300m from the Proposed Development; and
- No migratory salmonids (sea trout or Atlantic salmon) are known to be present in the five minor watercourses that are located within the footprint of the Proposed Development; however, brown trout (non-migratory salmonids) are likely to be present in all of them.

3.2.5 No evidence of badger or water vole has been recorded either historically or during recent surveys; and no potential bat roosts (in buildings or trees) have been identified within 100m of the Proposed Development.

Potential for Significant Environmental Impacts

3.2.6 Of the habitats present, wet modified bog (blanket mire) has the highest potential nature conservation importance as it is listed on Annex 1 of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive). The installation and operation of solar photovoltaic modules and siting of the hydrogen compound and proposed cable route may have both direct and indirect impacts on degraded 'wet modified' bog. The site layout will therefore be designed to ensure that developable areas including associated cable route proposed within less degraded habitats is minimised. Areas of deeper peat and good condition blanket mire will be avoided wherever possible, and electrical infrastructure cabling will be installed alongside tracks wherever possible to reduce the footprint of the Proposed Development. On this basis, there is not anticipated to be any significant adverse effects from the Proposed Development on Annex 1 habitats.

3.2.7 There is also potential that without suitable mitigation, construction works may temporarily disturb groundwater flow. As such, the presence of potential GWDEs will inform site design and potential impacts will be managed through the adoption of standard good practice and environmental management techniques in order to maintain hydrological connectivity.

3.2.8 Potential impacts to protected and/or priority species notably otter and black grouse will be avoided through implementation of pre-construction surveys and adherence to best practice during construction.

3.2.9 Subject to best practice and through suitable mitigation it is not deemed that there would be a significant adverse environmental effect arise from the Proposed Development in respect on its impact on habitats, flora and fauna.

3.3 Landscape and Visual Impact

3.3.1 A Landscape and Visual Assessment (LVA) will support the application to allow for suitable assessment of the Proposed Development in respect of the surrounding landscapes and visual

receptors, as well as the identification of appropriate mitigation. The purpose of the LVA is to identify, predict and evaluate these potential effects in accordance with best practice guidance, including, but not limited to, the following:

- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition. Landscape Institute and IEMA, May 2013;
- Planning Guidance for the development of Large-Scale Ground Mounted Solar PV Systems. Building Research Establishment, 2014;
- Visual Representation of Development Proposals, TGN 06/19. Landscape Institute, March 2019; and
- Residential Visual Amenity Assessment. TGN 2/19, Landscape Institute March 2019.

ZTV Study Area

- 3.3.2 The first step in the LVA is the establishment of the study area, which covers the within which the Proposed Development may have a significant effect upon the landscape and visual resource. It is accepted practice within LVA work that the extent of the study area for a Proposed Development is broadly defined by the visual envelope of the site and the anticipated extent of the ZTV arising from the development itself. In this case, it is considered that a study area of 5km (with a detailed study area of 2km) is considered appropriate to allow for accurate assessment of all potentially material landscape and visual effects; based on the local landscape character, the scale of construction and the scale of the Proposed Development.
- 3.3.3 The study area is not intended to provide a boundary beyond which the Proposed Development will not be seen, but rather to define the area within which to assess potential effects. Notably, significant landscape and visual effects are more likely to include effects on close proximity views as well as the change in character of the site itself and in the area in close proximity to it.
- 3.3.4 Appendix B of this report includes a copy of a ZTV which has been prepared to consider the potential impacts of the three elements on the following viewpoint locations:
- A77/B764 Junction;
 - Drumtree;
 - Lochgoin Monument;
 - A77, South Drumboy;
 - B763, Queenseat Hill;
 - A77, Laignmuir; and
 - Clunch Road.
- 3.3.5 The landscape in this area has been modified by windfarms, including most notably, the operational Whitelee Windfarm and Extension. Whitelee Windfarm and Extension contributes strongly to the baseline landscape character and is located immediately adjacent to the Proposed Development with the solar PV and green hydrogen elements immediately west and the BESS element to the south west.
- 3.3.6 Previously, under the appeal for the Whitelee Windfarm Extension Phase 3 application, the Reporter concluded that the Proposed Development would have an unacceptable and substantial adverse impact on landscape and visual effects. This proposal, which sought to extend the influence of the

windfarm by providing an additional five turbines with a maximum blade tip height of 111m was therefore subsequently dismissed at appeal on these grounds.

