MAGHERAMORE WIND FARM

Design & Access Statement

MANAGEMENT SYSTEM CERTIFICATION
ISO 9001 = ISO 14001 = OHSAS 18001
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Introduction

The Proposed Development

1. This Design and Access Statement has been prepared by RES Ltd in support of a full planning application for Magheramore Wind Farm, hereinafter referred to as the Development, located approximately 4 km to the south of Dungiven, Co Derry/Londonderry. Please see **Figure 1.1: Site Location.**

2. The Development comprises 6 three-bladed, horizontal axis wind turbines, each up to a maximum of 149.9 m to tip height, with a total installed capacity of up to 21.6 MW. The Development would include a newly created site entrance, access tracks, crane hardstandings, control building and substation compound, electricity transformers, underground cabling, energy storage containers and drainage works. During construction and commissioning there will be a number of temporary works including enabling works compound and construction compound with car parking, temporary parts of crane hardstanding, welfare facilities and off-site road widenings into 3rd party lands on the Banagher, Carnanbane and Magheramore roads.

3. The proposed development is shown in **Figure 2.1: Infrastructure Layout.**

The Applicant

4. RES is one of the world's leading independent renewable energy project developers with operations across Europe, the Americas and Asia-Pacific. At the forefront of renewable energy development for over 30 years, RES has developed and/or built almost 12,000 MW of renewable energy capacity worldwide. In the UK alone, RES currently has more than 1,000 MW of projects either constructed, under construction or consented. RES is active in a range of renewable energy technologies including onshore and offshore wind, solar, as well as enabling technologies such as energy storage.

5. RES has developed 16 onshore wind farms in Northern Ireland totalling 229 MW, which equates to 36% of Northern Ireland's onshore wind capacity. RES currently operates over 83 MW of wind capacity across Northern Ireland, has secured planning permission for a further 112 MW awaiting construction and has 92 MW in the planning system.

The Requirement for a Design & Access Statement

6. This statement is provided in accordance with Section 40 (3a&b) of the Planning Act (Northern Ireland) 2011 and Article 6b of the Planning

(General Development Procedure) Order (Northern Ireland) 2015, which require applications for Major Developments, or applications within a designated area and comprising a building or buildings where the floor space created exceeds 100 m^2, to be accompanied by a Design and Access Statement. The Development is a Major Development application. In addition, the application site falls within the Sperrins Area of Outstanding Natural Beauty (AONB) and compromises a wind farm substation compound containing two control buildings which result in the creation of circa 425 m^2 of floor space.

7. The requirement for Design and Access Statements is in response to the recognised need to secure positive place making, incorporating good design and access and contributing towards the government objective of promoting sustainable development. A Design and Access Statement should:

- Explain the design principles and concepts that have been applied to the development;
- Demonstrate the steps taken to appraise the context of the development and how the design of the development takes that context into account;
- Explain the policy or approach adopted to access and in particular, how the policies relating to access to, from and within the development have been taken into account;
- Demonstrate how policies relating to access in the local development plan have been taken into account and any specific issues which might affect access to the development for disabled people have been addressed;
- Describe how features which ensure access to the development for disabled people will be maintained;
- State what if any consultation has been undertaken on issues relating to access to the development and what account has been taken of the outcome of any such consultation;
- Explain how any specific issues which might affect access to the development have been addressed; and
- Explain the design principles and concepts that have been applied to take into account environmental responsibility.

8. This Design and Access Statement will therefore demonstrate that the Development is responsive to both its surrounding context and local development plan policies incorporating the requirements as laid out in Article 6 of the Planning (General Development Procedure) Order

(Northern Ireland) 2015 and Development Management Practice Note 12 – Design and Access Statement (April 2015).

Development Context

Physical Context

9. The Site is located approximately 4 km to the south of Dungiven in County Derry/Londonderry. The Site is positioned on an upland plateau in the north eastern part of the Sperrins Area of Outstanding Natural Beauty (AONB). The Site is accessed via the Magheramore Road and is linked to the tertiary road network to Dungiven. The location of the Development is shown in **Figure 1.1: Site Location**.

10. The Site is currently used for sheep and cattle grazing and predominantly comprises improved agricultural land, with small distinct areas of wet marshy grassland and wet heath. The lands are well managed with extensive stoned farm tracks providing access to agricultural fields bounded by mature double row hedgerows and strategically placed coniferous shelter belts. The Site is open and exposed to the north but is bounded to the south by the Altnaheglish River and associated broadleaf woodland within Banagher Glen. Further south there are extensive areas of commercial forestry that form Banagher Forest.

Planning Policy Context

PPS 1 – General Principles (March 1998)

11. PPS 1 sets out the general principles that the Department observes in making development management decisions and also establishes the requirement to secure high quality design in new developments with a desire to ensure that the relationship with surrounding spaces is considered.

PPS 3 – Access, Movement and Parking (February 2003)

12. Policy AMP 2 states that "Planning permission will only be granted for a development proposal involving direct access, or the intensification of the use of an existing access, onto a public road where such access will not prejudice road safety or significantly inconvenience the flow of traffic".

