3.21

IMPACT ON COMMUNITIES (INCLUDING NOISE AND SHADOW FLICKER)		
Nature of impact	**Scale of potential impacts from applicable proposals**	
Shadow Flicker Wind turbines can cause specific issues with shadow flicker. Shadow flicker is an effect that can occur when the shadow of a blade passes over a small opening (such as window), briefly reducing the intensity of light within the room, and causing a flickering to be perceived. Shadow flicker effects can only occur inside buildings where the blade casts a shadow across an entire window opening. **Noise** Energy development can cause issues with noise. This could either be from operation of the scheme itself or during the construction stage. This would depend on distance of the proposal from residential properties and communities. As well as protecting settlements and communities from adverse visual impact associated with wind energy development, the settlement buffer zones will also provide a degree of separation to reduce impacts from noise and shadow flicker. In terms of the implications of single/small clusters of turbines, it is industry best practice to ensure that a minimum separation distance of at least 10 x rotor diameter from a dwelling house, work place or community facility to a turbine is achieved in order to avoid shadow flicker, and also to mitigate noise impacts. The exact separation distance required will be partly dependent on prevailing climatic conditions, topography and tree cover. For a commercial-scale turbine, this could be around 500m+ from an individual dwellinghouse. For all proposals, the developer will be required to demonstrate that impacts, in particular noise, are acceptable. This constraint has not been mapped, spatially. Issues can normally be resolved between the developer and the relevant operators, and new technology and mitigation methods are constantly emerging. Developers should liaise with OFCOM and any authorities or bodies likely to have an interest as part of the planning process, in particular, the local emergency services. **Community Benefit** The Scottish Government produced Good Practice Principles for Community Benefits from Onshore Renewable Energy Developments to set out a benchmark for delivering community benefit. This document was drawn from engagement with the industry and sets out how developers are expected to deliver community benefit. Whilst this is intended primarily for onshore wind, the principles of good practice could be applied to other technologies. Community benefits associated with renewable energy are delivered entirely outwith the planning system. Developers are however, expected to engage with local communities to explore options in which community benefit can be delivered as part of wind energy developments. Scottish Government recommends a community benefit package for onshore wind developments with a value to the equivalent of at least £5,000 per installed megawatt per annum, index-linked for the operational lifetime of the project. Other onshore technologies should aspire to this level. Additionally, Scottish Government would like to see opportunities for increased levels of community investment explored.	**Wind**	Noise and shadow flicker are further effects of wind farm development which can impact on communities. There are also potential effects such as disruption and dispersion of industrial plumes in industrial locations such as Grangemouth which are emerging issues, with very little background data and information available at present.
	Hydro	• Visual Impact: likely to be relatively localised, but sites may be visible from paths and roads. • Noise: This could either be from the scheme itself or during the construction stage. This would depend on distance from residential properties and communities. • Safety Issues: The site including individual components of the hydro scheme should be considered in terms of public safety, particularly during the construction stage.
	Heat Pumps (air, ground and water source)	Unlikely to be significant impacts given likely location of infrastructure.
	Deep Geothermal	Potential impacts from noise or vibration, depending on location.
	Solar/and Photovoltaics	Depending in the siting and design of solar development, there could be potential issues with glint and glare, as well as public safety.
	Biomass	Impacts on communities are likely to relate to: • Air quality and pollution; • Potential noise; • Transport and impacts relating to delivery of biomass stock. Commercial biomass developments tend to be located within the urban area so it is important that impacts on communities are carefully considered as part of an EIA.
	Energy from Waste	Visual impact may arise from stacks and other development. As with biomass, impacts on communities are likely to relate to: • Air quality and pollution; • Potential noise; • Transport and impacts relating to delivery and processing of waste.
	Energy Recovery	Dependent on scale and location of development.
	Energy Storage	Dependent on scale and location of development. Security, lighting and public access restrictions should be detailed.
	Combined Heat and Power and Decentralised Energy Networks	Impacts from CHP and heat networks will be dependent on scale and location of proposal. Installation of heat network infrastructure may cause noise and disruption to communities.

IMPACT ON COMMUNITIES (INCLUDING NOISE AND SHADOW FLICKER)
Development Plan Policy
IR12 Energy Generation Development
Supporting Information Required
Safety Issues: Details should be provided as part of the application in relation to security on site, both temporary and permanent, as well as the location of signage and scale and type of fencing. Noise Impact Assessment Shadow Flicker Assessment (for turbines) Glint and glare assessment (for solar schemes)
Sources of Further Guidance
Planning Advice Note 1/2011 Planning and Noise: https://www.gov.scot/publications/planning-advice-note-1-2011-planning-noise/ Good practice principles for community benefits from onshore renewable energy developments: https://www.gov.scot/publications/scottish-government-good-practice-principles-community-benefits-onshore-renewable-energy-developments/

3.23

DECOMMISIONING/RESTORATION and REPOWERING

Nature of impact	Scale of potential impacts from applicable proposals	
Decommissioning Different types of renewable and low carbon energy will have varying lifespans. Wind turbines will have a lifespan or around 25 years, whereas a CHP plan lifespan may be anything from 10-30 years depending on the specification. To ensure that energy developments are decommissioned in line with current best practice and regulatory processes, a decommissioning plan will be drawn up at application stage, with payment of a restoration bond to ensure decommissioning is undertaken. Process is likely to be as follows: • Submission of draft restoration plans at application stage; • Finalisation of restoration plans within 6-12 months prior to expiry of permission; • Conditions used to secure approval of final restoration; • Conditions used to secure monitoring and reporting; and • Financial guarantee (bond) released only on satisfactory completion of restoration. **Repowering** Repowering a wind farm site involves the removal of wind turbines and their replacement with new turbines on the same site, normally increasing overall generating capacity and output as well as reducing the total number of turbines. With many schemes developed from 2002 onwards, technology has rapidly evolved with greater capacity as well as increased distribution will increase demand for repowering existing sites.	**Wind**	One of the main environmental impacts arising from turbine removal is the removal of bases. In many cases the turbine bases are left in situ to avoid disturbance. This is particularly important for turbines located on carbon-rich soils or where habitats have become established over time. Restoration of a peatland can take from 5 to 30 years depending on the initial condition (Source: NatureScot). Raising the water table to, or near to, the surface is critical to successful restoration. In terms of repowering, sites are being repowered with fewer turbines, but a larger height to tip. In terms of landscape and visual impact this will require careful assessment through an LVIA.
	Hydro	• Visual Impact: likely to be relatively localised, but sites may be visible from paths and roads. • Noise: This could either be from the scheme itself or during the construction stage. This would depend on distance from residential properties and communities. • Safety Issues: The site including individual components of the hydro scheme should be considered in terms of public safety, particularly during the construction stage.
	Heat Pumps (air, ground and water source)	Depending on scale, location in relation to sensitive receptors.
	Deep Geothermal	Depending on scale, location in relation to sensitive receptors.
	Solar/and Photovoltaics	Depending on scale, location in relation to sensitive receptors. Unlikely to be significant due to limited ground disturbance.
	Biomass	Depending on scale, location in relation to sensitive receptors. Likely to be similar to decommissioning any industrial process or plant.
	Energy from Waste	Depending on scale, location in relation to sensitive receptors. Likely to be similar to decommissioning any industrial process or plant.
	Energy Recovery	Depending on scale, location in relation to sensitive receptors.
	Energy Storage	Depending on scale, location in relation to sensitive receptors.
	Combined Heat and Power and Decentralised Energy Networks	Depending on scale, location in relation to sensitive receptors. Heat network pipework should remain in situ, subject to future maintenance. Heat network capacity should be of the correct specification so as to future proof for future capacity requirements.

Development Plan Policy

Policy IR12 Energy Generation Development

Supporting Information Required

Careful scoping of LVIA required given the changes in turbine size and/or re-siting within the site;
Assessment of existing grid connections and infrastructure.
Reassessment of impact on aviation and radar.
Review of existing noise conditions and obligations; and
Use of environmental and ecological information compiled for the original project application, construction and from post-construction monitoring as relevant base-line data for the new application.

Sources of Further Guidance

Scottish Renewables Repowering Position Statement: https://www.scottishrenewables.com/assets/000/000/146/070317_Repowering_SR_Position_Paper_original.pdf?1553086864

LDP2 Policy Requirements

4.1 Policy IR13 of the Falkirk Local Development Plan is intended to meet the requirements of Section 3F of the Town and Country Planning Act by requiring low and zero-carbon generating technologies to be installed on new buildings in order to deliver a percentage of the carbon dioxide emissions reduction required by Building Standards. The policy is designed to ensure that the percentage reduction to be achieved through low and zero-carbon generating technology correlates with the most up-to-date building standards sustainability labelling at the time. Eligible technologies include:

- Wind;
- Solar/Photovoltaics;
- Hydro;
- Biomass;
- Deep Geothermal;
- Heat Pumps (air, water, ground);
- Combined Heat and Power (CHP) (run from renewable or low-carbon sources);
- Energy from waste sources.

4.2 Policy IR13 applies to all new domestic and non-domestic buildings. All new buildings should incorporate on-site low and zero carbon generating technologies (LZCGT) to meet a proportion of the overall energy requirements. Applicants must demonstrate that 12% of the overall reduction in CO^2 emissions as required by Building Standards has been achieved via on-site LZCGT. This proportion will be increased as part of subsequent reviews of the LDP. All proposals must be accompanied by an Energy Statement (a template can be found at Appendix 4) which demonstrates compliance with this policy. Should proposals not include LZCGT, the Energy Statement must set out the technical or practical constraints which limit the application of LZCGT.

Exceptions to the policy are;

Alterations and extensions including house extensions, and extensions to business/industrial premises.	This should be an extension to an existing building, and used as an extension of the established use, or for uses ancillary to the primary building use such as storage of goods or ancillary workers facilities.
Stand-alone buildings which are ancillary and which have an area of less than 50m².	Including garden storage shed/buildings, or an industrial storage building.
Buildings which will not be heated or cooled other than by heating provided solely for the purpose of frost protection.	Including domestic garages or a stand-along building used for agricultural purposes.
Temporary buildings with consent for 2 years or less.	Including modular buildings and temporary construction accommodation.
Where implementation of the requirement would have an adverse impact on the historic environment.	Such as where development which would impact upon the fabric or setting of designated site such as a listed building, scheduled monument or world Heritage Site.

4.3 The merits of each technology will very much depend on the characteristics, constraints and energy requirements of the development. For example, the space heating needs of a residential development will be different to an industrial development, and not every site will be able to accommodate technologies which require substantial land or infrastructure. Section 2 Locational Guidance and Section 3 Development Management Criteria set out broad constraints and considerations as they apply to each technology.

4.4 Generally, the most common technology being incorporated into domestic and non-domestic new development is solar/PV. This technology has now been incorporated into many standard house types, and does not require additional land or substantial infrastructure. Air source heat pumps are also increasingly used. For larger developments or non-domestic development with substantial energy needs, it may be that a mix of technologies could be utilised, and provision of CHP or heat recovery systems will be viable.

4.5 LDP2 which reflects national policy seeks to encourage renewable fuels as a first principle. For example, development proposals which incorporate CHP should ideally be run from renewable fuels. Building Standards sustainability labelling (Section 7) only identifies CHP fired by low-emission fuel sources as an eligible LZCGT. In order to meet the terms of LDP Policy IR13, developers should demonstrate that proposed CHP will be run from low-emission fuel sources. Whilst not strictly in accordance with LDP policy IR13, or Section 3F of the Climate Change (Scotland) Act 2009, CHP run from non-renewable sources (eg natural gas) will be considered on a case-by-case basis where it is demonstrated that renewable fuels are unviable or impractical (i.e. on a constrained site), and where there is a significant reduction in the projected carbon emissions from the development as a result of CHP.

