

**Sunderland
City Council**



South Tyneside Council

Wind Energy Evidence Paper: Draft International Advanced Manufacturing Park Area Action Plan (2024 to 2042)

June 2024

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1. Introduction

- 1.1. The International Advanced Manufacturing Park (IAMP) is large employment park of regional and national significance, located within the administrative areas of Sunderland and South Tyneside. The policy framework for the AAP currently comprises of the IAMP Area Action Plan (AAP), which was adopted by both Councils in November 2017.
- 1.2. In order to support the ongoing development of the IAMP and to align to the recently announced North East Investment Zone proposals, a new AAP is being prepared which proposes to allocate an additional 75ha of land for development and extend the AAP boundary area.
- 1.3. The current AAP does not identify any areas as suitable for wind energy development, and at this point in time it is not possible to support any proposals for new wind energy development within the area due to national policy restrictions. The preparation of a new AAP for the area, provides the opportunity to identify suitable locations.
- 1.4. The IAMP will contain a number of significant energy users, which may benefit from the installation of wind turbines locally to assist in meeting their energy demands. In addition, Sunderland City Council and South Tyneside Council (“the Councils”) are committed to reducing carbon emissions as part of climate change action, as set out within their respective strategies¹, and planning policy has a key role to play in these efforts including through supporting increases in renewable energy production and use. It is therefore important that the AAP provides a policy context for IAMP businesses to generate their own clean energy supply. This includes the identification of potentially suitable areas for wind turbine development. Policy I2: Wind Energy of the Draft International Advanced Manufacturing Park Area Action Plan (2024 to 2042) has been prepared to help address this need.
- 1.5. The purpose of this Evidence Paper is to identify whether there are any potentially suitable areas of land for wind turbine development within the proposed IAMP AAP boundary, in support of draft Policy I2. This has been determined by applying a high-level methodology which will discount unsuitable areas of land on the basis of a range of planning and environmental considerations, together with the use of buffer distances where appropriate (for example, for safety reasons).

¹ Sunderland Low Carbon Framework and Action Plan, and Sustainable South Tyneside – Moving Towards a Carbon Neutral Future.

2. Policy Context

- 2.1. National planning policy stipulates that applications for wind energy development involving one or more turbines should not be considered acceptable unless it is in an area identified as suitable for wind energy development in the development plan or a supplementary planning document; and, following consultation, it can be demonstrated that the planning impacts identified by the affected local community have been appropriately addressed and the proposal has community support².
- 2.2. The Government's Planning Practice Guidance (PPG) indicates that there are no hard and fast rules about how suitable areas for renewable energy should be identified, but in considering locations, local planning authorities will need to ensure they consider the requirements of the technology and, critically, the potential impacts on the local environment, including from cumulative impacts. The PPG identifies the following considerations for the siting of wind turbines: technical (wind resource, air safeguarding, electromagnetic interference and access), safety, landscape and visual, historic environment, local amenity including noise and shadow flicker, and ecology.

² National Planning Policy Framework, December 2023: footnote 58

3. Existing Evidence

- 3.1. Sunderland City Council has previously undertaken an exercise to identify potentially suitable areas for wind turbine development across Sunderland's jurisdiction, excluding the existing IAMP AAP area, as part of the now revoked Draft Allocations and Designations Plan.
- 3.2. The methodology used for that exercise detailed how potentially suitable areas for four different scales of wind turbine were identified. This was principally achieved through a GIS constraints mapping exercise, whereby areas were excluded from potential suitability on the basis of a range of planning and environmental considerations, together with the use of buffer distances where appropriate (for example, for safety reasons). Whilst the Draft A&D Plan has now been revoked, it is considered that the methodology used in identifying potential suitable locations for wind turbines remains an appropriate starting point.
- 3.3. South Tyneside Council has recently consulted on its Publication draft Local Plan (Regulation 19). Policy 6: Renewables and Low Carbon Energy Generation of this Plan seeks to identify areas potentially suitable for new wind energy development across South Tyneside's jurisdiction, again excluding the IAMP AAP area. These areas are shown on Map 15 of the Plan, indicated on the basis of the lowest scale of turbine height category. The evidence for Policy 6 is set out within the [South Tyneside Wind Development Study \(2022\)](#).
- 3.4. The South Tyneside Wind Development Study employs a methodology which is very similar to that employed in Sunderland. This includes the categorisation of turbines into four height ranges together with a constraint mapping exercise (with buffer distances where appropriate) for each range. It is notable however that the two methodologies treat Green Belt differently; in Sunderland, Green Belt is not used as a constraint across all height ranges, whereas in South Tyneside, Green Belt is used as a constraint across all heights (and as such no potentially suitable sites are identified within South Tyneside's Green Belt).
- 3.5. As the AAP will cover parts of the administrative areas of both Sunderland and South Tyneside it is therefore necessary for a bespoke approach to be taken, based on the approaches adopted by each Council.