PPS 13: Transportation and Land use

13. Planning Policy Statement, PPS 13 "Transportation and Land Use" has been prepared to assist in the implementation of the RDS. It will guide the integration of transportation and land use, particularly through the

preparation of development plans and transport plans, prepared respectively by Causeway Coast & Glens BC and DfI Roads. It will also be a material consideration in dealing with individual planning applications and appeals. The main objective of PPS13 is to integrate planning and transport at the national, regional, strategic and local level and to promote "a modern, sustainable, safe transportation system which benefits society, the economy and the environment and which actively contributes to social inclusion and everyone's quality of life."

PPS 21 – Sustainable Development in the Countryside (June 2010)

14. Policy CTY1 states that non-residential development in the country side will only be permitted if there are overriding reasons why the development is essential in that location. It goes onto to state that renewable energy projects are acceptable in the countryside with the proposed buildings in this instance required for the operation of the Development. The policy also requires that appropriate proposals for drainage and access are included.

15. Policy CTY14 states that a new building in the countryside will be unacceptable where it

- Is unduly prominent in the landscape; or
- Results in suburban style development; or
- It does not respect traditional patterns or settlement; or
- It creates or adds ribbon development; or
- The impact of ancillary works would damage the rural character.

Planning Strategy for Rural Northern Ireland

16. Policy DES 4 Areas of Outstanding Natural Beauty requires that development proposals within an AONB should be sensitive to the distinctive character of the area. In applying this, account should be given to the economic and social welling being of those living within the AONB and the needs of local communities. Respect should be given to the traditional architectural styles and settlement patterns in these areas.

Building on Tradition – A sustainable Design Guide for the Northern Ireland Countryside (May 2012)

17. This document is intended to support PPS 21 and offer guidance on its implementation. The relevant sections are 4, relating to visual integration and 6, on new buildings in the countryside.

Local Policy

18. The Site falls within the Causeway Coast & Glens Borough Council area and is located within the Sperrins AONB. The relevant local development plan is the Northern Area Plan (2016).

19. In terms of specific policies relating to access. Route Protection – Rural Schemes under policy TRA1: Rural Route Protection, one of the proposals that is relevant to the Development is the A6 Dungiven bypass, which would provide a dual carriageway bypass of the town. This strategic scheme is in line with the The Regional Strategic Transport Network Transport Plan 2015.

20. The A6 Dualling commenced in April 2018 and will see the construction of 25.5 km of new high standard dual carriageway between Dungiven and Drumahoe, including a bypass of Dungiven with the works due to be completed in Spring 2022. The amendments to the road network surrounding Dungiven will not alter the traffic management proposals set out below.

21. The plan also identifies PPS 3 (summarised earlier in this section) and DCAN 15: (2nd Edition) Vehicular Access Standards, as relevant guidance, both of which were taken into account in the design of the access to the Development.

Design Statement

Site Selection

22. RES considers a range of potential factors when selecting a wind farm site. The following are key attributes that contribute to a viable site, which the application site possesses:

- Wind Speeds/Energy Yields: Sufficiently high wind speeds to ensure energy production from the wind turbines that would yield an adequate return on investment
- Planning: A site which complies with planning policy and in particular, avoids unacceptable effects on areas designated by statutory agencies; maintains appropriate distances from dwellings to avoid unduly impacting local amenity and; avoids impeding or interfering with major electromagnetic transmission and airport communication systems

- Area of Site: A site must have sufficient area to accommodate the number of wind turbines required for economic viability
- Access: Adequate vehicular access to a site using existing roads wherever possible to minimise the amount of civil works, particularly during the construction phase
- Local Terrain and Topography: Terrain and topography affect wind flow across a site and need to be considered in relation to turbine performance, specification and life-span
- Ground Conditions: A site must have suitable ground conditions for the construction of wind turbine foundations, erection of the machines and the provision of access tracks and cables.

Design Strategy

Design Principles

23. The design of the Development was optimised in order to produce a layout that maximises the use of the land available for wind power generation balanced against the overall environmental impact of the development.

24. The following design principles were applied:

- The turbines must be separated by specific distances both perpendicular to, and in line with, the prevailing wind direction to minimise turbulent interaction between the wind turbines (i.e. wake effect). This needs to be considered to balance turbine performance with energy extraction, and to protect the life-span of the turbines. Spacing requirements vary between turbine manufacturers and are also subject to wind conditions
- The turbines must be located at a distance sufficiently far from occupied residential property to ensure adherence to relevant noise criteria and to ensure that shadow flicker impacts are minimised
- The turbines should be located in order to avoid and/or minimise potential effects on environmentally sensitive features (ecology, archaeology, hydrology etc.)
- Landscape and visual design considerations should be taken into account
- Mitigation by design should be the principle method of reducing potential environmental impacts
- All site infrastructure should be designed as efficiently as possible to reduce the overall extent of development whilst maximising the renewable energy generation potential.

25. For the Development, the upland nature of the Site created a number of sensitivities that needed to be carefully addressed through appropriate design of the wind farm. The basis of the design process is the evaluation of the various constraints that were identified through the environmental surveying that was undertaken between 2013 and 2018, and consideration of landscape and visual effects. The following sections identify potential issues and outline how these have been addressed through appropriate design.