- 3.3.7 Notably, by comparison to the previous Whitelee Windfarm Extension Phase 3 proposals, the Proposed Development does not extend the influence of turbines within the landscape, and while there would result in additional infrastructure introduced within the landscape – most notably the potential for 4 No. vertical standing pressure vessels of each up to 15m in height, the effect on the landscape character would not be deemed to be significant within the context of the EIA Regulations. Additionally, there will be no predicted significant effects on the landscape character of designated landscapes.
- 3.3.8 The green hydrogen facility also has the potential to release excess water vapour into the atmosphere which can be visible in limited circumstances (i.e. where the air is cold enough to condense the hot vapour). The resulting effect of this, while visible, would be non-permanent and irregular and would not significantly impact landscape and visual receptors.
- 3.3.9 Furthermore, in respect of the BESS element, it is the findings of the ZTV that this can be removed from the scope of LVA due to its location within surrounding areas of forestry as well as the lack of visual receptors in this location.

3.4 Geology, Hydrology and Hydrogeology

- 3.4.1 The Proposed Development is located in the upper reaches of the Kilmarnock Water catchment. Much of the site has areas of peat, underlain by glacial till, and locally, by alluvial and sand and gravel deposits. The solid geology beneath the site is mainly carboniferous basalt.
- 3.4.2 There are a number of watercourses within 2km of the site – Euchan Water, Mid Grain and Rye Grain and a number of small burns. There are five watercourse crossings anticipated (from north to south):
- 3.4.3 Five watercourse crossings are anticipated (from north to south):
- Unnamed tributary upstream of Drumtree Water;
 - Bught Burn;
 - Howe Burn;
 - Pochweer Burn; and
 - Dunton Water.
- 3.4.4 There are no public or private water supplies within 2km.
- 3.4.5 Within 2km of the site are the Lochgoin and Craigendunton reservoirs. It is not presently anticipated that water supply would be sought from either reservoir, nor that the proposals would have any direct or indirect impact on the reservoirs.
- 3.4.6 It is anticipated that there would be limited construction works associated with the Proposed Development related to some potential minor works on culverts and improvements to peat habitats and therefore resulting in a limited risk of pollution to watercourses. Those areas where construction works have the potential to impact on watercourses, namely the five watercourse crossings outlined above – and associated with the proposed HV cable route – are assessed as not presenting significant risk to the watercourse and any minor impacts can be appropriately managed through suitable mitigation and the following of best practice guidance.

- 3.4.7 Access tracks can increase the rate of surface water run-off in local catchment areas. It is anticipated that the Proposed Development would include minor measures to mitigate surface water run off during rainfall events.
- 3.4.8 The majority of the site is not identified by SEPA on its Flood Risk Mapping as being at medium to high risk of flooding, from either rivers or surface water and none from coastal waters. However, while this is the case, the SEPA mapping does indicate that there may be areas susceptible to localised flooding from both river or surface water sources. These areas are predominantly contained within close proximity of watercourses and the reservoirs and do not extend to extensive areas of the site.
- 3.4.9 Accordingly, it is not anticipated that the Proposed Development would be at significant risk of flooding subject to mitigation measures which would be included within the drainage strategy for the site to reduce the potential for exacerbation of possible flood risk in the area.
- 3.4.10 However, to alleviate any concerns in this regard, a Flood Risk Statement can be prepared in support of the application should the ECU, in consultation with SEPA, if deemed necessary.
- 3.4.11 On this basis, there is not anticipated to be any significant effects from the Proposed Development on geology, hydrology or hydrogeology.
- 3.4.12 Whilst it is not considered that the Proposed Development would have any significant effect on hydrology or water resources, it is suggested that further technical assessment on flood risk and drainage would be undertaken as part of the future application on the site and that these assessments would recommend any necessary mitigation measures to minimise potential non-significant impacts.