4. Methodology: summary

4.1. The identification of potentially suitable areas for wind energy development within the Proposed IAMP AAP Area has been arrived at through a methodology which has involved the following considerations and processes:

- Classification of wind turbine heights into four categories
- Wind speed
- Constraints exclusion (and use of buffering distances where appropriate)

4.2. The methodology has produced potentially suitable areas in respect of the four height categories. Maps for these four heights categories are provided as Figures 2-5 in Section 8 below. Figure 6 in Section 9 below shows these areas at their broadest range; this Figure is to be Appended to the AAP.

4.3. The methodology's results should be regarded as a high-level assessment of the extent and distribution of planning and environmental constraints that affect the suitability of areas for onshore wind turbines of different heights within the study area. It is stressed that the identification of suitable areas is a high-level process for the purposes of supporting draft Policy I2, and is therefore without prejudice to the consideration of individual planning applications within these locations, which will be treated on their individual merits.

5. Methodology: Classification of wind turbine heights

5.1. Wind turbines are rated according to their maximum electrical output in kilowatts (kW) or megawatts (MW). Electricity production is measured in kilowatt hours (kWh) or megawatt hours (MWh). There are no industry established wind turbine size ranges/categories. For the purposes of this methodology however, given that the impacts associated with such development are directly correlated with their size (blade/tip height), and that a wide range of heights and outputs are available in order to fulfil different purposes, it is appropriate to classify turbines into four size (blade/tip height) ranges.

Wind Turbine Blade/Tip Height Range Name	Wind Turbine Height Ranges used in this Methodology	Mid-point height used in this Methodology
Small	11 – 30m	20m
Small-medium	31 – 50m	40m
Medium	51 – 100m	75m
Large	100m +	115m

TABLE 1: WIND TURBINE HEIGHT RANGES

5.2. The grouping of turbines into height categories in turn enables a constraint (and buffer) GIS mapping exercise to be undertaken, with distances therein calculated on the basis of a mid-point height within each range. For the purposes of large 100m+ turbines, a height of 115m has been used. This is a suitable approach for the purposes of this high-level assessment; when dealing with individual proposals, the actual blade/tip height should be applied for any such calculations.

5.3. This methodology excludes 'micro' wind turbines, of which are categorised as less than 11m height, on the basis that this very smallest scale of turbine is unlikely to be of interest or suitability for IAMP businesses, given their limited output.

6. Methodology: Wind speed

- 6.1. For a wind turbine to be economically viable and deliver meaningful carbon emission savings, it must be sited in a location where the wind speed is sufficient to rotate the rotary blades. The electricity generated by a site is directly affected by the wind speed. Turbines typically work best in more exposed locations, without turbulence cause by obstacles such as trees or buildings.
- 6.2. Planning practice guidance does not prescribe wind speed minimums to apply in the assessment of potential locations for wind turbine development. The Department of Energy and Climate Change produced a methodology in 2010³ which recommended applying a lower limit of 5m/s measured at 45m above ground level to ensure sufficient wind speeds and baseline turbine scheme feasibility. The Numerical Objective Analysis Boundary Layer (NOABL) Wind Speed Database,⁴ is a free resource that provides estimated wind speeds at 10, 20 45 metres above ground level, across 1 km² areas within the UK.
- 6.3. Figure 1 presents a screenshot from the NOABL Wind Speed at 45m Map. The orange areas have a reading of >6m/s, the red areas >7m/s and the purple areas >8m/s. As such, this demonstrates that the 5m/s wind speed lower limit is observed across the proposed IAMP AAP boundary. Whilst there can be expected to be some seasonal variability within these estimated figures, the data indicates that there are no areas which warrant exclusion through this methodology on the basis of wind speed. Ultimately, whether sufficient speeds are present on any individual site will be a matter for a business to investigate through on-site measurements as part of their pre-application feasibility work in respect of a specific proposal.