Key Considerations

26. Following consultation and baseline characterisation of the Site, the following key environmental issues were identified:

- Landscape and visual
- Archaeology and cultural heritage
- Ecology
- Ornithology
- Fisheries
- Geology and the water environment
- Noise and shadow flicker
- Traffic and transport.

27. The issues listed above were considered through the design with the aim of designing out significant effects. Where it was not possible to mitigate by design, the issues were considered further as part of the Environmental Impact Assessment (EIA), as detailed in the Environmental Statement (ES).

28. A key tool in this process was the combined constraints drawing **(Figure 3.3)** which was iteratively updated as new information from surveys, site visits and consultation was received. The following surveys informed the combined constraints drawing:

- Breeding and wintering bird survey
- Ornithological vantage point survey
- National Vegetation Classification (NVC) Phase 2 survey
- Terrestrial fauna surveys
- Fisheries survey
- Peat probing
- Hydrology assessment
- Archaeology and cultural heritage surveys
- Landscape field survey
- Transport and traffic reconnaissance trip
- Technical and engineering site walkovers.

29. In addition, a site walk over to review the turbine and infrastructure layout was held by RES, which was attended by the team of environmental, technical and engineering specialists to collaboratively review and develop the layout in response to the combined constraints, discuss interrelationships and mitigation, resolve potential conflicts and agree actions for further assessment. This ensured that interrelationships were thoroughly considered in the design of the layout.

Turbine Layout Evolution

30. There were two principle iterations of the turbine layout, the latter two are shown in **Figure 3.1: Turbine Layout Evolution**, which were developed at the following two key stages in the project process:

- Initial Turbine Layout (Layout 1), when turbines were located based on preliminary constraints only and prior to baseline environmental surveys being completed;
- Primary Turbine Layout / EIA baseline data stage (Layout 2) when baseline surveys were complete and constraint information gathered and final refinements were made to the layout.

Initial Turbine Layout (Feasibility Stage)

31. At the beginning of the development process an initial layout was produced to show the maximum potential extent of the development within the space available at the time and in accordance with the design principles, prior to baseline surveys having been commenced. The layout was informed by the following constraints:

- Preliminary watercourse buffers
- Slope
- Known private water supply locations
- Separation from housing (1000m) / Double the minimum separation distance of 500 m.
- 164.9 m buffer (tip height + 10%) to public roads, in accordance with the Best Practice Guidance to PPS 181.

32. This identified that the Site could potentially accommodate 7 turbines with a 112m rotor diameter.

33. This initial feasibility layout was reviewed by the Landscape Consultant. A Zone of Theoretical Visibility diagram (ZTV) and wirelines were produced for a provisional 7-turbine layout and the potential landscape and visual issues that would need to be considered if a wind farm were to be

[1] Best Practice Guidance to Planning Policy Statement 18: Renewable Energy, DOE Planning & Environmental Policy Group, August 2009.

proposed on this site were considered in broad terms based on previous experience of assessing wind farms in other this part of the Study Area. This included a preliminary analysis of the site in its wider landscape context, including its location within the Sperrin AONB and its potential relationship with other wind farms.

34. The feasibility appraisal concluded that the site was likely to meet the criteria for acceptable development as set out in planning policy and supplementary guidance. The 7-turbine layout presented a small ZTV in terms of its geographical coverage, but the wirelines illustrated some clustering of turbines in the centre of the layout, which may need to be reviewed to create a more balanced layout.

Primary Turbine Layout (EIA Baseline Stage)

35. Prior to detailed site assessments being undertaken by external consultants, RES technical analysts undertook site visits to check that there were no physical characteristics on site that may impact upon the turbine performance such as topography and the proximity and height of forestry in relation to the turbines.

36. RES engineering and construction undertook site visits with ecological and geology/hydrology consultants to review the turbine locations and to agree principles for the design of the onsite infrastructure based on the constraints determined to date.

37. Following further consultation with landowner(s), Turbine 7 was omitted, and this necessitated other changes to maximise the efficiency of the turbines and to create a balanced layout.

38. The revised layout was informed by the original constraints with the following amendments:

- 165 m buffer to power lines;
- Hydrological buffer 50 m;
- Hydrological buffer 10 m;
- Archaeological features;

39. The removal of Turbine 7 from the western-most side of the wind farm enabled some refinements to the layout.

- T4 moved south west (turbine separation);
- T1-T3 moved closer together (to avoid boundary overfly).

40. The resulting 6 turbine layout with 112.0 m rotor diameter produced a more compact layout as detailed below in 43.

Combined Constraints

41. To ensure that all requirements were captured a combination of desktop and site-based surveys were undertaken to refine constraints. Detailed environmental and technical surveys were carried out to characterise the baseline environmental conditions on the Site and associated study areas, as described in more detail in chapters 4 to 13 of this ES. Any constraints to development resulting from the baseline surveys were used to build up the combined constraints drawing.

Landscape & Visual

42. As mentioned above a Landscape Consultant was involved throughout the design process to provide advice regarding the scale of the Development and turbine heights and geometry.