3.5 Transport and Access

- 3.5.1 The proposed development site is located to the south of Glasgow and south of the B764 Eaglesham Road.
- 3.5.2 The M77 motorway is a regional route linking Ayrshire in the southwest, with Glasgow and the central belt urban conurbation. This motorway was opened to traffic in 2005 and is constructed to full motorway standards with two lanes in each direction, hard shoulders, central reservation and central barriers. The motorway alignment complies with full motorway standards and has a 70 mph speed limit.
- 3.5.3 The M77 motorway Junction 6 at Kingswell has restricted access provisions with the following movements not being incorporated:
- No off ramp for northbound traffic on the M77; and
 - No on ramp for southbound traffic on the A77.
- 3.5.4 The former trunk road A77 between Newton Mearns and Ayr was downgraded to the A77 general purpose road following completion of the M77 motorway between Newton Mearns and the north of Kilmarnock. The road provides a local traffic route for non-motorway traffic with a typical speed limit of 60 mph. The route varies in carriageway width between East Renfrewshire, which has introduced cycle lanes, and East Ayrshire. The road carriageway width in East Ayrshire and East Renfrewshire is typically 7.3 m wide.
- 3.5.5 In addition, the opening of the A726 Glasgow Southern Orbital Road between Newton Mearns and East Kilbride has allowed the downgrading of the B764 Eaglesham Road to be carried out. Typically, the speed limit of the B764 is 60 mph. East Ayrshire has retained the original road width of 7.3 m

whilst East Renfrewshire has introduced road narrowing to a single lane of 3.3 m width, with passing places.

- 3.5.6 Access to the site may be taken via the existing Whitelee Windfarm and Extension link road to the east of the proposed green hydrogen production facility. The link road runs south from the B764 and has 2 lanes, it is designated as a private road with local and private access only and features a security barrier approximately 600m south of its junction with the B764.
- 3.5.7 Alternative/additional access points are currently being considered which would provide direct access to/from the site and the B764 at Kingswell to the north west of the solar PV element.
- 3.5.8 Proposed access tracks internal to the site, would have limited use for very specific purposes and would not form part of the highway network.
- 3.5.9 Additional temporary tracks and/or accesses necessary for the undertaking of construction works would be removed and the site restored.
- 3.5.10 It is not predicted that there would be any significant adverse effects from the Proposed Development on traffic or transport.
- 3.5.11 Due to the site's existing connectivity to infrastructure and the close proximity of access to the national motorway network, serving both the immediate area and further afield, it is not considered that the Proposed Development would be likely to result in significant environmental impact in relation to issues of transport in the wider locality.
- 3.5.12 However, given the scale of the Proposed Development, and in order to alleviate any concerns in this regard, a traffic and transportation statement will be included within the application documents. This will be informed by the project's overall access strategy and will set out anticipated construction traffic levels, operational vehicle movements and provide proposed traffic management measures if necessary.

3.6 Other Characteristics

Emissions

- 3.6.1 Operation of the electrolyser requires input electricity and water. The outputs from the process are Hydrogen (H₂) and Oxygen (O₂) gases. Where electricity is derived from renewable energy, the production of H₂ is a zero-carbon footprint process. On this basis, there are no adverse emissions to air or land resulting from the operation of the green hydrogen production facility. In the case of water there will be flow through of water due to the ultra-high purity required for the input water. No chemicals or additives are introduced to the water, so there will be no adverse impact on local water quality. Suitable drainage systems will be implemented to manage this water, the details of which will be included within the future application.
- 3.6.2 Due to the heat applied to the water during the electrolysis process – necessary to split the H₂ and O₂ – water vapour is produced in limited amounts alongside the release of unused O₂. In cold atmospheric conditions, as the water vapour is released it may condense in the atmosphere creating localised plumes, however as no additional chemical reactions occur due to the nature of the electrolysis process, this water vapour is clean and presents no detrimental impact on air quality.

Noise and Vibration

- 3.6.3 The Proposed Development is not considered to present a significant impact arising from noise and vibration and specifically the elements comprising the solar PV farm and the HV cable is not predicted to create any additional noise impacts.
- 3.6.4 Hydrogen production and battery storage facilities of the type proposed do not generate significant noise during their operation. However, data from suppliers of key components (electrolysers, compressors, storage vessels) will be assessed for their noise impact as part of the planning application and mitigation will be proposed if necessary.
- 3.6.5 Further key mitigation associated with noise and vibration would be provided due to the distances from receptors. In this instance, the proposed location of the green hydrogen production facility will be kept at least 500m from the nearest residential receptor. In respect of the BESS, it would be approximately 2.25km distant from the nearest residential receptor and approximately 2.2km distant from the nearest non-residential receptor.