Relationship between Building Standards and the Planning System

4.6 The Sullivan Report, published in 2007, made recommendations to the Scottish Government as to the most effective way to improve the energy performance of houses and buildings in Scotland, and thereby reduce carbon dioxide emissions. One of the most significant recommendations was to aim to achieve net zero-carbon buildings (in relation to emissions for space and water heating, lighting and ventilation) by 2016, if practical. There followed a series of stages reduction in carbon emissions from the 2007 standards, and Section 6 of the current technical handbook sets out the various aspects for compliance. Section 7: Sustainability labelling is intended, in part, to assist local authorities with meeting their Development Plan Policy obligations under Section 72 of the Climate Change (Scotland) Act 2009 by identifying the use of LZCGT, and setting out the specified reduction in carbon emissions which new development should achieve, over and above building standards. The latest Technical Handbooks can be found here: https://www.gov.scot/policies/building-standards/monitoring-improving-building-regulations/

Bronze Active	This is the baseline level where the dwelling meets the functional standards set out in sections 1 - 6 of the Handbook, but in addition the dwelling includes the use of an eligible low and zero carbon generating technology (LZCGT) in respect of meeting standard 6.1 within section 6 Energy.
Silver	A dwelling at this first optional upper level should meet all the standards in sections 1 - 6 that apply to the building for the bronze level and, in addition, the dwelling should comply with the silver level in each of the eight aspects below. These are: Aspect 1: Carbon dioxide emissions Aspect 2: Energy for space heating Aspect 3: Energy for water heating Aspect 4: Water use efficiency Aspect 5: Optimising performance Aspect 6: Flexibility and adaptability Aspect 7: Well-being and security Aspect 8: Material use and waste
Silver Active	This is the same as the silver level but, in addition, the dwelling includes the use of a low and zero carbon generating technology (LZCGT) in respect of meeting at least one of the aspects: Silver 1, Silver 2 or Silver 3.
Gold	A dwelling at this second optional upper level should meet all the standards in Sections 1 - 6 that apply to the building for the bronze level and in addition the dwelling should comply with the gold level in each of the eight aspects above.

Energy Statement Requirements

4.7 LDP2 Policy IR13 states that *"All proposals must be accompanied by an Energy Statement which demonstrates compliance with this policy. Should proposals not include LZCGT, the Energy Statement must set out the technical or practical constraints which limit the application of LZCGT."* Appendix 4 provides a template to be completed for each eligible development, and provides guidance on timing of submission of information.

4.8 Understanding the energy demands of new development is crucial to understanding how to achieve the best energy mix for the site in terms of low and zero carbon generating technologies, heat networks and where connection to the gas grid is necessary how to future proof the development for connection into heat networks in the future.

4.9 The UK Government published a research paper in 2017 showing the varying degrees of annual energy consumption per m² for different types of new build property. As of 2017, the average new build property had an energy demand of 122 kWh/m². 102 kWh/m². of this is electricity, and 12 kWh/m² is gas. There is some variance on this figure, with flats using around a combined 120 kWh/m² and bungalows using 143kWh/m². This means that for an average 3 bedroom, semi-detached property of around 100m², this would generate an **annual energy demand of 12,200 kWh.**

4.10 On average, properties not using gas use less energy overall than properties using gas (88 kW/m² and 125 kWh/m² respectively in 2017). This in part is due to properties not using gas being more likely to use other fuels (e.g.: solid-fuel burners) which are not captured in the data. At end use gas is less efficient for heating than electricity, as the efficiency losses for electric heating come at the point of generation rather than in the home.

Electric Vehicle Charging Provision

4.11 LDP2 policy IR009 states that new car parking provided as part of significant new commercial or community uses should incorporate electric vehicle charging points. Scottish Government guidance "Switched On Scotland - Action Plan" provides further detail on the Scottish Government's targets and roadmap to widespread adoption. The Scottish Government aims to phase out diesel and petrol cars by 2032.

4.12 The use of electric vehicles is one measure for reducing emissions locally and therefore the provision of necessary infrastructure which promote the use of such vehicles is essential. There are now over 10,000 ultra- low emission vehicles registered in Scotland. This is mainly due to vehicle manufacturers offering a range of plug-in vehicles, several incentive support measures offered by the UK Government and increasing public awareness of the impact of road transport emissions on the environment.

4.13 The technology for charging and vehicles is rapidly evolving, and developers should seek out best practice guidance. The Institute for Engineering and Technology provides up to date guidance: https://electrical.theiet.org/guidance-codes-of-practice/publications-by-category/electric-vehicles/

4.14 Developers are expected to future-proof new developments by providing charging facilities within curtilage of new domestic properties, and within the parking areas for business and community developments. A distinction is made between "passive" and "active" EV provision.

Active - A socket connected to the electrical supply system that vehicle owners can plug their vehicle into.

Passive - The network of cables and power supply necessary so that at a future date a socket can be added easily. This future-proofs a development for the growing demand for EV infrastructure.

4.15 A growing number of planning authorities have specified fixed rates of provision for passive and active PV. All domestic properties will have passive provision, as a charging point can easily be fitted on demand to a domestic supply. Many housebuilders are now choosing to install charge points into new properties as standard.

4.16 There are relatively few technical barriers to installation as part of new development, alongside provision of all other infrastructure. Where retrofitting is required, either as a standalone project or as part of redevelopment, barriers such as sub-ground archaeology or environmental constraints, or existing infrastructure or service wayleaves may exist and would be assessed on a case-by-case basis.

4.17 Policy IR09 requires new car parking provided as part of significant new commercial or community uses to incorporate electric vehicle charging points. Whilst not specifically identified in the scope of policy IR09, new residential should cover EV provision in the submitted Transport Assessment (where required) and the Energy Statement. It is assumed that detached, semi-detached and terraced dwellings with private parking spaces will be able to offer 100% passive provision. Developments with shared parking areas will be required to meet a level of provision, unless site constraints mean that provision is not possible. Developments should aim to meet the minimum requirements. Transport Assessments for new developments may also identify an enhanced requirement for additional EV infrastructure, in which case this should be provided. The following table sets out the minimum requirements for both passive and active provision in new development:

	Minimum Passive Provision	Minimum Active Provision
Residential		
Detached, semi-detached and terraced properties or flatted dwellings with private parking provision	100%	
Dwellings with shared parking provision	20% *	
Non-Domestic		
Retail and commercial leisure (over 500m²)	10% *	2% *
Office and business (with dedicated private parking)	20% *	2% *
Community and institutional uses (e.g. school or education uses, health facility)	20% * (equal split between visitor parking and staff parking)	2% * (equal split between visitor parking and staff parking)

* The calculated requirement should be rounded up to one whole space.

Case Study: Falkirk Stadium Low Carbon Vehicle Hub

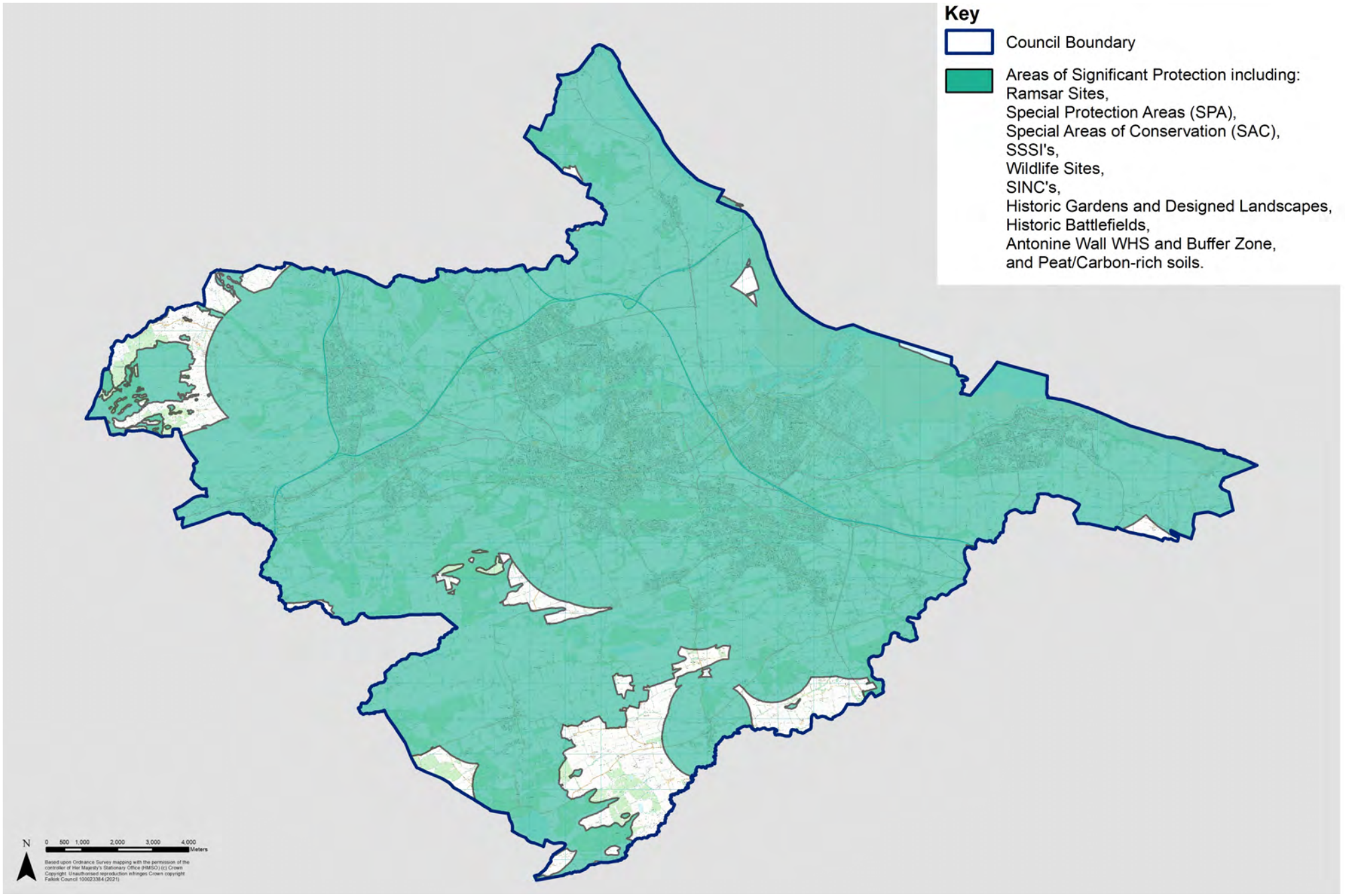
Developer: Falkirk Council

Output: 350/400kw.

Project description: The largest electric vehicle (EV) charging station in Scotland was developed at the Falkirk Stadium. The £1.4m has capacity for 26 electric vehicles, and scope further connections across the 156 bays. The new EV station will generate over 30% of the required electricity to power the facility from its own solar canopy made up by 1272 panels covering an area of over 2,000sqm, saving 75 tonnes of carbon per year. It also brings the number of EV charging bays in the Falkirk and Grangemouth area to 68, an increase of almost 70%. Funding for the project came through Falkirk Council, the Scottish Government and the European Regional Development Fund through Transport Scotland's Low Carbon Travel and Transport Challenge Fund.

Planning Policy: Policies are broadly supportive of new renewable and low carbon energy development.

Key Constraints: **Policy IR09 Parking** requires significant new commercial or community uses to incorporate electric vehicle charging points. This was a part of the existing stadium complex, but the principles can be replicated on new developments with significant parking requirements.