FIGURE 1: NOABL WIND SPEEDS AT 45M MAP

³ DECC Renewable and Low-carbon Energy Capacity Methodology: Methodology for English Regions. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/226175/renewable_and_low_carbon_energy_capacity_methodology_jan2010.pdf

⁴ <https://www.rensmart.com/Maps#NOABL>

7. Methodology: Constraints mapping

- 7.1. The location, scale and design of onshore wind turbines, as structures of significant scale, is such that it is a form of development that needs to be carefully managed and is therefore to be restricted by a wide range of factors. At the forefront of these constraints is the need for an understanding of the character and sensitivity of the landscape of the study area, given the potential for turbines to have significant impacts in these terms.
- 7.2. In addition to landscape and visual considerations, i.e. protection of areas of greater landscape value, there is an extensive list of designations, infrastructure, other land uses and additional constraints which can be readily mapped using GIS. Many of these constraints require a reasonable buffer zone for safety or other reasons; such buffers are calculated with reference to the mid-point heights in Table 1.
- 7.3. The list of constraints used (as set out in Table 2) are similar to those used in Sunderland and South Tyneside's methodologies. Many of these constraints are not applicable to the proposed IAMP AAP study area (as opposed to the authority-wide jurisdictions covered by the previous assessments), however for completeness, all those applied to the constraint mapping process are set out below.
- 7.4. In order to reflect South Tyneside's approach of applying Green Belt as a constraint across all turbine heights, this has been added as a constraint in the same manner. The exclusion of Green Belt land within the IAMP AAP area is deemed appropriate given that this area is identified for protection and enhancement as a green infrastructure corridor.
- 7.5. The outcome of the constraint mapping exercise is that maps are generated for each turbine height category showing those areas of land not covered by any of the constraints (and buffers where appropriate).
- 7.6. It is recognised that mapping data in GIS has technical limitations and that site-specific investigations may be needed to examine particular factors that are not able to be considered through this high-level process. As such, the identification of a parcel of land as appropriate for wind turbine development of one of more height categories through this method is intended as a general guide to potential business/developers, and so provides no guarantee over its ultimate suitability for development. An assessment of the key issues/impacts as set out in draft Policy I2 will need to be undertaken in relation to any specific proposal.
- 7.7. In applying buffer distances to some of the constraints, consideration has been given to the PPG which advises that local planning authorities should not rule out otherwise acceptable renewable energy developments through inflexible rules on buffer zones or separation distances. Other than when dealing with setback distances for safety, distance itself does not necessarily determine whether the impact of a proposal is unacceptable. Distance plays a part, but so does the local

context including factors such as topography, the local environment and near-by land uses.

7.8. Table 2 below provides details of the constraint, mapped feature exclusion and justification.

Constraint	Mapped feature exclusion details	Justification
Green Belt	Feature boundary only	Both the existing and proposed IAMP AAP boundaries retain a central swathe of Green Belt, with employment land allocations to the north and south. This retained Green Belt adjoins further Green Belt to the east and west and forms part of a wider green infrastructure corridor. As the policies of the AAP seek to protect this area as a green infrastructure corridor, this area has been excluded.
Landscape designations	<p>Figure 3.2: Landscape Strategy of Sunderland Landscape Character Assessment (2015): Areas identified for Landscape Protection or Landscape Protection and Enhancement</p> <p>Areas not identified as potentially suitable in South Tyneside Landscape Character Study Part 3: Application of the Character Assessment</p>	<p>Sunderland's Core Strategy and Development Plan Policies NE9, NE10 and WWE1 seek to avoid unacceptable significant adverse impacts of development on landscape. Landscape protection means actions to conserve and maintain the significant or characteristic features of those area of higher landscape value.</p> <p>Reflects recommendations in the South Tyneside Landscape Character Study Part 3.</p>
Motorways, trunk roads, railways and safeguarded rail alignment for potential future reopening and metro expansion (Leamside Line and South Hylton-Penshaw)	1.5x turbine mid-point height from feature	Reflects Department of Transport and National Highways guidance taking into consideration the potential consequences of toppling and debris scatter to nationally important infrastructure.
A and B roads (local road network)	1.1x turbine mid-point height from feature	Reflects fall-over distance plus small buffer taking into consideration the potential local consequences of toppling and debris scatter.