Historic Environment

- 3.6.6 The Proposed Development is located in an area with several cultural heritage features (referred to as 'assets') of local or less than local importance, most of which are associated with historical farming use. Within a wider 10 km study area there are a range of cultural heritage assets of regional or national importance, such as Category A or B listed buildings.
- 3.6.7 There is one designated heritage asset within 2km of the Proposed Development, which is Lochgoyn (nee Lochgoin) Monument, a Cat B listed building. The monument is an obelisk in memory of Scots author John Howie (ref LB12509)⁴ which is located at Lochgoin farm to the south of the western site boundary at the green hydrogen production facility (NGR, NS 52824 46950) and is considered to be of regional importance.
- 3.6.8 Beyond the 2km study zone, there is one designated heritage asset; Dunwan Hill Fort (ref SM12882)⁵ which is located c. 3.1km west (NGR, NS 54689 48952) and is listed as a Scheduled Ancient Monument.
- 3.6.9 There are several non-designated heritage assets located within 500m of the Proposed Development, with the closest being a cairn within the site boundary in the area for the HV cable route at Craigendunton Reservoir. These assets are considered to be of low to negligible sensitivity and of local or less than local importance and are principally located in areas of the site along the cable route where it is not anticipated that there would be any significant permanent changes which would significantly affect these assets.
- 3.6.10 Of the non-designated heritage assets, nine are identified as being historic landscape types. Of these historic landscapes they are primarily typified as being associated with agriculture and include moorland and rough grazing land, coniferous plantation, fields and rough grazing land. All landscape types are considered to be of local or less than local levels of importance.
- 3.6.11 The construction of the Proposed Development has the potential to adversely affect unknown (i.e. previously unrecorded) archaeological sites. Although such effects can be permanent and irreversible they nonetheless can be mitigated by an archaeological watching brief during construction, recording and publication. This would be agreed with the archaeological advisors to the local authority, West of Scotland Archaeology Service (WoSAS).

⁴ <https://portal.historicenvironment.scot/designation/LB12509>

⁵ <https://portal.historicenvironment.scot/designation/SM12882>

- 3.6.12 Given the distance from the nearest designated heritage assets and their sensitivity, there is not anticipated to be any significant effects from the Proposed Development on the historic environment and where there may be disturbance arising from construction work it is considered that this can be suitably mitigated to minimise any effects.
- 3.6.13 It should also be noted that within the Environmental Statement supporting the Whitelee Windfarm Extension Phase 3, detailed consideration of the historic character of the site and its surroundings was undertaken and that subject to proposed mitigation measures being put in place, residual effects on cultural assets would have been of Negligible or Minor significance and not considered to be significant within the context of the EIA Regulations. SPR considers that this revised scheme on the site will not give rise to any additional significant effects which were predicted from the Whitelee Windfarm Extension Phase 3 which would warrant further re-assessment of the cultural asset base.

Health and Major Accidents and Disasters

- 3.6.14 The pathways for possible reductions in human health are linked to land quality, noise and vibration, air and water quality and climate change. There are no significant risks to human health identified in the context of the operation of the Proposed Development across its different components.
- 3.6.15 The sections above demonstrate that, given the nature of the Proposed Development, its location, and the proposed mitigation measures, significant effects are not predicted for any of these topics, and therefore no significant adverse effects on human health are anticipated.
- 3.6.16 The location of the Proposed Development is not in a location which is susceptible to natural disasters or extreme weather. Therefore, there is not considered to be any significant risks for major accidents or disasters to occur.
- 3.6.17 The Proposed Development will be constructed and operated in accordance with relevant health and safety legislation including the Health and Safety at Work Act 1974 and the Control of Major Accident Hazard Regulations 2015 (COMAH). All site-based construction activities will be conducted in accordance with the Construction (Design and Management) Regulations 2015 (CDM 2015).