Key
Council Boundary
Areas of Significant Protection including:
Ramsar Sites,
Special Protection Areas (SPA),
Special Areas of Conservation (SAC),
SSSI's,
Wildlife Sites,
SINC's,
Historic Gardens and Designed Landscapes,
Historic Battlefields,
Antonine Wall WHS and Buffer Zone,
and Peat/Carbon-rich soils.
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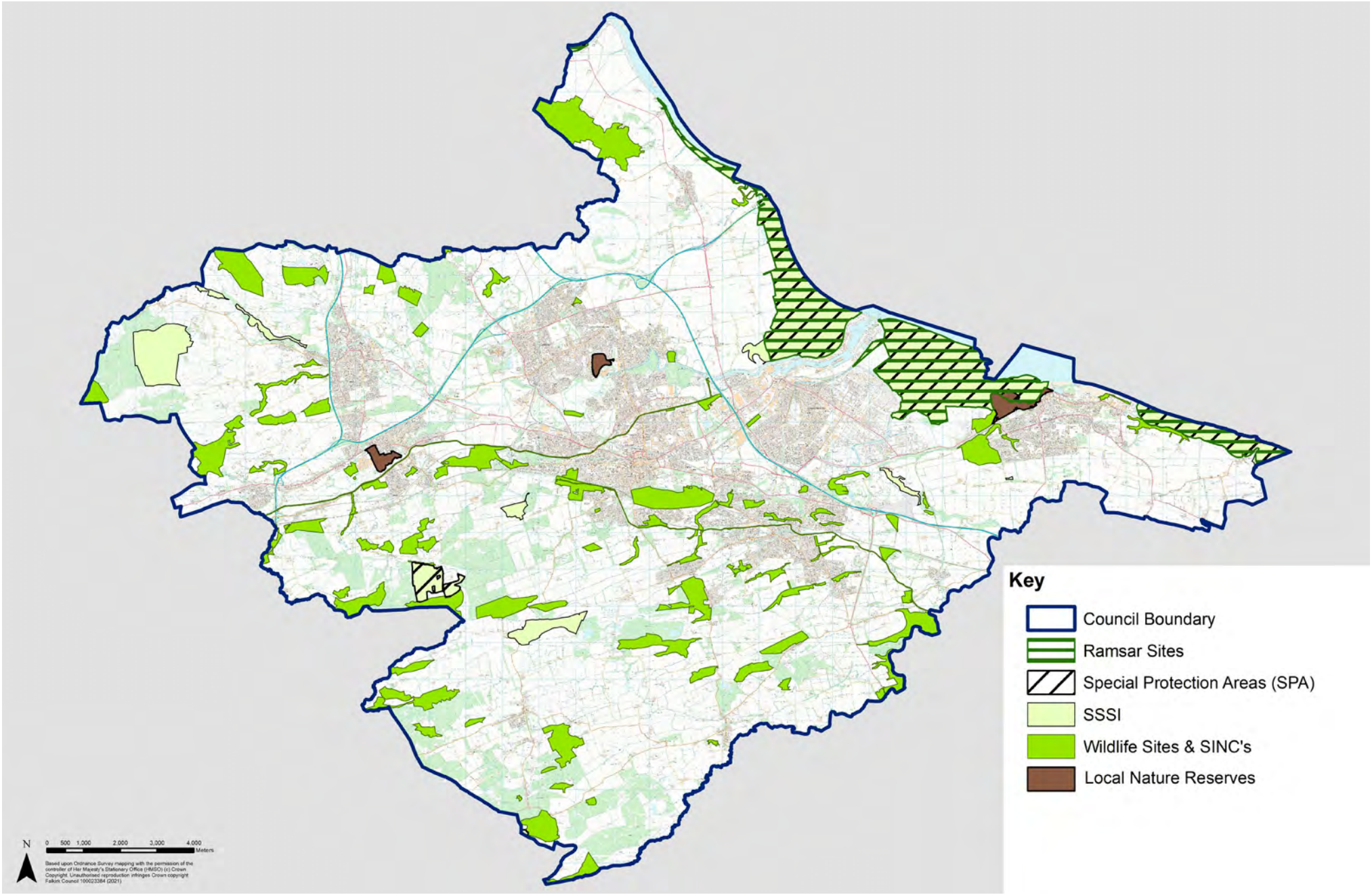
Key
Council Boundary
Ramsar Sites
Special Protection Areas (SPA)
SSSI
Wildlife Sites & SINC's
Local Nature Reserves
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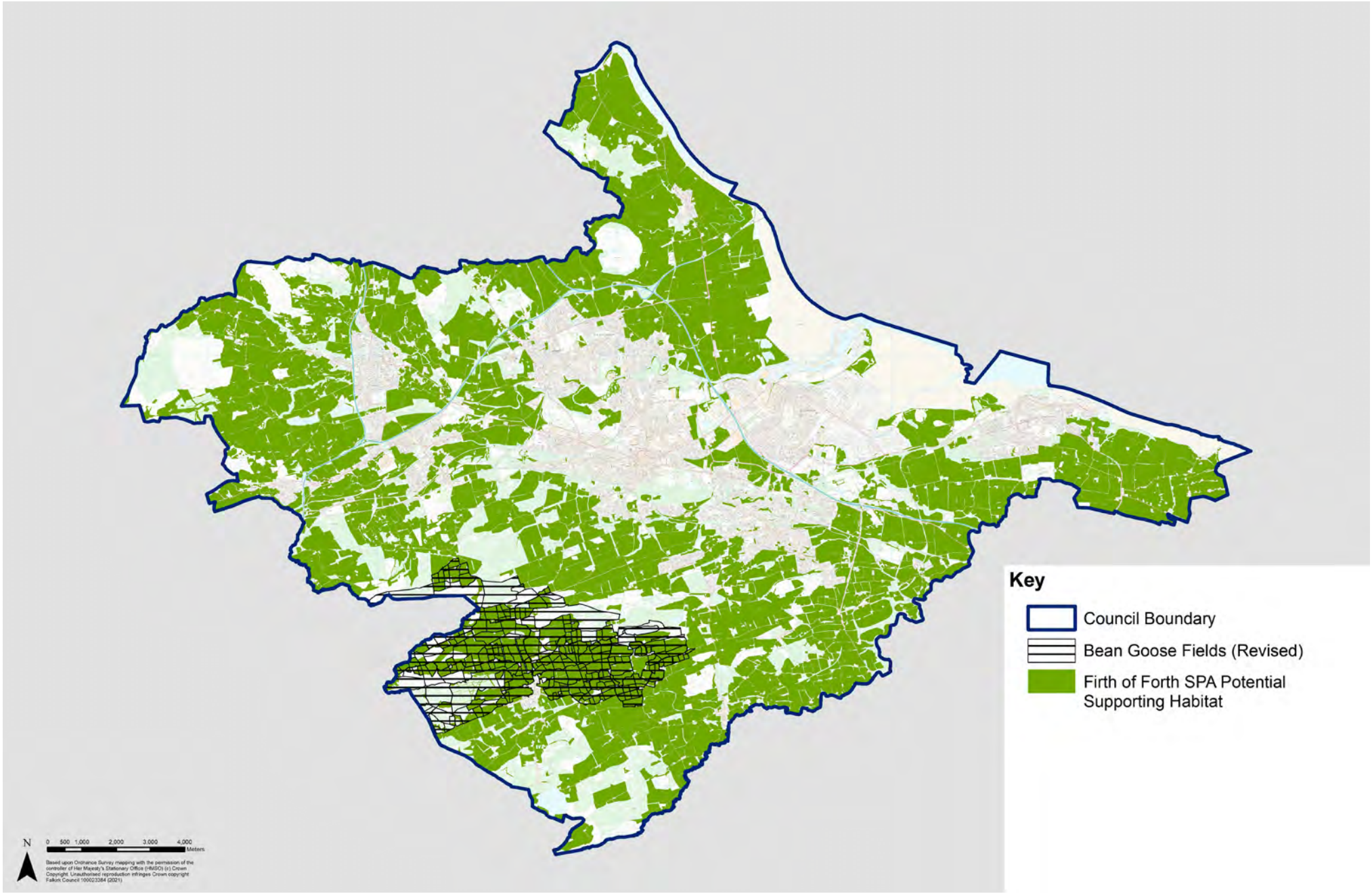
Key
Council Boundary
Bean Goose Fields (Revised)
Firth of Forth SPA Potential Supporting Habitat
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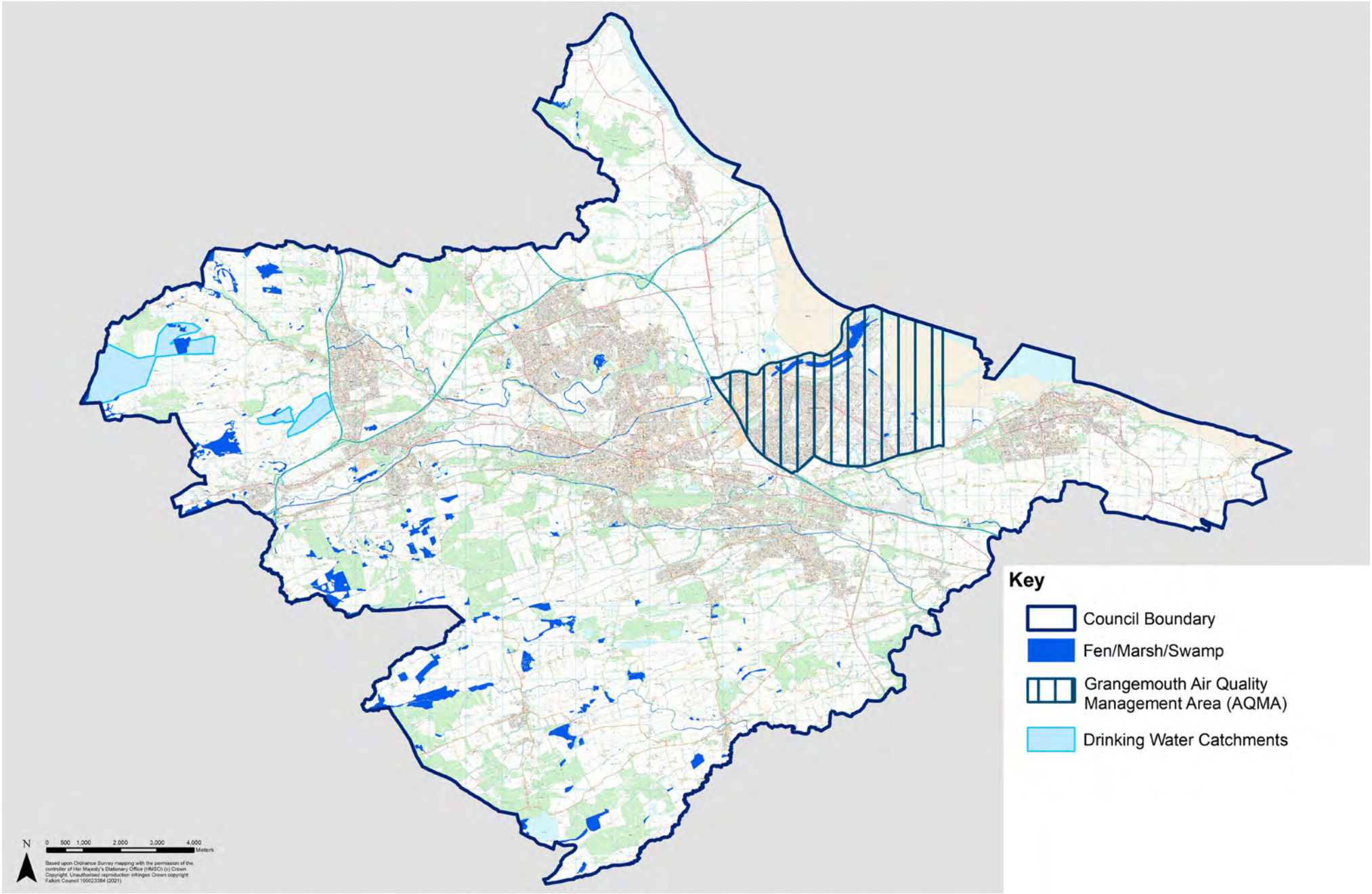
Meters