43. The 6-turbine option that is that is presented in the EIA is the result of this iterative design process. The ZTV for the 6-turbine layout is not significantly altered from the 7-turbine layout but the reduction in the number of turbines has resulted in several benefits, namely:

- The turbines can be more evenly spaced in relation to each other and to the site topography which has resulted in a simpler layout with fewer variations in tip heights in relation to contour AOD levels;
- There are fewer instances where 'stacking' of turbines occurs. Stacking is where two or more turbines will appear directly in front of each other in a view and will therefore result in a 'heavier' or more solid, and hence more prominent appearance;
- The reduction in the number of turbines has allowed the turbines to be located at elevations away from the summit of Teeavan Hill and this has slightly reduced the level of visibility from the following parts of the Sperrin AONB: around the summit of Slieve Gallion to the south; Banagher Road to the west; B40 North Sperrins Scenic Drive to the south west.
- Ensuring that the turbines remain clear of the summit of Teeavan Hill also means that the Development is viewed as a small feature that is subordinate to the wider sequence of summits which stretch in a crescent-shaped arc from Binevenagh in the far north of the Study Area into the main Sperrin Mountain range across the western part of

the Study Area. Visual effects on the AONB and this sequence of views along the Binevenagh and Sperrin ranges of uplands are minimised in all instances.

44. Provisional Viewpoints were analysed as part of the LVIA and the cultural heritage assessment (Chapter 5) to identify potentially significant effects that might result from the turbine layout, as well as from the effects of the wind farm as a whole. The Provisional Viewpoint were discussed with the Planning Department of Causeway Coast & Glens BC and the Department of Communities: Historic Environment Division, (DfC:HED) and their suggestions fed into the selection of a final list of Viewpoints that are presented and analysed in detail in **Chapters 4: Landscape & Visual** and **Chapter 5: Archaeology & Cultural Heritage**.

Archaeology

45. There are two scheduled monuments within the site boundary / land under applicant control. These sites were mapped and avoided accordingly. No construction works would occur within the fenced area of moorland where they are situated.

Vegetation

46. Much of the site, particularly around its margins, consists of agricultural fields that support species-poor improved and semi-improved grassland, with variable cover of rushes in the wetter fields. Some fields are separated by mature coniferous shelter belts, and a more extensive area of coniferous plantation is present along one field boundary. Fields on lower ground are often separated by hedgerows or discontinuous shrubs, and occasionally mature trees. Hedgerows are invariably species-poor and support species-poor basal vegetation communities.

47. The higher ground formerly supported extensive blanket bog and heath communities, as is evidenced by the presence of the degraded and heath habitats that are present in some of the more extensive field units. The peat substrate has been almost universally cut over and has since become fully vegetated. Many fields retain thin peat that now supports marshy grassland and which may be dominated by rush *Juncus* species or purple moor-grass *Molinia caerulea*, or may support patchy acid grassland.

48. Grassland habitats have low species diversity and are generally of low botanical interest. Minor streams or active drains are present in parts of the site; their banks generally support vegetation that is similar to that of the adjacent fields, or may be marked by increased rush growth

49. Given the nature of the site peat probing was limited to within close proximity of the existing access tracks that are to be upgraded, where new access tracks are proposed and at main infrastructure elements e.g. turbines, crane hardstanding's and substation.

50. A Phase 1 Geotechnical Study including Peat Slide Risk Assessment was undertaken and concluded that the majority of the site exhibits a peat depth of under 0.5m, which is generally considered to have a negligible peat slide potential. Peat depth in areas where development is proposed has been determined by the assessment to vary to a maximum depth of 1.3m. Peat in many of these areas is noted to have appeared to have been historically treated resulting in an increased shear strength further reducing the risk.

Terrestrial Fauna

51. No badger setts have been identified within the survey area (although badgers are known to be present within the wider environs of the site).

52. All turbines have been positioned to maintain a minimum 57.57m buffer (50m stand-off distance from the tip of the turbine blade to the top of the adjacent habitat feature). This is based on a (blade length of 56m, hub height of 94m and a feature height of 25m).

53. The results of bat activity surveys confirmed that most of commuting and foraging was along linear features such as watercourses and edges of adjacent industrial tree monoculture plantations. The infrastructure layout has taken account of bat activity along these features and turbines have been sited to avoid these areas. In addition, it is proposed to clear-fell the existing coniferous shelterbelts for a distance of 100m surrounding all turbines (as shown on Figure 6.2).

Water Environment and Fisheries

54. The hydrology consultant recommended watercourse buffers of 50 m and 10 m depending on the catchment size of the watercourse, which were agreed as appropriate by the fisheries consultant.

Public Roads

55. 165 m buffers were applied to nearby public roads in line with the Best Practice Guidance to PPS18 which recommends a setback distance of at least tip height plus 10% between turbines and roads.

Powerlines

56. There is an existing 11kV line that runs through the site and NIE Networks safety policy for clearance distances to 11kV is tip height plus 6 metres. A 165 m buffer has been applied to provide a setback distance of at least tip height plus 10% between turbines and overhead line.

Finalising Turbine Layout – EIA Baseline Stage – Final Layout

57. Using design principles agreed with environmental, engineering and technical disciplines, the infrastructure layout was developed and used to undertake baseline assessments.