Constraint	Mapped feature exclusion details	Justification
Public rights of way (bridleways & footpaths) and council designated multi-user routes	1.5x turbine mid-point height from feature	There is no statutory separation distance or guidance issued citing best practice for separation distances from public rights of way. 1.5x is appropriate to allow for safety, intimidation, and animal welfare concerns.
High voltage power lines	1.1x turbine mid-point height from feature	Reflects the utility provider recommendation. Toppling distance and wake effects need to be taken into consideration. Whilst wind turbine toppling is a low risk, the potential siting of a turbine could cause effects to high voltage power infrastructures. Wake downwind of a turbine affects wind speeds and can have significant impacts on overhead line conductors if not considered fully, potentially causing levels of motion and in extreme cases, conductor clashing.
High pressure gas pipelines	1.5x turbine mid-point height from feature	Reflects the utility provider recommendation.
Residential land uses	4x turbine mid-point height from address point	Distance is based upon previous planning decisions in Sunderland and South Tyneside alongside the approaches taken by other local planning authorities. Large moving structures that are in close proximity to a residential property can be overbearing or oppressive and may render a property an unattractive place to live and this will be a material planning consideration. Adverse impact may be in respect of noise, shadow flicker and visual dominance. Buffer applied at each address point for existing development, or from the boundary of planned housing development.
Watercourses	Rivers and waterbodies, including a 50m buffer	Exclusion of all rivers and waterbodies as a physical constraint, in the interests of avoidance of adverse impacts upon hydrology and ecology both during construction process during operational phase.
Protected wildlife and geological sites (international, national and local)	Site boundary only	European protected sites including Special Protection Areas and Special Areas of Conservation and Ramsar; nationally designated sites including Sites of Special Scientific Interest and Local Nature

Constraint	Mapped feature exclusion details	Justification
		Reserves; Local Wildlife Sites and Local Geological Sites all excluded in recognition of their nature conservation value.
Historic environment assets: Scheduled Ancient Monuments Historic Parks and Gardens	Site boundary only	Sunderland CSDP Policy WWE1, draft IAMP AAP Policy D1, South Tyneside Local Development Framework Policy DM6 and South Tyneside Publication draft Local Plan Policies SP24 and 44 together with NPPF chapter 16 provide protection for heritage assets. Wind turbine development within these sites would give rise to significant adverse impacts and is therefore inappropriate. Buffer not required as impacts upon setting would be a matter for detailed assessment at application stage. NB Listed buildings are not mapped as a constraint as an effect on their setting is a matter for detailed assessment.
Outdoor sports facilities, parks, cemeteries and church grounds	Site boundary only: Sunderland Greenspace Audit 2020 and Annex 1 Open Space Review to South Tyneside Wind Development Study 2022	Wind turbine development would be incompatible with these sites/land use/environment
Other – North Pier and Marina (Sunderland)	Site boundary only	Wind turbine development would be incompatible with these sites/land use/environment

TABLE 2: CONSTRAINTS MAPPING

7.9. Additional constraint considerations:

Newcastle Airport

7.9.1. Wind turbines may have an adverse effect on air traffic movement and safety. Firstly, they may represent a risk of collision with low flying aircraft and secondly, they may interfere with the proper operation of radar by limiting the capacity to handle air traffic and aircraft instrument landing systems. There is a 15 kilometre (km) consultation zone and 30km or 32km advisory zone around every civilian air traffic radar, although objections can be raised to developments that lie beyond the 32km advisory zone.

7.9.2. A 30km advisory zone provides full coverage of the proposed IAMP AAP area. The requirement for Newcastle Airport consultation is not a prohibition to wind turbine development per se, but a necessity to ensure avoidance of adverse impacts on air traffic movement and safety and radar operations.

Protected species

7.9.3. Protected species are not mapped as comprehensive data is unavailable and the specific consequences on such for any proposed development would be a matter for detailed assessment as part of any planning application.

8. Results

- 8.1. Applying the methodology outlined within this paper has identified a range of potentially suitable areas for wind energy development of different height ranges across the proposed IAMP AAP area. These areas are highlighted on Figures 2-5 below. Further detail is available on the draft IAMP AAP interactive Policies Map published on the Council's webpage.
- 8.2. The identification of potentially suitable areas in this report does not provide a definitive assessment of the suitability of a particular location for wind turbines of a particular scale; any proposals for wind turbine development in these areas would require more detailed assessment to inform and assess the acceptability of a proposal. This would include a range of issues, including those matters that this report has indicated would need to be considered as part of a more detailed site appraisal and a more detailed consideration of some of the matters included in this study. It is, therefore, recommended that the identification of potentially suitable areas for wind energy development with the IAMP AAP is accompanied by policy criteria to support an assessment of the individual merits of any such proposal.
- 8.3. The areas identified are locations with potential suitability as a result of the approach set out within this paper. An area's identification does not indicate that wind energy development will be built in this location, nor does it pre-determine the decision of any planning application.