Key
Council Boundary
Fen/Marsh/Swamp
Grangemouth Air Quality Management Area (AQMA)
Drinking Water Catchments
N
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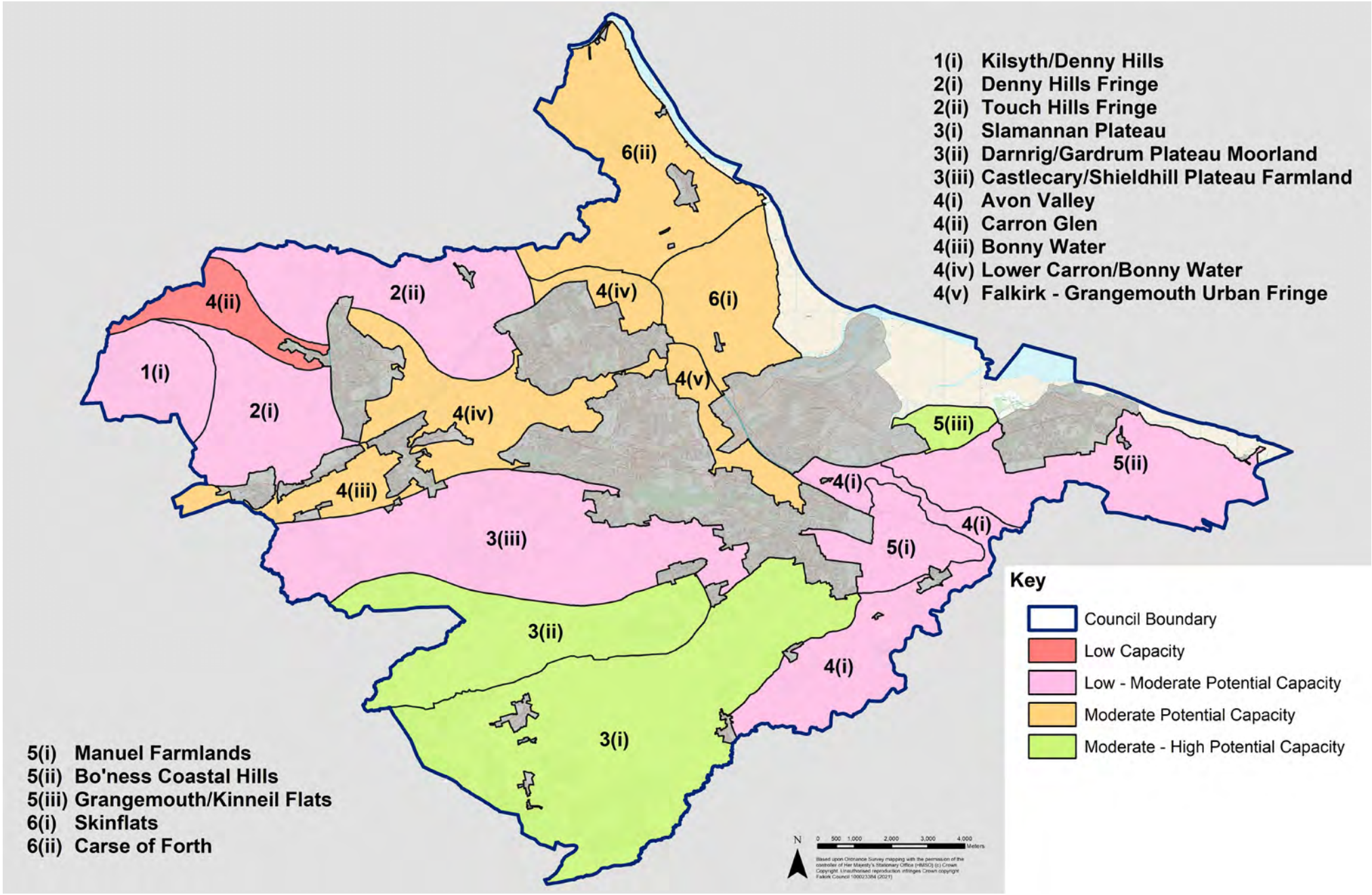
1(i) Kilsyth/Denny Hills
2(i) Denny Hills Fringe
2(ii) Touch Hills Fringe
3(i) Slamannan Plateau
3(ii) Darnrig/Gardrum Plateau Moorland
3(iii) Castlecary/Shieldhill Plateau Farmland
4(i) Avon Valley
4(ii) Carron Glen
4(iii) Bonny Water
4(iv) Lower Carron/Bonny Water
4(v) Falkirk - Grangemouth Urban Fringe
5(i) Manuel Farmlands
5(ii) Bo'ness Coastal Hills
5(iii) Grangemouth/Kinneil Flats
6(i) Skinflats
6(ii) Carse of Forth
Key
Council Boundary
Low Capacity
Low - Moderate Potential Capacity
Moderate Potential Capacity
Moderate - High Potential Capacity
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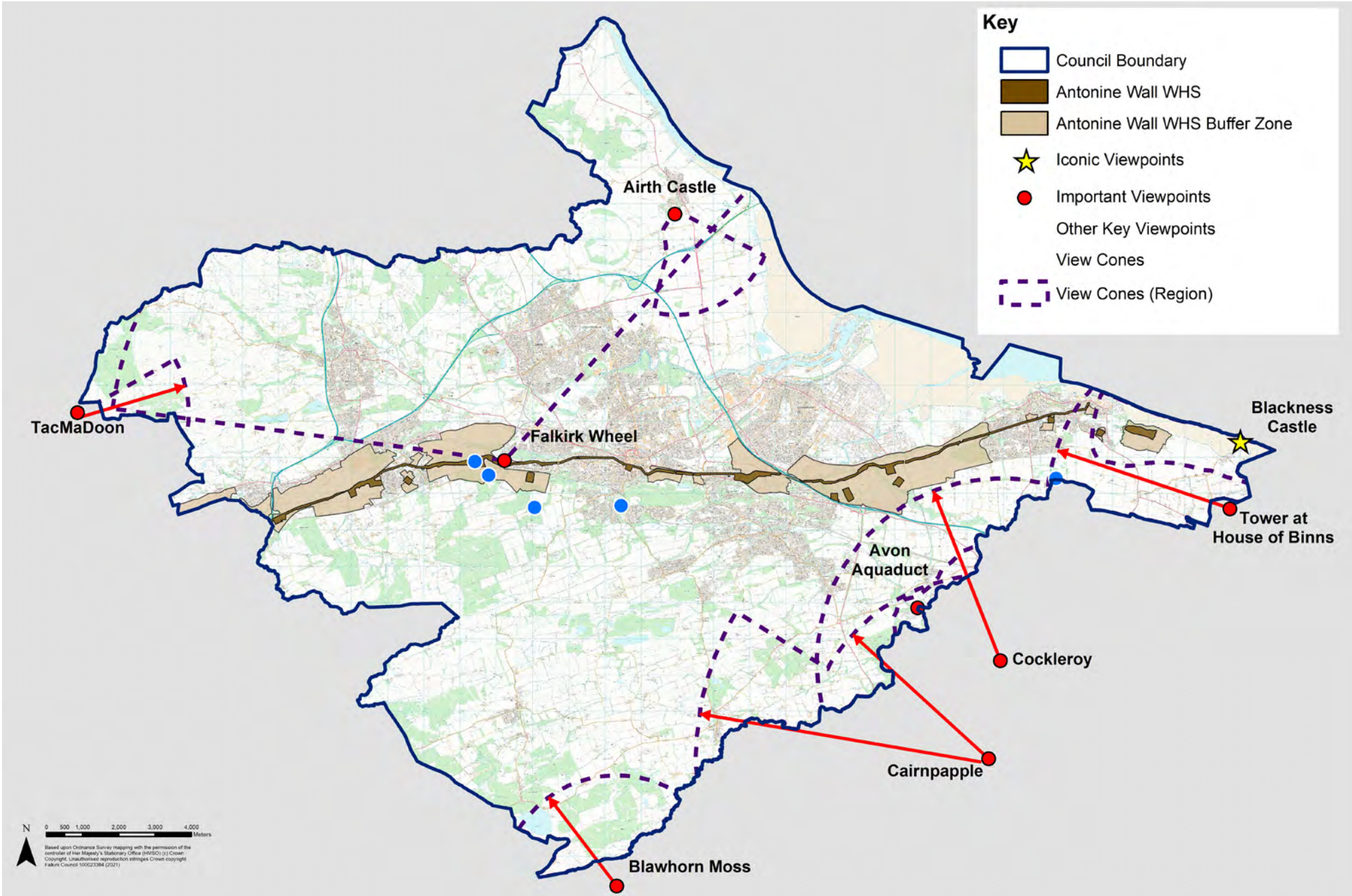
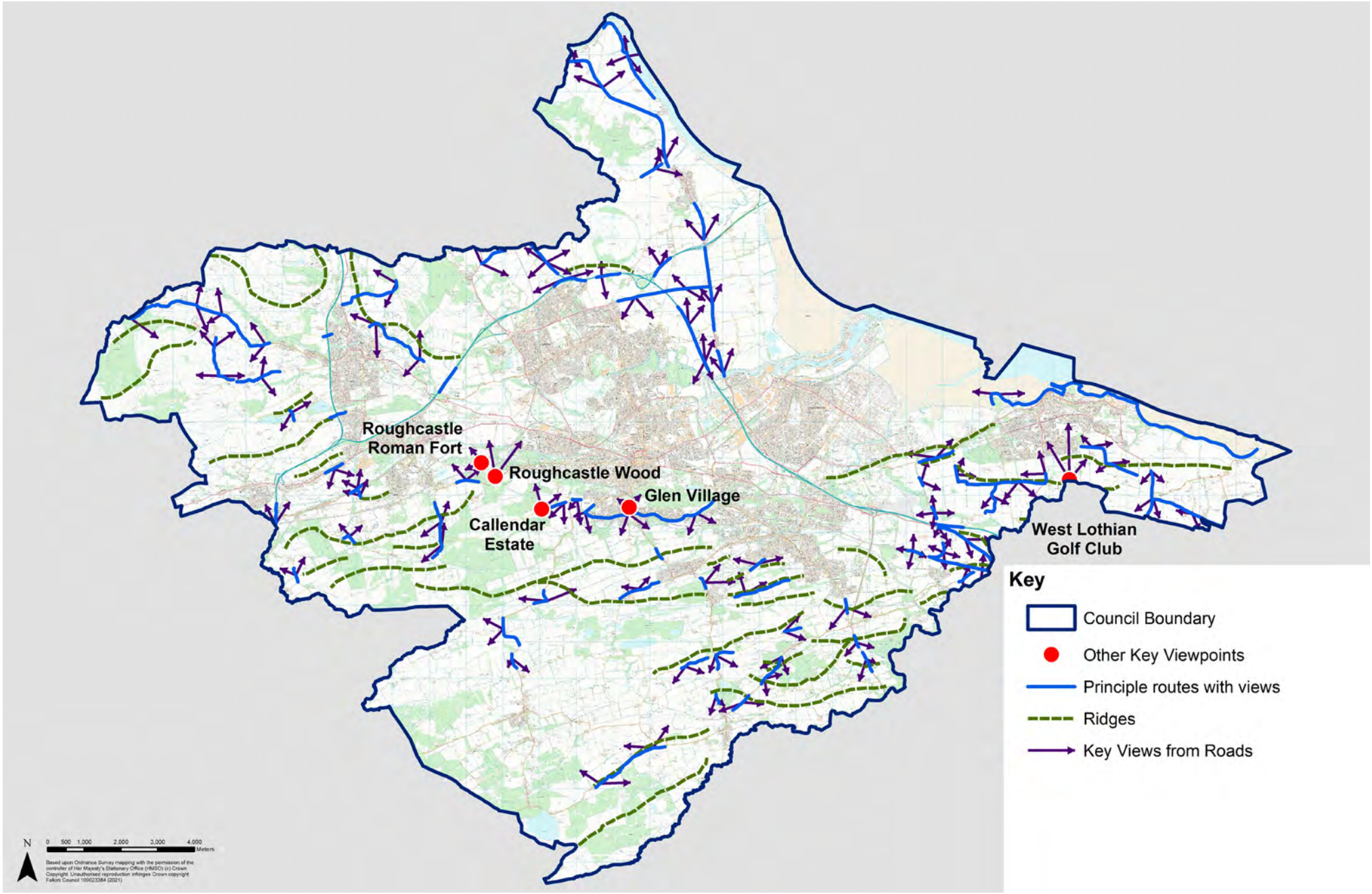
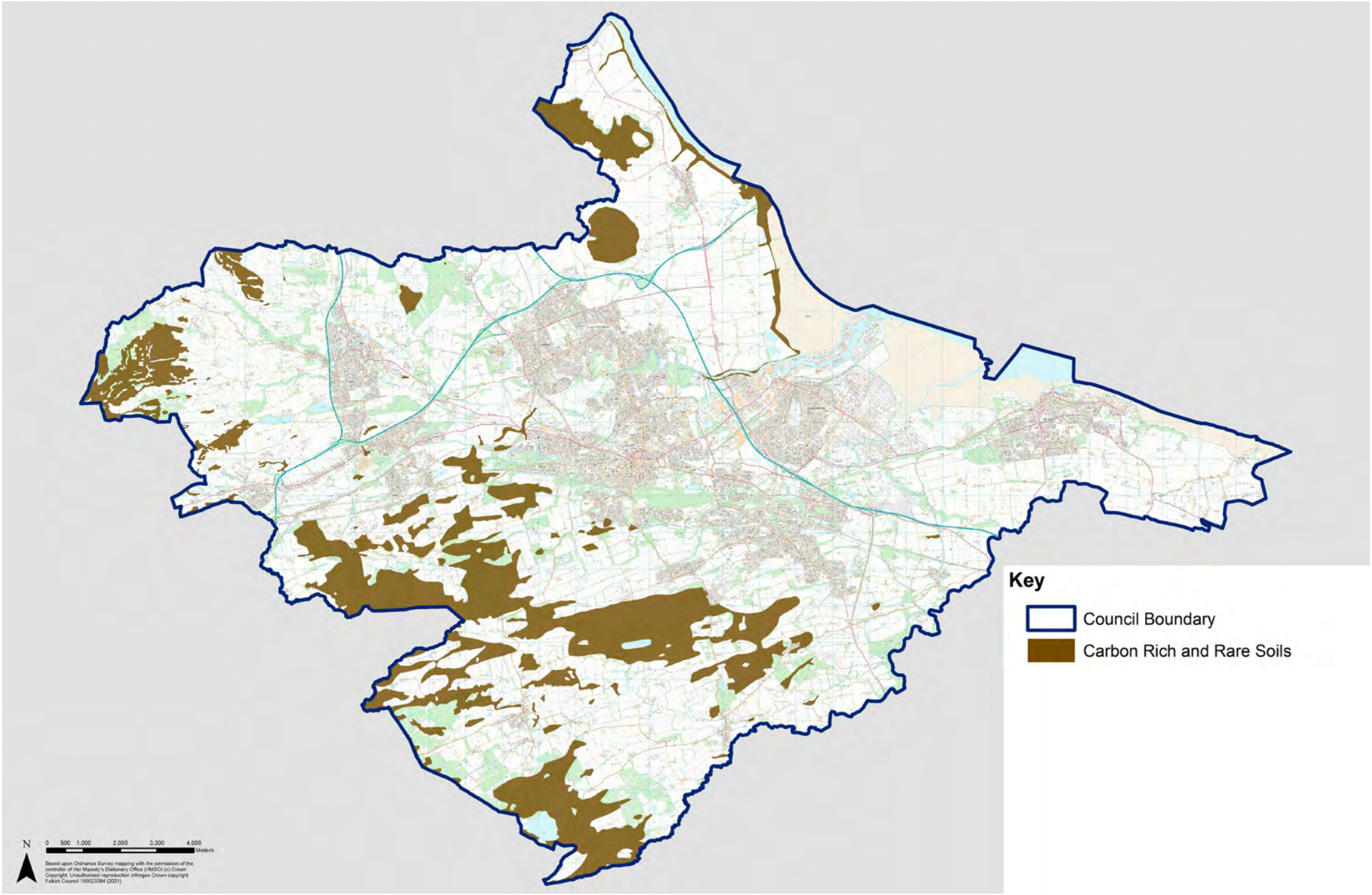