Resources and Socio-Economics

- 3.6.18 During construction 3 temporary construction compounds and several equipment laydown areas totalling c. 6,000 sq. m (0.6 hectares) will be required. The residual effects of this change in the land use during construction would be of low significance.
- 3.6.19 During the operational phase of the development, most of the site will be returned to be used for grazing land with no effects predicted. Those areas which are required for the operational elements of the solar PV farm, the green hydrogen production facility and the BESS would result in a permanent change of the land use, but not to a degree where it would be deemed significant within the context of the EIA Regulations.
- 3.6.20 The construction of the Proposed Development would result in beneficial effects for on-site employment, particularly regarding the green hydrogen production facility, and would provide a wider service benefit to the local and wider economy in terms of offering efficient green energy, particularly with regard to green hydrogen production. It is anticipated that both short-term construction jobs and long-term operational jobs would be created because of the Proposed Development, with the long-term jobs primarily centred around the green hydrogen production facility. In addition, it is likely that further indirect economic benefits will occur within the supply chain.

3.6.21 It is anticipated that there would be negligible adverse effects during construction in relation to informal recreation and access, which would be classed as temporary and not significant and that there would not be any increased benefits to informal recreation and access resulting from the Proposed Development post-construction.

3.6.22 It is considered that the effects on resources and socio-economics resulting from the Proposed Development are largely positive with no residual effects on land-use, socio-economics or recreation which could be considered significant within the context of the EIA Regulations.

Climate Change

3.6.23 No works are envisaged that would result in significant release of greenhouse gases, with notably the outputs from the green hydrogen development being water and oxygen. Changing climate conditions would not impact on the Proposed Development. No significant climate change effects are therefore anticipated.

3.6.24 The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019⁶, amends the Climate Change (Scotland) Act 2009⁷ and sets targets for the reduction of greenhouse gas emissions in-line with the objectives of the Paris Agreement. The opportunity to introduce renewable and green energy technologies as part of the Proposed Development provides both direct and indirect benefits which can contribute to the Scottish Government's aims towards decarbonisation by 2045 and can positively contribute to the national agenda on climate change.

Waste

3.6.25 There project will necessitate construction work in respect of its three main elements, as well as the those associated with the HV cable. Primarily it is anticipated that there will be no significant impacts arising from construction which cannot be suitably. The construction is unlikely to generate significant quantities of waste materials, such as excavated arisings which would necessitate transport off-site. Those quantities which may be produced are unlikely to be at a level which would significant affect the capacity of off-site waste management facilities.

Other

Telecommunications

3.6.26 A number of other issues associated with the Proposed Development have also been considered in respect of the EIA Regulations, including potential effects on telecommunications and television signals, glint and glare from the solar PV farm and air quality.

3.6.27 No significant disruption to telecommunications and television reception is anticipated as a result of the Proposed Development due to the low scale of the proposed infrastructure on site.

Glint and Glare

3.6.28 Potential solar reflections can arise from proposed solar PV schemes which have the potential to affect receptors including aviation, nearby dwellings and road users.

⁶ <https://www.legislation.gov.uk/asp/2019/15/enacted>

⁷ <https://www.legislation.gov.uk/asp/2009/12/contents>

- 3.6.29 In respect of aviation, Glasgow International Airport is located approximately 20km north and Glasgow Prestwick Airport is located approximately 25km south west of the proposed solar PV location.
- 3.6.30 In the assessment of potential impact on dwellings arising from glint and glare, it is accepted practice to consider dwellings which are within or close to 1km of the proposed development, or that are in view of the PV panels. There are 6 properties which are within this radius, or may have visibility of the panels, of which 5 are occupied and 1 is unoccupied. Of these 5 properties 3 are located to the north and east and 2 are located to the west.
- 3.6.31 The accepted practice to consider impact on road users is as per that of dwellings. Within 1km or in view of the PV panels are sections of the B764 and M77 to the north and west and the Whitelee Windfarm and Extension link road and an unnamed access road to the east. Notably, the link road and the unnamed road to the east are both private access roads with signage indicating no public access.
- 3.6.32 Due to the proximity of receptors to the site and the lack southern receptors within nearby distances across the categories, and due to the natural topography of the selected solar PV location it is considered that the potential for impact is not significant within the context of the EIA regulations. At present, it is assumed that the finalised solar PV scheme will be supported by a glint and glare study, which will provide full consideration of all receptors and will provide detailed mitigation considered suitable to address identified non-significant impacts.