58. During the course of the baseline surveys one minor change was made to the turbine layout as Turbine 4 was moved southeast by 7 metres to take into account latest mapping of site / landowner boundary. The revised turbine layout is illustrated in Layout 2 – **Figure 3.1: Turbine Layout Evolution**.

59. A 50 m micro siting radius was applied to each of the turbines. The extent of this was then reduced such that the micro siting avoids any of the combined constraints. The final micro siting areas are included in **Figure 2.1: Infrastructure Layout**.

Infrastructure Design Evolution

60. The infrastructure design has evolved through the EIA process as illustrated in **Figure 3.2: Infrastructure Design Evolution**, Designs 1 to 2.

Engineering considerations

61. The following general principles were taken into consideration when designing the supporting infrastructure:

- Avoidance of environmental and technical constraints (as shown in Figure 3.3)
- Design of the track layout to follow natural contours as far as possible, to avoid unnecessary amounts of excavation and reduce adverse hydrological impacts using the following methods:
- Maximise the use of existing track locations via upgrades;
- Minimisation of the overall length of access track;
- Minimisation of the number of watercourse crossings, as far as possible

- Avoidance of steep slope areas to minimise earthworks (except where existing farm access tracks where in situ);
- Incorporation of measures to improve the visual appearance of the scheme, including reinstatement of temporary infrastructure following the construction period;
- Sympathetically locating control room building / substation / energy storage facility within the site surroundings.

62. A number of amendments were made to the design of the infrastructure between Design 1 and Design 2 on (as shown on Figure 3.2) for engineering reasons and these are summarised below:

- Addition of temporary enabling compound near site entrance for safety and security purposes;
- Realignment of the track to T3 including using bell mouth at junction to accommodate temporary crane hard standings;
- Realignment of access track on approach to T6, realignment of T6 crane pad and access track between T6 & T5 so that track follows contours thereby reducing extent of earthworks;
- The configuration of substation, associated car parking and temporary construction compound / energy storage facility was refined;
- Access track to T2 and T1 was simplified and no longer includes a dedicated spur to T2 thereby reducing length of access track;
- Minimization of land take by combining bell mouths at junctions / turning heads with areas of temporary crane hard standing to reduce the extent of infrastructure.

63. Key adjustments in response to constraints made through the design evolution are summarised in the following sections.

Vegetation

64. The engineering considerations minimised impact on sensitive habitats by utilising the existing track locations via upgrades where possible. This minimised the length of new track and where new access track is proposed, it is predominantly located in agricultural fields and coniferous shelterbelts of low ecological value.

Water Environment

65. The number of watercourse and drainage crossings has been minimised through the principle of avoidance at the layout design stage, and a number of culverts have been sited to coincide with existing culverts which will be upgraded. Proposals submitted in conjunction with this assessment indicate:

- Two crossings of a significant watercourse (Stream C and tributary), both at locations where an existing culverted track exists.
- Five crossings of minor watercourses, the majority of which comprise existing track-side drains.

66. Minor watercourses, characteristic of cut peat drainage and existing track drainage, are proposed to be diverted to permit siting of turbine bases and infrastructure at Wind Turbine Generator (WTG) 5 and 6. The drains shall be diverted as enabling works prior to undertaking main civil earthworks

67. The location and nature of watercourse crossings were reviewed with the hydrology and fisheries consultants as detailed in Chapter 8: Fisheries and Chapter 9: Geology & Water Environment.

Site Entrance Location

68. The site entrance is located at an existing access to farm lands on the south side of the Magheramore Road where two stone pillars and walls mark a well-defined farm entrance. The existing access will be upgraded to provide suitable access. As specified in DCAN 15, visibility splays measuring 120m x 4.5m are provided in both directions.

69. Following construction, the site entrance will be reinstated to reduce the extent of hardstanding back to its original pre-construction state. Stone pillars and walls removed to allow access will be reinstated as will stock proof fencing.

Control Building and Substation

70. The buildings will be centrally located within the turbine array and set back from the northern edge of the plateau and immediately bounded to the west by coniferous shelterbelt and a further shelter belt to the south, which will further screen views. Visibility will be limited from out with the site. The building will be orientated to be accessed from the south.

71. The buildings will be traditional in nature with rendered walls and tiled roofs, common characteristics of many rural buildings. The appearance of the buildings has been selected to reflect the rural character of the area to maximise the integration of the buildings within the wider landscape.

Temporary Construction Compound / Energy Storage

72. The temporary construction compound is required to be located close to the main bulk of the construction works and the energy storage facility is co-located adjacent to the Control Building and Substation.

73. Energy storage containers will utilise the southern portion of the temporary construction compound on a permanent basis with the remainder of the temporary construction compound being removed and returned to farmland.

Temporary Enabling Works Compound

74. A temporary enabling works compound will be located on the site to provide facilities until the Temporary Construction Compound is in situ.

75. The location of the temporary enabling works compound has been selected for reasons of safety and security. Once the Temporary Construction Compound is completed, the enabling works compound will be used primarily as a gatehouse for the monitoring of incoming vehicles. On completion of the construction work these facilities will be removed and will be reinstated.