Key
Council Boundary
Antonine Wall WHS
Antonine Wall WHS Buffer Zone
Iconic Viewpoints
Important Viewpoints
Other Key Viewpoints
View Cones
View Cones (Region)
Airth Castle
TacMaDoon
Falkirk Wheel
Blackness Castle
Tower at House of Binns
Avon Aquaduct
Cockleroy
Cairnpapple
Blawhorn Moss
N
0 500 1,000 2,000 3,000 4,000 Meters

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Council Boundary
Carbon Rich and Rare Soils
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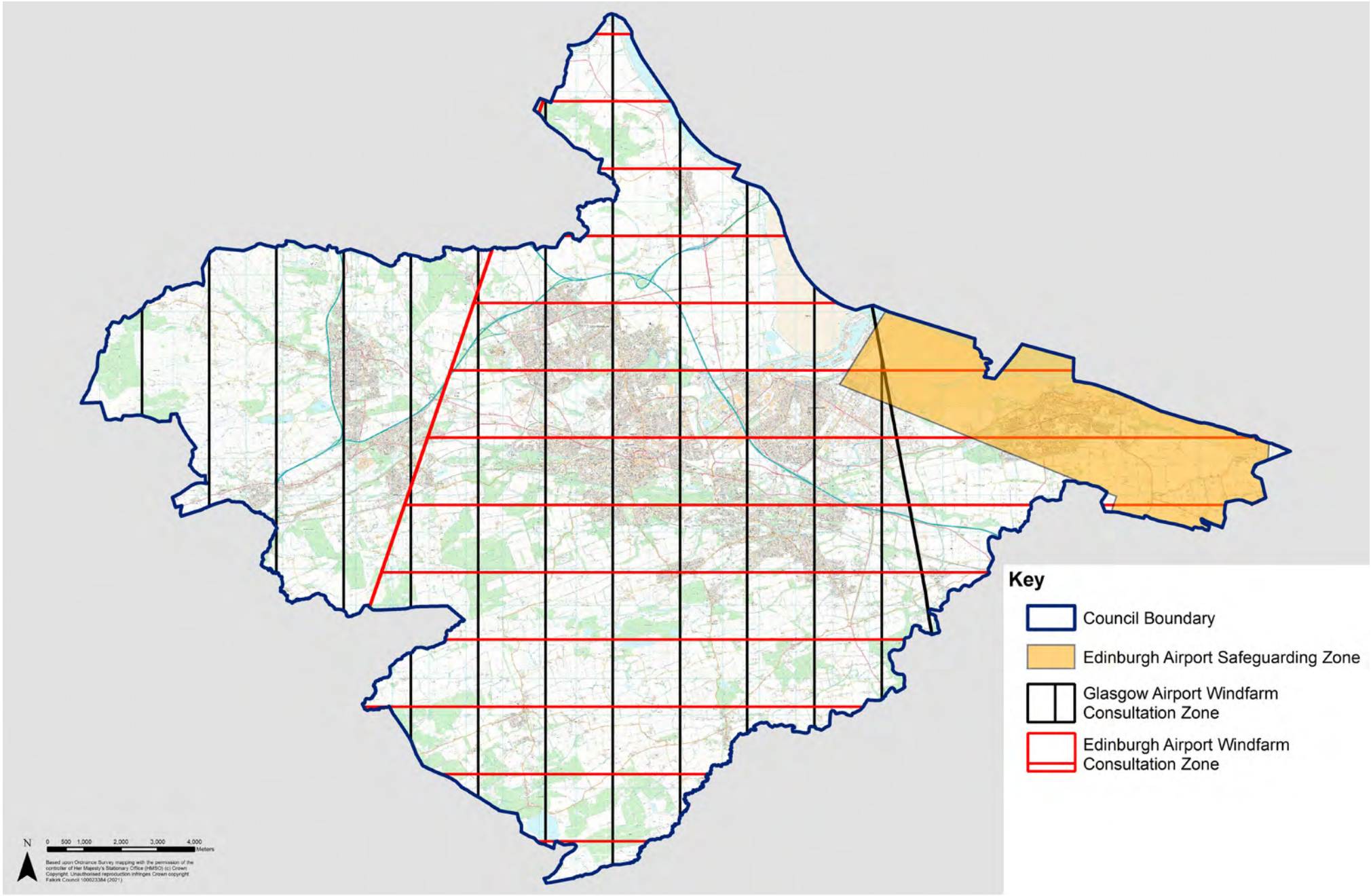
Key
Council Boundary
Edinburgh Airport Safeguarding Zone
Glasgow Airport Windfarm Consultation Zone
Edinburgh Airport Windfarm Consultation Zone
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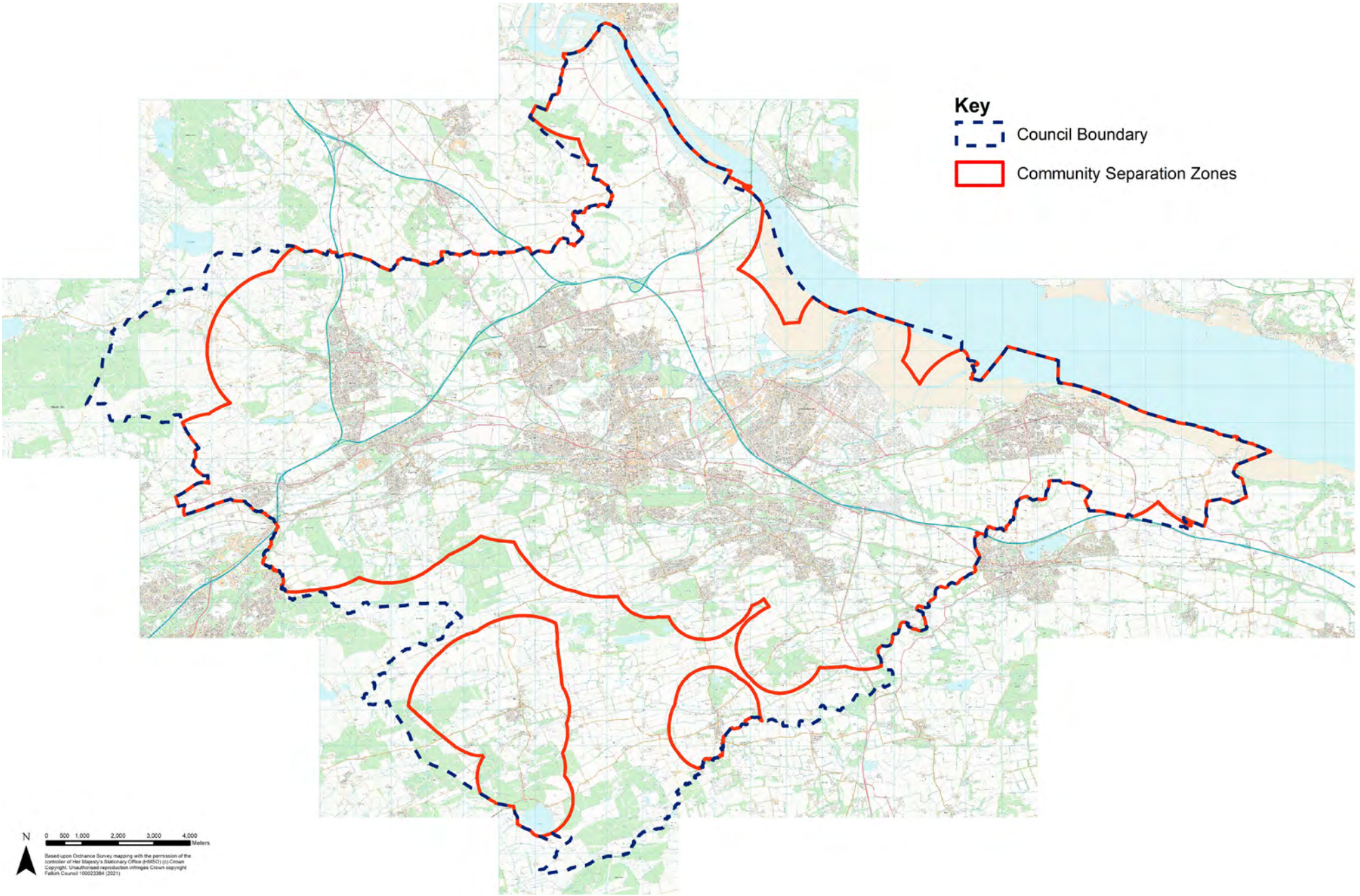
Meters