Air Quality

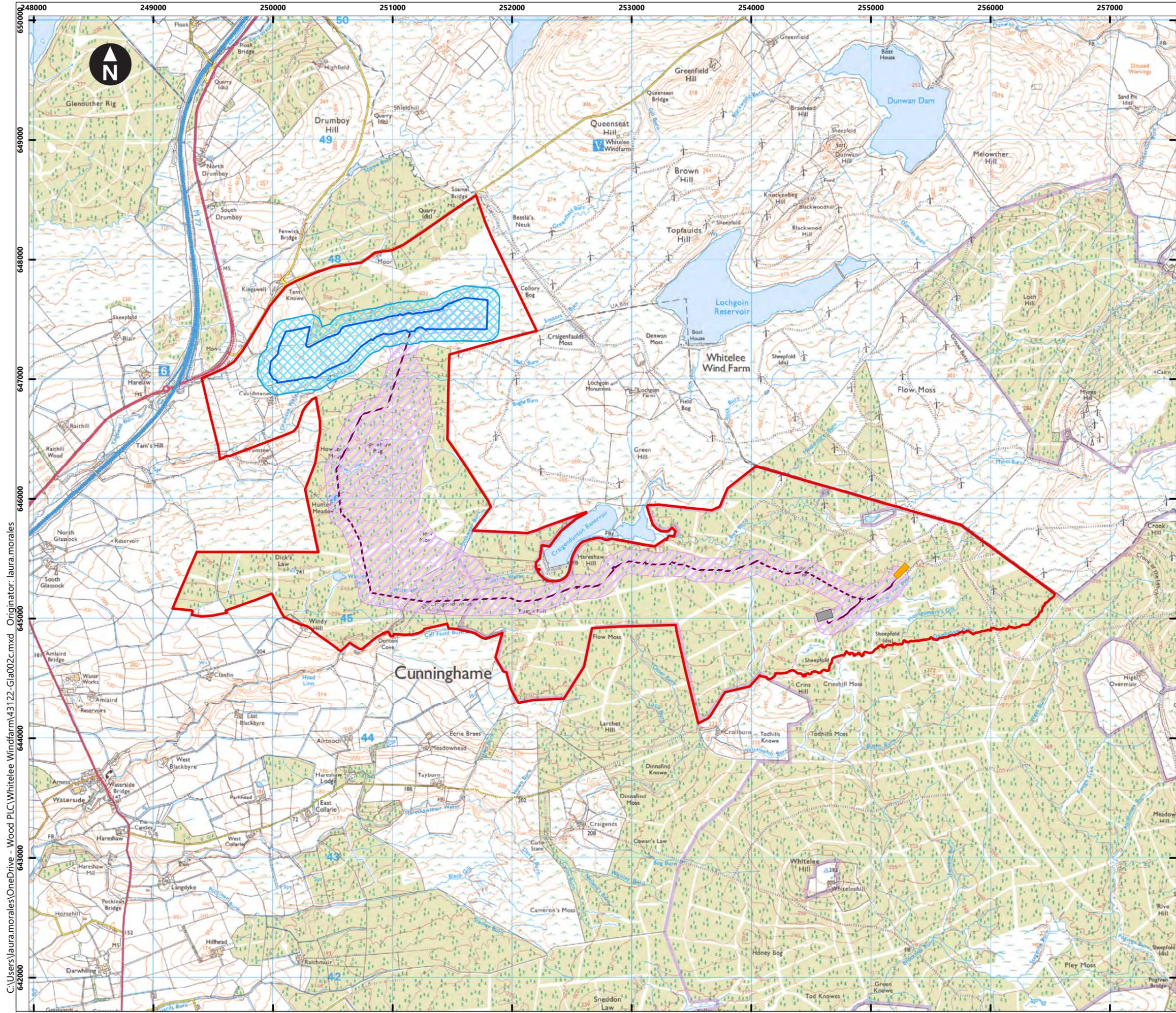
- 3.6.33 The potential for adverse effects on local air quality during construction is considered to be minor, temporary and not significant. During operation, the Proposed Development will provide a beneficial effect on local and global air quality, by avoiding emissions which would otherwise be achieved by other technologies by the burning fossil fuels.
- 3.6.34 Furthermore, in respect of the green hydrogen facility, the electrolysis process splits water by electrical energy to obtain hydrogen plus oxygen. As the hydrogen is stored and transported off-site, the primary outputs are oxygen and water with the oxygen output serving to improve local air quality. Further indirect benefits to air quality resulting from the green hydrogen development are centred on the increased availability of green hydrogen within the wider locality, which in turn can result in reduced reliance on fossil fuels. This will positively contribute to meeting Scotland's national targets for reducing greenhouse gas emissions.