Final Infrastructure Layout

76. The final infrastructure layout is shown in Design 2 of **Figure 3.2: Infrastructure Design** Evolution. Once finalised, the Planning Application Boundary was redrawn, ensuring sufficient space within the boundary for all features including SUDS.

77. The final infrastructure layout and combined constraints is shown in **Figure 3.3: Combined Constraints & Infrastructure**.

Access Statement

78. A full assessment of the potential impact of the Development on traffic and transport is provided in ES Volume 2, Chapter 11: Traffic and Transport.

79. The following key considerations were taken into account during the design and assessment of access arrangements for the Development, including relevant policy and guidance:

- Access routes for abnormal indivisible loads (AIL), normal construction traffic and associated road improvements
- The type and volume of traffic generated by the Development
- Identification of sensitive/critical locations along the delivery route
- Assessment of construction, operation and decommissioning traffic impacts
- Outline of suitable mitigation measures and the evaluation of residual impacts
- Cumulative impact of surrounding consented and proposed developments
- DOE – Planning Policy Statement 3 - Access, Movement and Parking (2005)
- DOE - Planning Policy Statement 18: Renewable Energy (2009)
- DOE - Best Practice Guidance to Planning Policy Statement 18 'Renewable Energy' (2009)
- IEMA - Guidelines for the Environmental Assessment of Road Traffic (1993)

80. A summary of consultation responses and proposed mitigation measures are included in ES Volume 2, Chapter 11: Traffic & Transport.

Site Entrance

81. The site entrance is located at an existing access to farm lands on the south side of the Magheramore Road where two stone pillars and walls mark a well-defined farm entrance. The existing access will be upgraded to provide suitable access. As specified in DCAN 15, visibility splays measuring 120m x 4.5m are provided in both directions.

82. Following construction, the site entrance will be reinstated to reduce the extent of hardstanding back to its original pre-construction state. Stone

pillars and walls removed to allow access will be reinstated as will stock proof fencing.

Site tracks

83. Within the site, access to the wind turbines and other infrastructure from the site entrance will be provided by approximately 4.3 km of site tracks. To minimise the impact of the proposed site infrastructure, existing site tracks have been utilised where practical for access to the turbine locations. 2.1 km of existing site tracks will be upgraded in combination with 2.2 km of new access tracks.

Delivery Routes

84. The proposed access route for AILs from Lisahally Port has been used previously for the construction of various wind farms that have subsequently utilised the A6. From Lisahally, the route will travel onto Maydown Road and turn west onto the Clooney Road and travel west for approximately 2.5km to Cresent Link and continuing west to the Altnagelvin Roundabout before heading east along Glenshane Road (A6) for approximately 26km and turning south on to the Feeney Road for 2.5km before heading east on the Bangaher Road, turning left onto the Carnanbane Road and continuing south until the junction with the Magheramore Road. AIL vehicles would turn right and travel southwest until the delivery vehicle had cleared the junction before reversing northeast along the Magheramore Road for approximately 320 metres before turning left into an existing farm entrance on the Magheramore Road that will be modified to create a suitable Site Entrance. See **Figure 11.1: Turbine Delivery Route**.

85. The proposed return route for the delivery vehicles is similar to the proposed delivery route noted above. Once the turbine components have been delivered, the vehicles will be shortened so they are no longer than a typical articulated HGV. See **Figure 11.2: HGV Delivery Route**.

86. Reinstatement will be undertaken to any street furniture which may be removed on a temporary basis. In the unlikely event that a replacement blade is required during the operational phase of the wind farm, the widenings at the site entrance will need to be reopened temporarily, after which they will be reinstated. Any works will be undertaken following consultation with DfI Roads.

87. It is proposed that Normal HGV load delivery routes (including stone and concrete) will utilise the Banagher and Carnanbane Roads from the Feeny

Road and / or the Magheramore Road, with sources of material to be confirmed prior to construction. No passing bays will be required as the roads are largely two-way with adequate passing bays located where the road is narrower to accommodate traffic to and from the existing quarry on the Magheramore Road.

88. Consideration has been given to the effect of increased HGV traffic flow on Severance, Driver Delay, Pedestrian Delay, Pedestrian Amenity, Fear and Intimidation, Accidents and Safety and Cumulative Impacts. Furthermore, consideration has been given to the environmental effects of any road improvement/widening works.

89. The abnormal load route and the HGV routes have been assessed as acceptable in the ES. Taking into account the existing vehicle movements on the affected roads, and the proposed type and frequency of vehicle numbers, it is considered that with the appropriate mitigation measures as set out above, there will be no significant impacts.

Disability access

90. Disabled access to the buildings within the Development will be provided via ramps and suitable parking will be provided.

Sustainability

91. Sustainable design refers to the selection of an appropriate site for a particular development whilst ensuring that the architectural style is suitable for the site, so that the development will not detract from the sense of place. It incorporates the use of environmentally friendly materials and construction techniques as well as resource efficiency, all of which will help to minimise environmental impact whilst conserving local character and enhancing the viability of local communities.

92. The Design Statement section of this report details how the site was selected as appropriate, and describes how the layout of the Development has been carefully designed in order to minimise environmental effects.