Key
Council Boundary
Community Separation Zones
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Appendix 2 : Development Management Checklist For Energy Developments

- [ ] A Landscape & Visual Assessment (See Appendix 3 for level of information required)
- [ ] EIA Screening Request and Scoping
- [ ] Traffic Management Plan
- [ ] Design and Access Statement
- [ ] Environmental statement (EIA or Non-EIA)/ecological appraisal addressing the Landscape and Visual assessment, ecology, water environment including relevant cumulative assessments of factors to consider in combination with other development (energy or non-energy related)
- [ ] Amenity Assessments: Glint and Glare, shadow flicker, noise, air, pollution
- [ ] Assessment of economic benefit. This may include community ownership potential, contribution to national targets and alleviation of fuel poverty
- [ ] Flood Risk Assessment (where appropriate)
- [ ] Provision for future energy storage and/or district heating opportunities
- [ ] Amenity Assessments: Glint and Glare, shadow flicker, noise, air, pollution
- [ ] HSE (Health and Safety Executive) assessments such as impact on pipeline corridors or any Hazardous Substances Consent requirements
- [ ] Construction Management Plan
- [ ] Site Decommissioning Plan

Appendix 3 : Landscape Capacity Guidance for Wind Energy Developments

All applications will be decided on their own merits and must include detailed landscape and visual impact assessment (unless agreed otherwise) including consideration of all criteria within this specific guidance and within SG09 Landscape Character Assessment and Landscape Designations. A number of the Landscape Character Areas contain Local Landscape Areas, and further information on the characteristics of each of these can be found in Appendix 2 in SG09.

Capacity within Local Landscape Character Area 1(i) Kilsyth/Denny Hills

Capacity for Wind Energy Development: Low - Moderate

Main Landscape Objective: Protect and maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity.

Important Landscape Features:

- The LCU falls within the Denny Hills Local Landscape Area (LLA), which are locally valued special landscapes with particular qualities and characteristics relative to the surrounding area;
- Turbines located on prominent ridges or which affect important views to the hills or from the hills to other hill features or the Forth;
- Views to/from the Antonine Wall;
- Important viewpoints at TacMaDoon and the Falkirk Wheel should be safeguarded;
- There are smaller scale and simple landforms within this LCU. Proposals should not disrupt the intactness and unity of the continuity of long sweeping horizons. Proposals should avoid breaching the skyline in many views. The more rugged northern end of LCU limits development potential for taller structures such as turbines;
- Turbines and associated infrastructure could undermine perceptions of naturalness and sense of seclusion in the southern end away from busy roads.

Cumulative Impacts:

- Potential cumulative effects of new development seen within views of existing windfarms at Craigengelt and Earlsburn will need careful assessment;
- There is the potential for ‘in combination’, ‘in succession’ and/or ‘sequential’ cumulative effects from locations within the Kilsyth/Denny Hills and when travelling through adjacent character areas which could create the perception of a landscape dominated by wind turbines where the landscape, and in particular visual sensitivity, is unable to accept such a level of change;
- Views to/from the Antonine Wall;
- In particular views from sensitive routes such as the B818 through the Carron Glen require careful analysis;
- Proposals should consider impact of development in conjunction with commercial forestry operations and the resultant changes in the landscape;
- Solar development (larger scale) is identified as a force for change in SG09.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable. Proposals should consider the following:

- Turbines should relate well to the existing landscape and existing buildings in terms of scale and design;
- Small turbines could be a better fit with the scale and simple landform but they could disrupt the intactness and unity of the continuity of long sweeping horizons as well as the skylines;
- The more rugged northern end limits development potential;
- Turbines and associated infrastructure could undermine perceptions of naturalness and sense of seclusion in the southern end away from busy roads.

Turbines over 50m to tip: Unlikely to be acceptable, with potentially significant effects on key visual criteria in particular. Larger turbines would be out of scale with the landscape.

Capacity within Local Landscape Character Area 2(i) Denny Hills Fringe

Capacity for Wind Energy Development: Low - Moderate

Main Landscape Objective: Protect and maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity.

Important Landscape Features:

- The LCU falls within the Denny Hills Local Landscape Area (LLA), which are locally valued special landscapes with particular qualities and characteristics relative to the surrounding area;
- All turbines would be highly visible from an extensive area;
- Views from important viewpoints and sensitive routes cover significant parts of the area, and prominent ridges are important to intervisibility where wind turbines would be particularly visible. There are important views from the Denny Hills Fringe to the Kilsyth/Denny Hills and across the Carron Glen to the Touch Hills Fringe and the Touch Hills beyond the Falkirk Council boundary, where wind turbines would be harmful to the setting and landscape context of the landscape character area;
- The southern part of the landscape character area has a strong visual relationship with the Antonine Wall World Heritage Site (WHS) with views to and from the WHS where development has the potential to affect the setting of the Wall;
- Turbines could intrude on views from popular walking routes. They would contrast with the settled nature and scale of the landscape. When seen in views of features in the distance, for example from the Falkirk Wheel 'important' viewpoint, they could intrude on the composition and affect the perception of distance;
- Turbines could affect the perception of vertical scale of the hill fringes due to their limited height and small-medium scale, and could detract from the moulded landform of the relatively smooth, interlocking organic forms of small dips and hills.

Cumulative Impacts:

- Turbines would add to the existing clutter of man-made elements and compete visually with the transmitters at Myot Hill, and existing electricity transmission lines and pylons. Existing wind turbines within the landscape will also contribute to cumulative impact;
- Solar development (larger scale) is identified as a force for change in SG09.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable. Proposals should consider the following:

- Turbines should relate well to the existing landscape and existing buildings in terms of scale and design;
- Small turbines could be a better fit with the scale and simple landform but they could disrupt the intactness and unity of the continuity of long sweeping horizons as well as the skylines;
- The more rugged northern end limits development potential;
- Turbines and associated infrastructure could undermine perceptions of naturalness and sense of seclusion in the southern end away from busy roads.

Turbines over 50m to tip: Unlikely to be acceptable, with potentially significant effects on key visual criteria in particular. Larger turbines would be out of scale with the landscape.

Other Renewable and Low Carbon Technologies:

- Solar development (larger scale) is identified as a force for change in SG09 which may be difficult to accommodate within parts of the LCU. Depending on the scale, there are sensitive viewpoints within the LCU which may be affected by solar developments.

Capacity within Local Landscape Character Area 2 (ii) Touch Hills Fringe

Capacity for Wind Energy Development: **Low - Moderate**

Main Landscape Objective: Protect and maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity.

Important Landscape Features:

- The LCU falls within the Denny Hills Local Landscape Area (LLA), which are locally valued special landscapes with particular qualities and characteristics relative to the surrounding area;
- Key landscape characteristics sensitive to wind energy development are the generally small, enclosed nature of the hill fringes. They feature in views from an extensive area, providing a distinctive raised fringe to the north of the Falkirk Council area, with hills beyond. Turbines would be highly visible and could contrast with and be out of proportion when seen within views of the existing turbines in the Stirling Council area;
- Turbines located within views from important viewpoints or on prominent ridges would be particularly damaging. Large turbines would dominate the undulating landform and adversely affect the perception of vertical scale due to the limited height of the hill fringes and their small-medium scale. The areas distinctly rural and diverse character would be diminished by regimented rows of turbines.

Cumulative Impacts:

- Cumulative impact with turbines in the Stirling Council area will require careful assessment;
- Solar development (larger scale) is identified as a force for change in SG09.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable. Proposals should consider the following:

- Some areas with an urban fringe character where there is existing infrastructure may be able to accommodate some wind energy development as long as overall landscape character and visual amenity is retained;
- Small scale development less than 50m in height may be acceptable where it relates well to the existing landscape in terms of scale and design, and where it relates well to existing buildings in terms of scale and location.

Turbines over 50m to tip: Unlikely to be acceptable, with potentially significant effects on key visual criteria in particular. Larger turbines would be out of scale with the landscape.

Other Renewable and Low Carbon Technologies:

- Solar development (larger scale) is identified as a force for change in SG09 which may be difficult to accommodate within parts of the LCU. Depending on the scale, there are sensitive viewpoints within the LCU which may be affected by solar developments.

Capacity within Local Landscape Character Area 3(i) Slamannan Plateau

Capacity for Wind Energy Development: **Moderate - High**

Main Landscape Objective: Landscape accommodation is the most appropriate objective. There may be important landscape-related constraints in terms of the siting and scale of wind energy development, but suitably designed wind turbine groups which generally fit within the landscape could potentially be accommodated even though they may have an impact on the landscape locally. The landscape could become a landscape with some wind energy development.

Important Landscape Features:

- The north western part of the area is covered by the Slamannan Plateau /Avon Valley Local Landscape Area;
- The Slamannan Plateau extends over much of the Falkirk Council area, with a complexity and variety of landcover. The gently undulating farmland forms a series of distinctive folds and a pronounced west-east pattern with a generally flattened, softly-contoured landform with unobtrusive valleys where large turbines would dominate;
- The larger wind turbine typology heights and groups of turbines would be appropriate in some parts of the plateau. In other parts larger turbines would introduce new large-scale industrial elements into a landscape generally free from intrusive elements such as power lines, pylons and other infrastructure.

Cumulative Impacts:

- Cumulative impact with the significant number of operational and consented turbines will require careful assessment;
- Solar development (larger scale) is identified as a force for change in SG09.

Turbines of less than 50m to tip: Smaller turbines could be accommodated subject to careful siting and cumulative assessment.