4. Summary and Conclusion

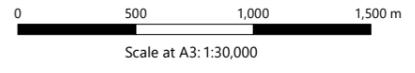
- 4.1.1 Due to the scale and nature of the Proposed Development, the characteristics of the site and the period within which the development is proposed to be delivered, it is not anticipated that significant environmental effects will result, either of itself or cumulatively, which cannot be sufficiently addressed through the implementation of various mitigation measures.
- 4.1.2 None of the temporary impacts during the construction phase are considered to be significant or to have the potential to become significant so long as appropriate mitigation measures are put in place in compliance with current industry standards and best practice. In this respect, the Applicant can draw upon a wealth of experience and a long track record of delivering similar types of renewable infrastructure on sites sharing common characteristics to those of the site throughout Scotland and the UK.
- 4.1.3 Upon completion of the construction phase, it is not considered that the future use of the site for renewable development and green technologies would result in a significant detrimental impact on the environment.
- 4.1.4 Overall it is our position that the likely environmental impacts arising from the Proposed Development would not be significant when considered against the assessment criteria contained within Schedule 3 of the EIA Regulations.
- 4.1.5 It is therefore our view that the Proposed Development would not require EIA for the following reasons:
- The Proposed Development is not considered to be a project which would fall within the criteria defined by Schedule 1 of the EIA Regulations, for which EIA is mandatory; and
 - The Proposed Development may be considered to constitute a project as defined in Schedule 2 of the EIA Regulations but is unlikely to result in significant environmental impact.
- 4.1.6 We therefore respectfully request that the ECU review this Screening request within the statutory 21-day period and, assuming that it is in agreement with the findings of its assessments contained therein, issue a formal screening opinion confirming the view that no EIA would be required to support the Proposed Development.
- 4.1.7 In addition, and in respect of the scope of information to be provided alongside the planning application, we contend that topics relating to cultural heritage, air quality, glint and glare, noise and socio-economics, public access and recreation can be scoped out from further assessment based on the information provided above within Section 3 of this report and would request confirmation from the ECU as to their agreement with this approach.

Appendix A

Indicative Site Location Plan



- Key
- Site Boundary
 - Proposed Cable Route (indicative)
 - Solar Search Area
 - Indicative Solar and H2 Search Area
 - Cable Route Buffer
 - Proposed BESS Compound
 - Whitelee Extension As Built Substation



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Whitelee Windfarm Extension – Solar PV, Green Hydrogen Production and Battery Storage Facilities
Request for Screening Opinion