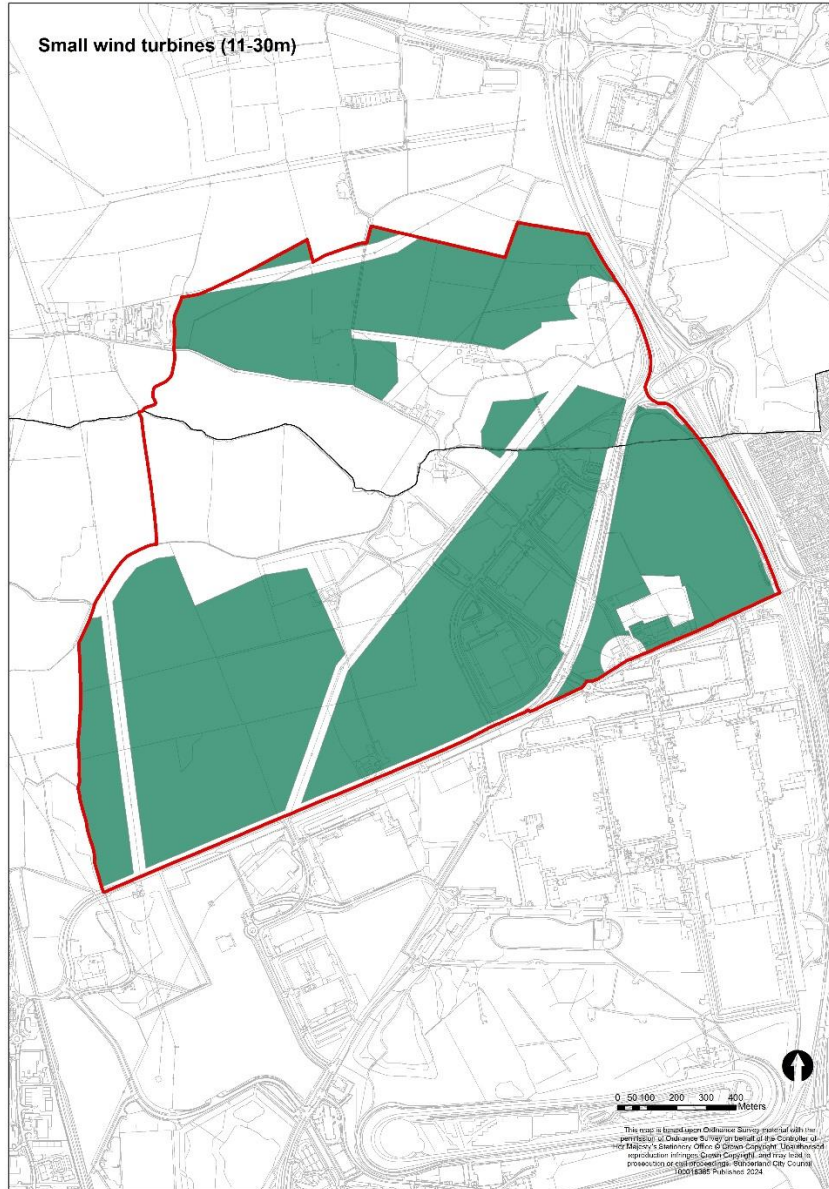


FIGURE 2: AREAS POTENTIALLY SUITABLE FOR SMALL SCALE WIND ENERGY DEVELOPMENT

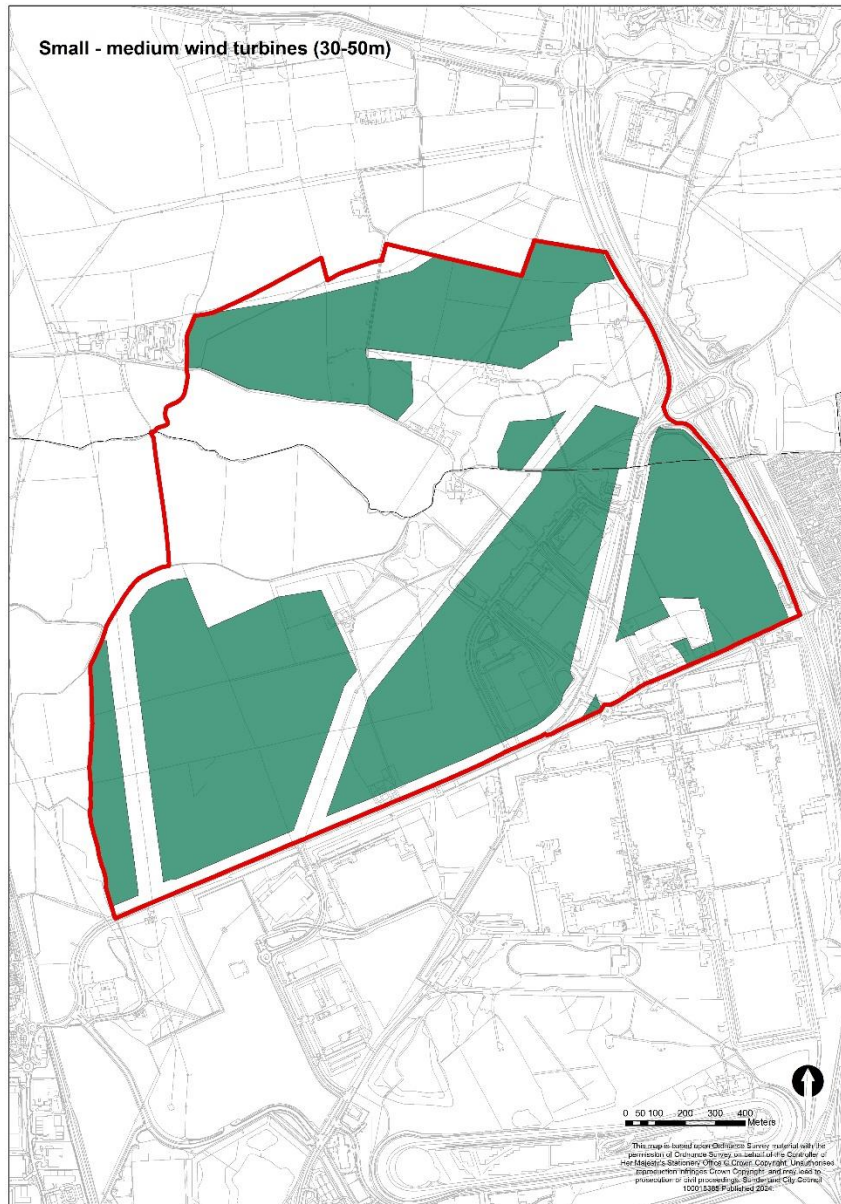


Figure 3: Areas potentially suitable for small-medium scale wind energy development