Turbines over 50m to tip: The larger wind turbine typology heights and groups of turbines would be appropriate in some parts of the plateau. In other parts larger turbines would introduce new large-scale industrial elements into a landscape generally free from intrusive elements such as power lines, pylons and other infrastructure.

Capacity within Local Landscape Character Area 3(ii) Darnrig/Gardrum Plateau Moorland

Capacity for Wind Energy Development: **Moderate - High**

Main Landscape Objective: Landscape accommodation is the most appropriate objective. There may be important landscape-related constraints in terms of the siting and scale of wind energy development, but suitably designed wind turbine groups which generally fit within the landscape could potentially be accommodated even though they may have an impact on the landscape locally. The landscape could become a landscape with some wind energy development.

Important Landscape Features:

- A small part of the area is covered by the Slamannan Plateau /Avon Valley Local Landscape Area;
- The simple, featureless and unsettled composition of landcover on the Darnrig / GardrumPlateau Moorland contrasts with the more complex and varied character of the Slamannan Plateau;
- Turbines could relate to the simplicity of landform and absence of notable features. Turbines would not provide unfavourable scale comparison with buildings due to the sparse settlement but the perception of vertical scale due to minor changes in topography and the presence of occasional shelterbelts north of Wester Jaw would limit acceptable turbine height.

Cumulative Impacts:

- Cumulative impact with the significant number of operational and consented turbines will require careful assessment.

Turbines of less than 50m to tip: Smaller turbines either in groups or single turbines are likely to appear too small and trivial on the broader, more open moorland areas. Areas of former industrial or quarry workings would be preferable, where infrastructure elements are already present. Turbines should avoid features that add interest to the landscape and which draw the eye - however even relatively small turbines would become new foci in this simple, featureless landscape.

Turbines over 50m to tip: The strong visual integrity of the open moor would be affected by large turbines, and careful siting and design would be necessary to avoid impacts on the more remote and natural areas of moorland.

Capacity within Local Landscape Character Area 3(iii) Castlecary/Shieldhill Plateau Farmland

Capacity for Wind Energy Development: Low - Moderate

Main Landscape Objective: Landscape protection should be the objective to maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity.

Important Landscape Features:

- The Castlecary/Shieldhill Plateau Farmlands form an undulating, gently rising ridge of high ground when viewed from the lowland, settled urban edge to the north. The setting of the farmlands, which provide an important backdrop and transition between the sheltered, largely urbanised lowland river valley and the exposed moorland plateau, is a key landscape sensitivity;
- Key visual sensitivities are views from sensitive routes and prominent ridges, other views to landscape features including the Ochil Hills and the Kilsyth/Denny Hills, and to the Firth of Forth, and views to / from the Antonine Wall, as well as a number of popular walking and cycling routes;
- The farmlands are sensitive to larger turbines due to the appreciation of vertical scale. Turbines would be highly visible from an extensive area, where they would add to the clutter of existing man-made elements and visually compete with the Westerglen transmitters, although woodland would provide some containment and screening;
- The semi-complex character due to the fragmented pattern of agricultural land use, forestry and infrastructure would suggest that some small scale wind energy development could be accommodated, but impacts on key visual criteria would potentially be significant.

Cumulative Impacts:

- Cumulative impact with the significant number of operational and consented turbines will require careful assessment.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable where it relates well to the existing landscape in terms of scale and design, and where it relates well to existing buildings in terms of scale and location.

Turbines over 50m to tip: The larger wind turbine typology heights above 50m are unlikely to be acceptable, with potentially significant effects on key visual criteria in particular.

Capacity within Local Landscape Character Area 4(i) Avon Valley

Capacity for Wind Energy Development: **Low - Moderate**

Main Landscape Objective: Landscape protection should be the objective to maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity.

Important Landscape Features:

- Key landscape characteristics sensitive to wind energy development are the generally small, enclosed nature, and the steep sided valley of the River Avon;
- Key visual sensitivities are views from 'important' viewpoints at Cockleroy, Cairnpapple in West Lothian and the Avon Aqueduct, and prominent ridges;
- The Avon Valley has a variable pattern of woodlands and small scale farmland, with a strong relationship between landform and landcover;
- Turbines would affect the appreciation of the intimate scale of the landscape and could not be physically accommodated on the steep slopes and in the valley bottom. Turbines would diminish the perception of containment and depth of the valley if located within or on the valley tops;
- Turbines would affect the proportion and balanced, harmonious pattern of open space/farmland/woodland and would disrupt the strong relationship between landscape elements and appreciation of the diverse land cover. Even small turbines would become a dominant focus in some views even where woodland cover offers some screening;
- Turbines would introduce new industrial features where little currently exists, diminishing the largely undeveloped, strongly rural character of the river valley. Visually turbines would extend beyond the containment of the valley and appear truncated in many views when travelling through the area.

Cumulative Impacts:

- There are a number of consented and operational wind energy developments within this landscape character area. Cumulative assessment will be required to assess the 'in combination' visual impacts on sensitive receptors and from key viewpoints.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable where it relates well to the existing landscape in terms of scale and design, and where it relates well to existing buildings in terms of scale and location.

Turbines over 50m to tip: Larger turbines would be incompatible in scale, form and style of existing settlements. The small-scale landscape together with key visual sensitivities means that larger typologies are unlikely to be able to be accommodated.

Capacity within Local Landscape Character Area 4(ii) Carron Glen

Capacity for Wind Energy Development: Low

Main Landscape Objective: Landscape protection should be the objective to maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity.

Important Landscape Features:

- Key characteristics of this area are the small scale, in parts narrow and enclosed, steep sided valley where the River Carron winds its way between adjacent character areas of the Lowland Hills and Lowland Hill Fringes LCTs which provide a distinctive and in parts dramatic setting and important backdrop to the valley;
- Wind energy development could have a significant effect on key landscape characteristics creating significant character change. Turbines would affect the appreciation of the intimate scale of the landscape and could not be physically accommodated on the steep slopes and in the valley bottom;
- Turbines would diminish the perception of containment and depth of the valley if located within or on the valley tops;
- Wind turbine development could create significant adverse visual impact in views from sensitive routes and prominent ridges, or which affect views of the surrounding hills and hill fringes which are important to the setting of the area. Turbines on the valley tops would be out of scale and produce an unbalanced view, creating cumulative impacts. The differentiation between neighbouring character types would be lost with wind energy development on the valley sides, and it would be better to restrict turbines to the hills. Visually turbines would extend beyond the containment of the valley and appear truncated in many views from outside the area.

Cumulative Impacts:

- There are views of the existing turbines at Earlsburn and Craigengelt in Stirling Council area.

Turbines of less than 50m to tip: All wind turbine typology heights above 20m are unlikely to be acceptable, with potentially significant effects on key landscape and visual criteria. Small scale development less than 20m in height may be acceptable if it relates well to the existing landscape in terms of scale and design, and if it relates well to existing buildings in terms of scale and location.

Turbines over 50m to tip: Larger turbines are unlikely to be supported.

Capacity within Local Landscape Character Area 4(iii) Bonny Water

Capacity for Wind Energy Development: **Moderate**

Main Landscape Objective: Landscape protection is required in those areas where the objective is to maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity. In other areas suitably designed wind turbine groups which generally fit within the landscape could potentially be accommodated even though they may have an impact on the urban fringe landscape locally.

Important Landscape Features:

- Turbines would affect important views from sensitive routes to the hills or hill fringes or up to the plateau farmlands which would create significant visual impact;
- In particular, the Bonny Water lowland river valley lies almost completely within the Antonine Wall World Heritage Site buffer zone which is designed to protect the landscape setting of the World Heritage Site, where wind energy development could create significant visual impact;
- Some wind energy development within the urban fringe may be appropriate where it is in keeping with the character of the landscape, where existing transport routes, associated infrastructure and other development may combine to reduce the impact of new turbines.

Cumulative Impacts:

- There are cumulative impacts in relation to infrastructure and other existing and proposed development. If it was considered that the addition of new development would breach the threshold or 'tipping point' of landscape change, the Council would need to consider whether the resulting landscape, visual and cumulative effects would be acceptable, particularly where sited close to residential property.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable where it relates well to the existing landscape in terms of scale and design, and where it relates well to existing buildings in terms of scale and location.

Turbines over 50m to tip: Larger turbines are unlikely to be acceptable.

Capacity within Local Landscape Character Area 4(iv) Lower Carron/Bonny Water

Capacity for Wind Energy Development: **Moderate**

Main Landscape Objective: Landscape protection is required in those areas where the objective is to maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity. In other areas suitably designed wind turbine groups which generally fit within the landscape could potentially be accommodated even though they may have an impact on the urban fringe landscape locally.

Important Landscape Features:

- The Lower Carron /Bonny Water valley covers a wide swathe of the central Falkirk Council area, between main built up areas with a complexity and variety of land uses including major communication routes;
- Its character is largely influenced by the surrounding urban and industrial land uses which may combine to reduce the impact of new turbines;
- Urban and industrial influences have less of an impact on the character of the River Carron valley east of Denny where mixed farming, woodland and tree belts provide an attractive, more intimate valley landscape with confined views northwards into the wooded hill fringes. Here turbines would affect the appreciation of the intimate scale of the landscape and could not be physically accommodated on the steep slopes and in the valley bottom. Turbines would diminish the perception of containment and depth of the valley if located within or on the valley tops;
- Turbines which affect views from the Falkirk Wheel 'important' viewpoint and other key views could create significant visual impact. In particular, the Bonny Water corridor to the south of the area lies almost completely within the Antonine Wall World Heritage Site buffer which is designed to protect the landscape setting of the World Heritage Site, where wind energy development other than small single turbines could create significant visual impact.

Cumulative Impacts:

- There are cumulative impacts in relation to infrastructure and other existing and proposed development. If it was considered that the addition of new development would breach the threshold or 'tipping point' of landscape change, the Council would need to consider whether the resulting landscape, visual and cumulative effects would be acceptable, particularly where sited close to residential property.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable where it relates well to the existing landscape in terms of scale and design, and where it relates well to existing buildings in terms of scale and location.

Turbines over 50m to tip: Larger turbines are unlikely to be acceptable.

Capacity within Local Landscape Character Area 4(v) Falkirk - Grangemouth Urban Fringe

Capacity for Wind Energy Development: **Moderate**

Main Landscape Objective: Landscape protection is required in those areas where views or the setting of the Antonine Wall could be affected. In other areas suitably designed wind turbine groups which generally fit within the landscape could potentially be accommodated even though they may have an impact on the urban fringe landscape locally.

Important Landscape Features:

- A relatively narrow, flat open valley between Falkirk and Grangemouth, its character is heavily influenced by adjacent industrialisation, other built development and major communication routes. At the northern end the area widens out where the River Carron meets the Forth & Clyde Canal, providing landscape interest including the location of Helix Park and the Kelpies, which is an important visitor attraction;
- The area lies within views from many residential properties in the urban fringe;
- Some wind energy development within the urban fringe may be appropriate where it is in keeping with the character of the landscape, where existing transport routes, associated infrastructure and other development may combine to reduce the impact of new turbines.

Cumulative Impacts:

- There are cumulative impacts in relation to infrastructure and other existing and proposed development. If it was considered that the addition of new development would breach the threshold or 'tipping point' of landscape change, the Council would need to consider whether the resulting landscape, visual and cumulative effects would be acceptable, particularly where sited close to residential property.

Turbines of less than 50m to tip: Small scale development less than 20m in height may be acceptable where it relates well to the existing landscape in terms of scale and design, and where it relates well to existing buildings in terms of scale and location, as well as avoiding impact on the Antonine Wall World Heritage Site and its setting.

Turbines over 50m to tip: Larger turbines are unlikely to be acceptable.