93. In addition, the Development incorporates a host of mitigation measures as recommended in the technical chapters of the Environmental Statement Volume 2 (Main Report), further reducing environmental effects and incorporating best practice. Key measures include the following:

- An Outline Habitat Management Plan has been prepared to restore and enhance blanket bog and wet heath habitats on site (ES Volume 4 Technical Appendix 6.4)

- A Geotechnical Assessment that assess peat management has been prepared in accordance with guidance issued by the Scottish Environmental Protection Agency (SEPA) and Scottish Renewables (ES Volume 4 Technical Appendix 9.3)
- The Site will adopt a surface water management plan/site drainage design using the principles of Sustainable Drainage, promoting the principles of on-site retention of flows and use of buffers and other silt removal techniques. All drainage-related mitigation measures proposed will be encompassed by a robust and proven Sustainable Drainage System (SuDS) design which will be used to control drainage and silt management on the Site. An outline SUDS Plan has been prepared (Contained within ES Volume 4 Technical Appendix 9.1).
- An Outline Construction Environmental Management Plan (oCEMP) (Contained within ES Volume 4 Technical Appendix 6.5) is included within the Environmental Statement and a Construction and Decommissioning Method Statement (CDMS) will be prepared if planning consent is granted. The CEMP and CDMS would be agreed with the Causeway Coast & Glens BC and would describe the detailed methods of construction and working practices, work to reinstate the site following completion of construction activities and methods to reinstate the site post operation.

94. The Development is a 21.6 MW wind farm consisting of six x 3.6 MW turbines. The amount of electricity that could be produced by the Development is estimated at 87 gWh per year which is enough electricity to meet the needs of 22,700 homes each year.[2] This is equivalent to 40.6 percent of the housing stock in Causeway Coast and Glens Borough Council area.[3] In addition, the Development is also estimated to reduce CO_2 emissions by 40,000 tonnes each year. This equivalent to 25,200 newly registered cars.[4]

95. A socioeconomic assessment of the Development was prepared by Oxford Economics. The Development is estimated to involve a capital spend of £18.46 million. Of this total, £6.08 million (nominal prices) will be realised within the Northern Ireland economy. The projected 12-month construction phase is estimated to create or sustain 56-73 total (direct, indirect and induced) job years of employment, £1.53-£2.02 million (2016

[2] For Magheramore, a load fact of 0.46 was provided by RES and applied to Oxford Economics' calculations. This load factor allows us to account for wake and electrical losses using typical wind speeds/directions etc. to give a realistic prediction of electricity output (rather than using a theoretical maximum level whereby it is assumed that wind blows for 24 hours a day 365 days a year on every wind farm site.)

[3] Oxford Economics Internal Model Suite.

[4] https://www.gov.uk/government/publications/new-car-carbon-dioxide-emissions

prices) of wages and £2.64-£3.41 million (2016 prices) of GVA to the Northern Ireland economy. For further details see ES Volume 2 (Main Report) Chapter 13: Socioeconomics.

96. Potential effects on local residents in terms of noise, shadow flicker, traffic and transport, have been considered in the design of the Development and assessed in the ES. Predicted effects were found to be acceptable with incorporation of the proposed mitigation.

97. RES is committed to finding effective and appropriate ways of consulting with all its stakeholders, including local residents and community organisations, and believes that the views of local people are an integral part of the development process. RES engaged early with the local community (over six months prior to the submission of the planning application) to facilitate a constructive consultation process. No feedback was received from the community consultation in relation to the specific design/layout of the wind farm, and as such no modifications have been made in this regard. However, the consultation process, assisted RES in gaining a greater understanding of any concerns the community may have and allowed us to consider these aspects as part of the environmental assessment process.

98. Through the consultation process, we have taken the opportunity to engage with interested parties to facilitate public understanding of the potential impacts and benefits of the Development. A Pre-Application Community Consultation (PACC) Report has been submitted with the planning application.

Conclusion

99. This Design and Access Statement has presented the final design of the Development. It explains the design principles and concepts that have been applied to the development, demonstrating the steps taken to appraise the context of the development and how the design of the development takes that context into account whilst ensuring adherence with all relevant policies.

100. It has explained the approach adopted for access and in particular, how the policies relating to access to, from and within the Development have been taken into account. Arrangements relating to access to the development for disabled people have been addressed. It has also outlined the consultation process and its effects on the design.

101. It has explained the design principles and concepts that have been applied to take into account environmental responsibility. In all instances sustainability has been considered to ensure the selection of an appropriate site for the development whilst ensuring the wind farm layout and architectural style of the buildings are suitable for the site, so that the development will not detract from the sense of place. The design has also considered the use of environmentally friendly materials and construction techniques, as well as resource efficiency, all of which will help to minimise environmental impact whilst conserving local character and enhancing the viability of local communities.

102. The resulting Development layout includes the following features:

- A simple layout with few variations in tip heights in relation to contour AOD levels;
- Reduction of impacts on environmental, technical and engineering constraints and sensitivities identified through site survey and consultation;
- Reduction in overall land take and ground disturbance through careful design of site infrastructure including tracks and crane hardstandings;
- A building that is integrated and sympathetic to its setting in the surrounding landscape;
- An access that is well placed to reduce both visual impact and impact on road users;
- A development which is sustainable and environmentally responsible.