Figure 1.1
Site Location Plan

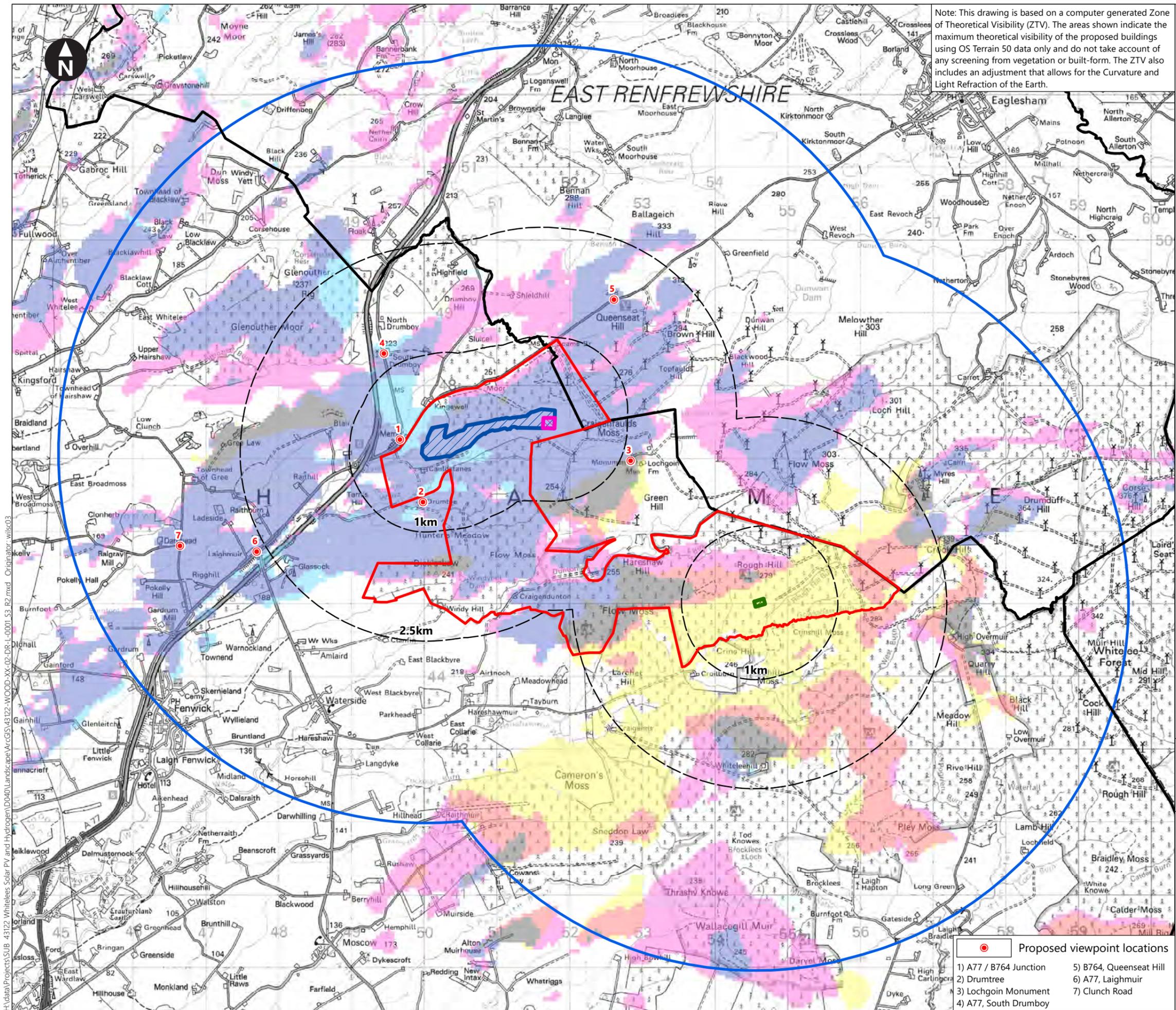
October 2020



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Appendix B

Zone of Theoretical Visibility



Note: This drawing is based on a computer generated Zone of Theoretical Visibility (ZTV). The areas shown indicate the maximum theoretical visibility of the proposed buildings using OS Terrain 50 data only and do not take account of any screening from vegetation or built-form. The ZTV also includes an adjustment that allows for the Curvature and Light Refraction of the Earth.

- Key
- Proposed Red Line Boundary
 - Solar Search Area
 - H2 Compound
 - Proposed BESS Compound
 - Landscape and Visual Study Area (5km)
 - Local authority boundaries
 - Lines indicating the distance from the proposed buildings
 - Maximum theoretical visibility of Solar Search Area
 - Maximum theoretical visibility of H2 Compound
 - Maximum theoretical visibility of Proposed BESS Compound
 - Combined maximum theoretical visibility of Solar Search Area and H2 Compound
 - Combined maximum theoretical visibility of Solar Search Area and Proposed BESS Compound
 - Combined maximum theoretical visibility of H2 Compound and Proposed BESS Compound
 - Combined maximum theoretical visibility of Solar Search Area, H2 Compound and Proposed BESS Compound

Notes:
 This figure has been based on the following parameters:
 Solar Panels
 Turbine layout file: LWWhiteleeH2001.WFL
 Height: 3m
 Hydrogen Plant
 Turbine layout file: LWWhiteleeH2002.WFL
 Height: 20m
 Battery Storage Compound
 Turbine layout file: LWWhiteleeH2003.WFL
 Height: 6.8m

0 0.5 1 1.5 2 2.5 3km
 Scale at A3: 1:50,000

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Whitelee Solar

Zone of Theoretical Visibility with Proposed LVA Viewpoints

- Proposed viewpoint locations
- 1) A77 / B764 Junction
 - 2) Drumtree
 - 3) Lochgoin Monument
 - 4) A77, South Drumboy
 - 5) B764, Queenseat Hill
 - 6) A77, Lighmuir
 - 7) Clunch Road

wood.