Capacity within Local Landscape Character Area 5(i) Manuel Farmlands

Capacity for Wind Energy Development: Low - Moderate

Main Landscape Objective: Landscape protection from wind energy development.

Important Landscape Features:

- The Manuel Farmlands is a small-medium scale, smoothly rolling landscape, with a variety of landuses, some a legacy of previous minerals working, with surrounding farmland and isolated estate houses with policy woodlands. The semi-complex character due to the fragmented pattern of land uses would suggest that some wind energy development could be accommodated, but impacts on key visual criteria would need to be carefully considered;
- Turbines located on prominent ridges or which affect views from the 'important' viewpoint at Cockleroy in West Lothian or sensitive routes to the Bathgate Hills or the Forth, or from/to the Antonine Wall, could create significant visual impact.

Cumulative Impacts:

- The Landscape Capacity Study identified the Strategic Growth Area at Whitecross as a significant sensitive receptor and driver of change in the LCA. Whilst this is reduced in scale since the study, there are new development sites which will require consideration as sensitive receptors in terms of visual and community impacts.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable where it relates well to the existing landscape in terms of scale and design, and where it relates well to existing buildings in terms of scale and location.

Turbines over 50m to tip: Larger turbines are unlikely to be acceptable.

Capacity within Local Landscape Character Area 5(ii) Bo'ness Coastal Hills

Capacity for Wind Energy Development: **Low - Moderate**

Main Landscape Objective: Landscape protection should be the objective to maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity.

Important Landscape Features:

- Views from 'important' viewpoints at the House of Binns Tower and Cockleroy in West Lothian, and from sensitive routes cover significant parts of the area. These include popular walking routes including the John Muir Way;
- There are important 'iconic' views from Blackness Castle across the eastern part of the Bo'ness Coastal Hills where wind energy development would be inappropriate;
- Prominent ridges are important to intervisibility where wind turbines would be particularly visible;
- There are important views from the Bo'ness Coastal Hills to the Bathgate Hills and across the Firth of Forth to the Ochil Hills beyond the Falkirk Council boundary, where wind turbines would be harmful to the setting and landscape context of the landscape character area;
- The northern part of the landscape character area has a strong visual relationship with the Antonine Wall World Heritage Site (WHS) with views to and from the WHS where development has the potential to affect the setting of the Wall.
- Turbines would contrast with the settled nature and scale of the landscape. When seen in views of features in the distance they could intrude on the composition and affect the perception of distance;
- Despite proximity to the Forth there is not a strong horizontal emphasis to the area due to the undulating hills which provide great contrast in views and limit scale to medium. Large turbines would affect openness when viewed against the coast and would not fit with the scale and semi-open character.

Cumulative Impacts:

- There is the potential for 'in combination', 'in succession' and/or 'sequential' cumulative effects from locations within the Bo'ness Coastal Hills and when travelling through adjacent character areas which could create the perception of a landscape dominated by wind turbines where the landscape, and in particular visual sensitivity, is unable to accept such a level of change.
- Potential cumulative effects of new development seen within views of the existing turbines at Muirhouse will need careful assessment. The six 20m tall operational turbines within farmland at Muirhouse lie within the Bo'ness Coastal Hills. These generally relate well to the existing simple pattern of the landscape in terms of location, scale and design. Any similar turbine development must relate to the field pattern and maintain separation to avoid cumulative impacts.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable where it relates well to the existing landscape in terms of scale and design, and where it relates well to existing buildings in terms of scale and location.

Turbines over 50m to tip: Larger turbines are unlikely to be acceptable.

Capacity within Local Landscape Character Area 5(iii) Grangemouth/Kinneil Flats

Capacity for Wind Energy Development: Moderate - High

Main Landscape Objective: Landscape accommodation or landscape change is the most appropriate objective where the landscape could become a landscape with some wind energy development.

Important Landscape Features:

- The character area occupies the flat reclaimed saltmarsh between Grangemouth and Bo'ness. Despite being largely open, it has a unique, developed coastal character due to the presence of the petrochemical works, docks and other industrial installations on the wide, expansive, large scale coastal flats alongside the Forth.

Cumulative Impacts:

- There is likely to be a complex cumulative assessment in combination with the existing industrial development. Visual impacts from settlements in conjunction with this is likely to be important.

Turbines of less than 50m to tip: Small scale development of less than 50m in height is could appear trivial and out of scale in the context of nearby industry.

Turbines over 50m to tip: Large turbines taller than 100m could relate visually to the vertical nature of the industrial development nearby. Blade movement could have a visual relationship with the movement of flames, steam and other outputs from the oil refinery and chemical works.

Capacity within Local Landscape Character Area 6(i) Skinflats

Capacity for Wind Energy Development: **Moderate**

Main Landscape Objective: Landscape protection is required in those areas where the objective is to maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity. In other areas suitably designed wind turbine groups which generally fit within the landscape could potentially be accommodated even though they may have an impact on the urban fringe landscape locally.

Important Landscape Features:

- Key landscape characteristics are the large scale, open, flat and very low lying, and horizontal coastal margin. The scale and character of the coastal landscape would suggest that larger turbines and groups could be an appropriate fit. However, the Skinflats are highly sensitive visually with extensive views of the Forth and to the Ochil Hills beyond from sensitive transport corridors and other amenity routes;
- The setting of the character area and in particular the contrast between the flat open coastal margins and the distinctive landmark hills is especially sensitive. Turbines could interrupt the strong horizon of the Forth and views of the long horizontal form of the Ochils, and it is important that turbines do not detract from these key characteristics;
- There is a relatively narrow visual cone from the 'important' viewpoint at Airth Castle where wind energy development would be inappropriate where the character of the landscape and visual amenity was adversely affected.

Cumulative Impacts:

- There are close views of existing power lines and pylons which appear as incongruous vertical features into this characteristically flat landscape. Turbines could create visual confusion with the dominant foci of pylons, and would accentuate the visual impact. Even small turbines could appear out of scale with the wide open landscape, where fields are large and skies are huge.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable where it relates well to the existing landscape in terms of scale and design, and where it relates well to existing buildings in terms of scale and location.

Turbines over 50m to tip: The larger wind turbine typology heights above 50m are unlikely to be acceptable.

Capacity within Local Landscape Character Area 6(ii) Carse of Forth

Capacity for Wind Energy Development: **Moderate**

Main Landscape Objective: Landscape protection is required in those areas where the objective is to maintain the existing landscape character and visual resource, to retain or reinforce its present character and protect its quality and integrity. In other areas suitably designed wind turbine groups which generally fit within the landscape could potentially be accommodated even though they may have an impact on the urban fringe landscape locally.

Important Landscape Features:

- Key landscape characteristics are the large scale, open, flat and very low lying, and horizontal coastal margin. The scale and character of the coastal landscape would suggest that larger turbines and groups could be an appropriate fit. However, the Carse of Forth is highly sensitive visually with extensive views of the Forth and to the Ochil Hills beyond from sensitive transport corridors and other amenity routes;
- The setting of the character area and in particular the contrast between the flat open coastal margins and the distinctive landmark hills is especially sensitive. Turbines could interrupt the strong horizon of the Forth and views of the long horizontal form of the Ochils, and it is important that turbines do not detract from these key characteristics;
- There is a relatively narrow visual cone from the 'important' viewpoint at Airth Castle where wind energy development would be inappropriate where the character of the landscape and visual amenity was adversely affected.

Cumulative Impacts:

- There are close views of existing power lines and pylons which appear as incongruous vertical features into this characteristically flat landscape. Turbines could create visual confusion with the dominant foci of pylons, and would accentuate the visual impact. Even small turbines could appear out of scale with the wide open landscape, where fields are large and skies are huge.

Turbines of less than 50m to tip: Small scale development less than 50m in height may be acceptable where it relates well to the existing landscape in terms of scale and design, and where it relates well to existing buildings in terms of scale and location.

Turbines over 50m to tip: The larger wind turbine typology heights above 50m are unlikely to be acceptable.

Appendix 4 : Energy Statement Template

Click Here for Link to Appendix 4 : Energy Statement Template pdf

Completion of this template demonstrates compliance with LDP policy by showing detail of renewable and low carbon technologies integrated into development. It should be updated at two stages in the planning application process.

Stage 1 – Application Assessment: Stage 1 is designed to assist applicants to set out their intentions to incorporate low carbon and renewable energy within their development, in the form of decentralised heat networks and low and zero-carbon technologies. This allows applicants to highlight how they considered the most appropriate technologies. Implementation will be addressed through planning conditions which form part of the consent.

Stage 2 – Condition Purification (Post Approval): Stage 2 sets out the percentage reduction in CO_2 emissions required by policy IR13 'Low and Zero Carbon Development' of the Falkirk Council LDP, in order to purify planning conditions. This stage should be completed by a registered SAP assessor (for domestic) or Low Carbon Energy Assessor (for non-domestic).

Application Reference Number (if known)

Location of Development

Name of Applicant

Name of Agent (if relevant)

Description of Development

STAGE 1: Application Validation

Low and Zero-Carbon generating technologies

What LZCGT technologies do you propose to implement in your development?

Photovoltaics		Solar thermal		Geothermal heat	
Wind Energy		Air Source Heat Pump		Biomass	
Hydro		Ground Source Heat Pump		Combined Heat and Power (CHP)	
Energy Storage		Water Source Heat Pump		Heat exchange and recovery	
Other (please state)					

Please provide a description of how you propose to integrate LZCGT into the development. This information should include: Size of scheme, approximate projected CO_2 savings, location of technology within the site, and in relation to other buildings or sensitive receptors on-site (such as ecological sites or historic buildings).

Decentralised Heat

Is there any existing or proposed heat network in the area (within 500m of site boundary)?	Yes/No
Will the development provide a link to an existing network?	Yes/No
Will the development install its own heat network?	Yes/No

Energy source: Please provide details of the overall baseline energy requirements of the site and how heat will be delivered. Explain how the choice of fuel for the development was arrived at.

Site constraints: Set out details of the proposed decentralised energy scheme (you may wish to refer to additional supporting information). Identify the scope and nature of any physical constraints which may impact the ability to deliver a heat network and infrastructure within the development. Section 3 of the SG provides more detail on the type of constraints which may affect development.

Financial viability: Where a decentralised heat network is not proposed, explain how the viability of the project would be affected by the installation of decentralised energy network infrastructure. Section 2 of the SG provides more detail but this will include:

- The cost of pipe infrastructure (per metre) and the cost of any energy centre for the whole energy requirement of the site; and
- Any other significant upfront development and infrastructure costs, or adverse level of financial risk associated with the development.
- Demonstration that additional sources of funding (see Section 4 of the SG) for decentralised energy have been explored.

Electric Vehicle Infrastructure

Please confirm that the development will incorporate EV charging connection points in line with Section 4 in the SG.

Yes ☐

No ☐ (Explain any technical or viability issues which would prevent the installation of EV charging infrastructure)

STAGE 2: Condition Purification (Post Approval)

Using the Standard Assessment Procedure Energy Rating (SAP) for dwellings and the Simplified Building Energy Model (SBEM) for all other developments, please supply the following:

1	The Target Emissions Rate (TER), which is an output from the SAP/SBEM calculation	
2	The Dwelling or Building Emissions Rate (DER/BER), which is the predicted CO_2 emissions for the actual proposal, which includes the low and zero carbon generating technology (LZCGT)	
3	Re-calculation of the DER/BER excluding any low and zero carbon generating technologies	
4	The percentage reduction in carbon due to renewables: [(Step 1 - (Step 2 ÷ Step 3)) x100]	

Name of SAP/LCEA assessor	
Name of SAP/LCEA assessor company	
Regulator registration details	