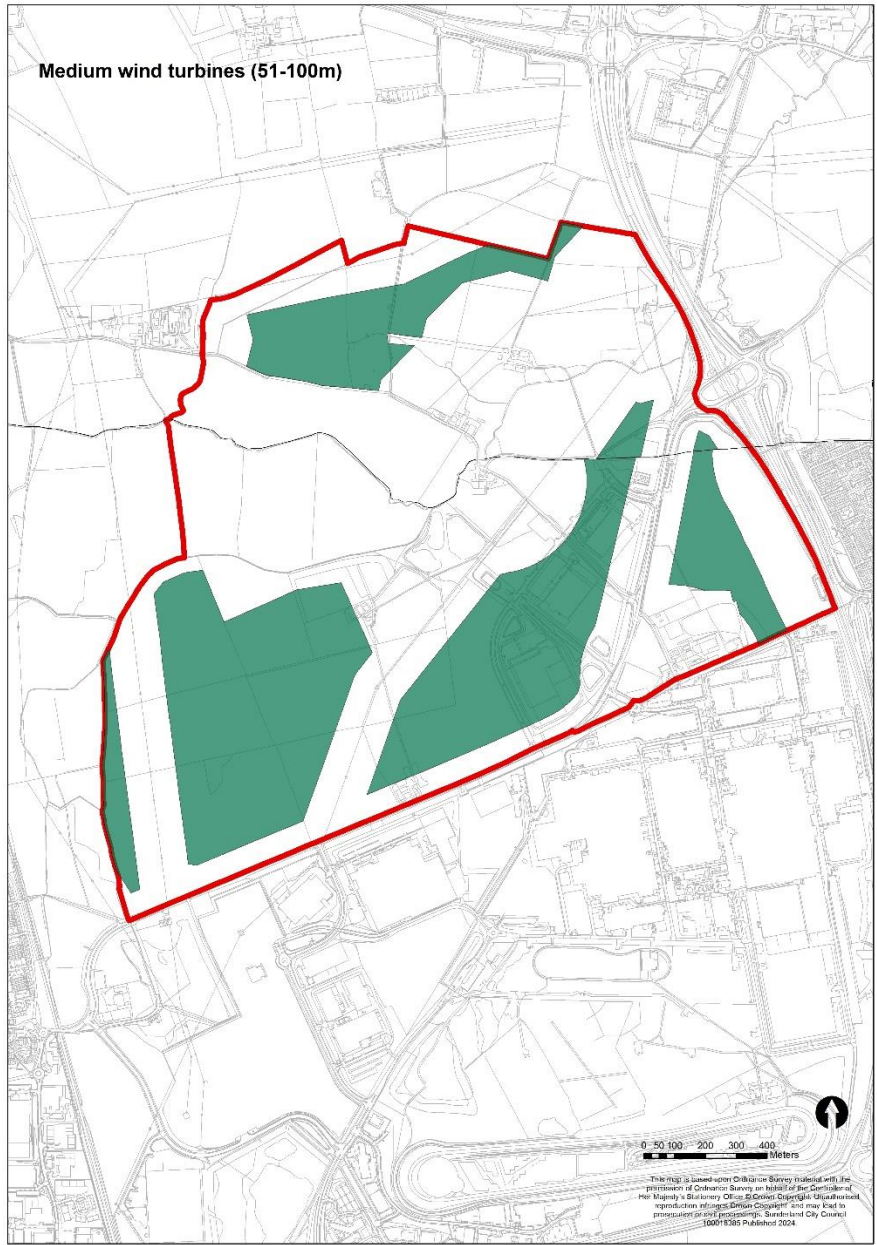


Figure 4: Areas potentially suitable for medium scale wind energy development

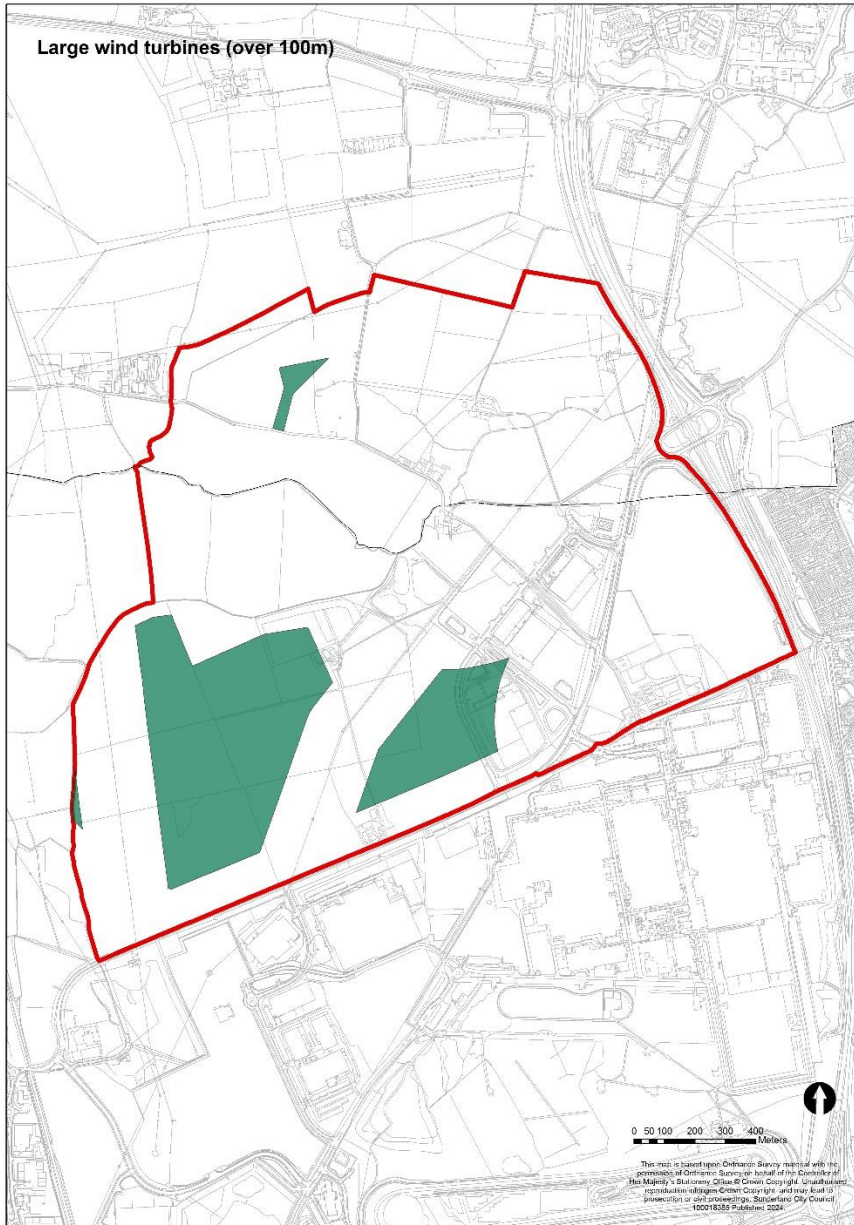


Figure 5: Areas potentially suitable for large scale wind energy development

9. Conclusion

- 9.1. This report has identified potentially suitable areas for wind energy development with the proposed IAMP AAP area. It is therefore recommended that AAP draft Policy I2 includes Figure 6 below, which shows these areas at their broadest range. This reflects the approach taken in the South Tyneside Publication draft Local Plan. Applicants should then be directed to Sections 4-8 of this report for guidance on turbine height ranges together with associated mapping of potentially suitable areas for each height category.
- 9.2. The potentially suitable areas identified are the results of the high-level methodology detailed within this report and as such are not intended to provide a definitive assessment of the suitability of a particular location for wind turbines of a particular scale. Wind energy proposals in these areas would require more detailed assessment at site specific level to inform and assess their acceptability with reference to a range of considerations, and as such AAP draft Policy I2 should include policy criteria to support decision-making on their individual merits.
- 9.3. An area's identification does not indicate that wind energy development will be built in this location, nor does it pre-determine the decision of any planning application.

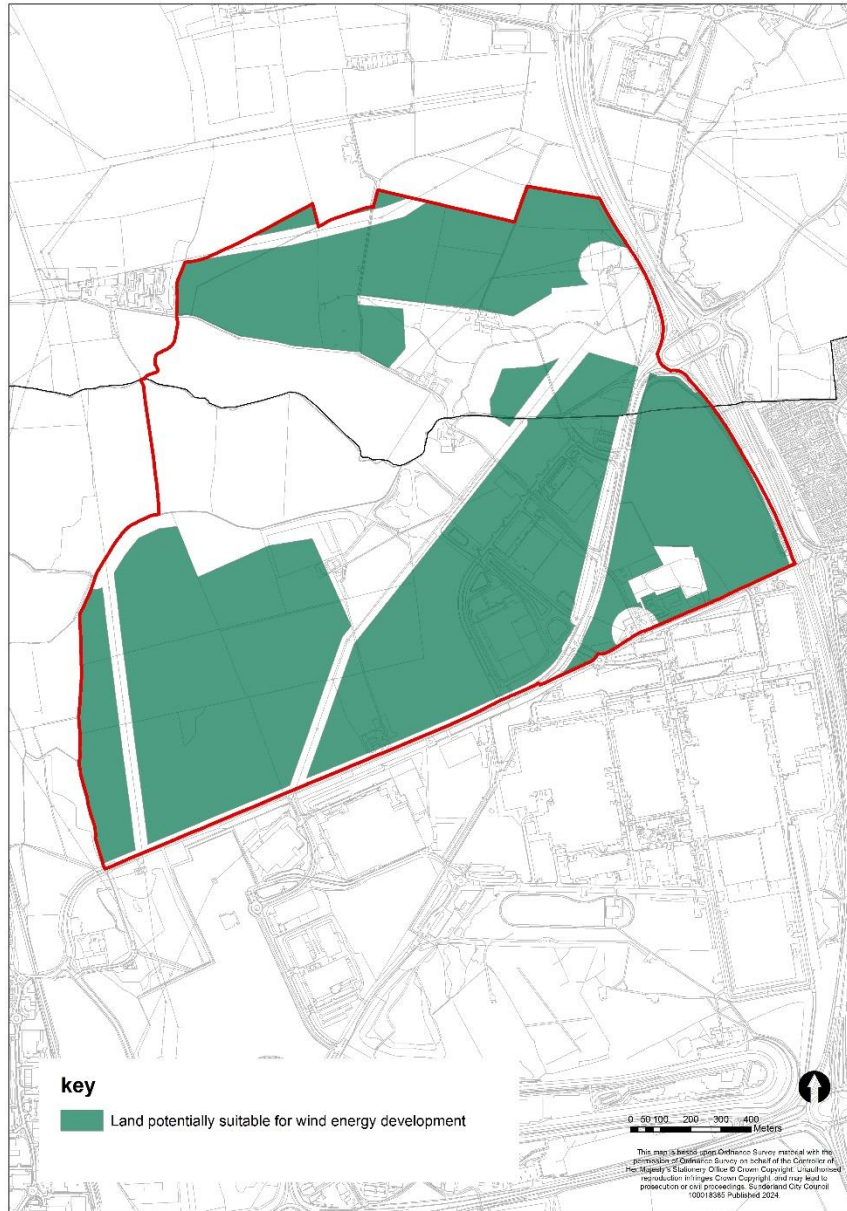


Figure 6: Areas potentially suitable for wind energy development