Figures

MAGHERAMORE WIND FARM

FIGURE 1.1

SITE LOCATION MAP

KEY:

SITE LOCATION

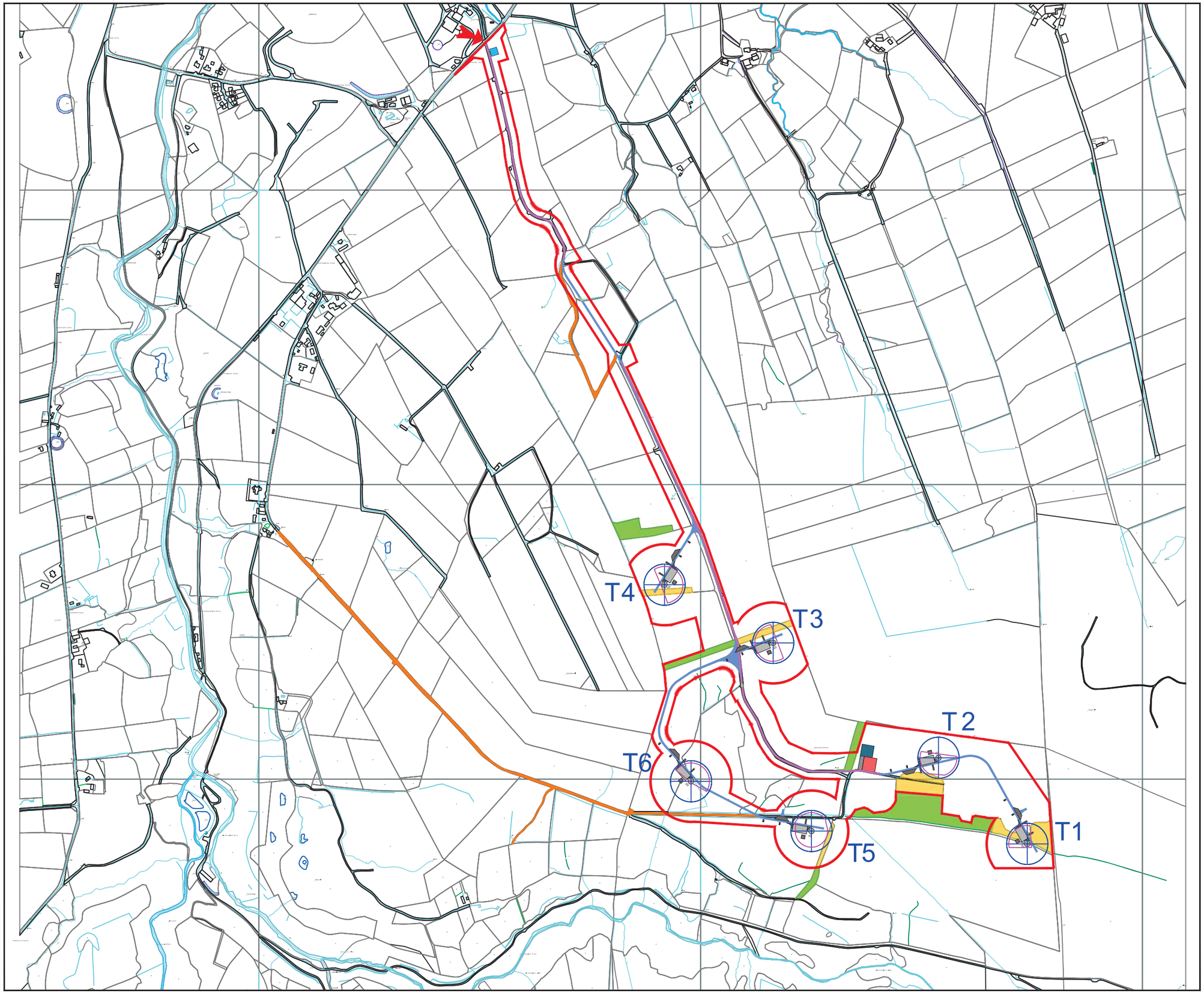
LAYOUT DWG N/A	T-LAYOUT NO. N/A

DRAWING NUMBER

03426D2202-01

SCALE - 1:50,000 @ A3

ENVIRONMENTAL STATEMENT



MAGHERAMORE WIND FARM

FIGURE 2.1

INFRASTRUCTURE LAYOUT

KEY

- PLANNING APPLICATION BOUNDARY
- WIND TURBINE LOCATION
- TURBINE MICROSITING
- NEW SITE TRACKS
- UPGRADED SITE TRACKS
- EXISTING TRACKS
- WATERCOURSE CROSSING
- CRANE HARDSTANDING AREA
  - PERMANENT
  - TEMPORARY
- TEMPORARY ENABLING CONSTRUCTION COMPOUND
- TEMPORARY CONSTRUCTION COMPOUND/ ENERGY STORAGE AREA.
- CONTROL BUILDING & SUBSTATION COMPOUND WITH PERMANENT HARDSTANDING AREA
- FORESTRY TO BE RETAINED
- FORESTRY TO BE REMOVED
- SITE ENTRANCE LOCATION

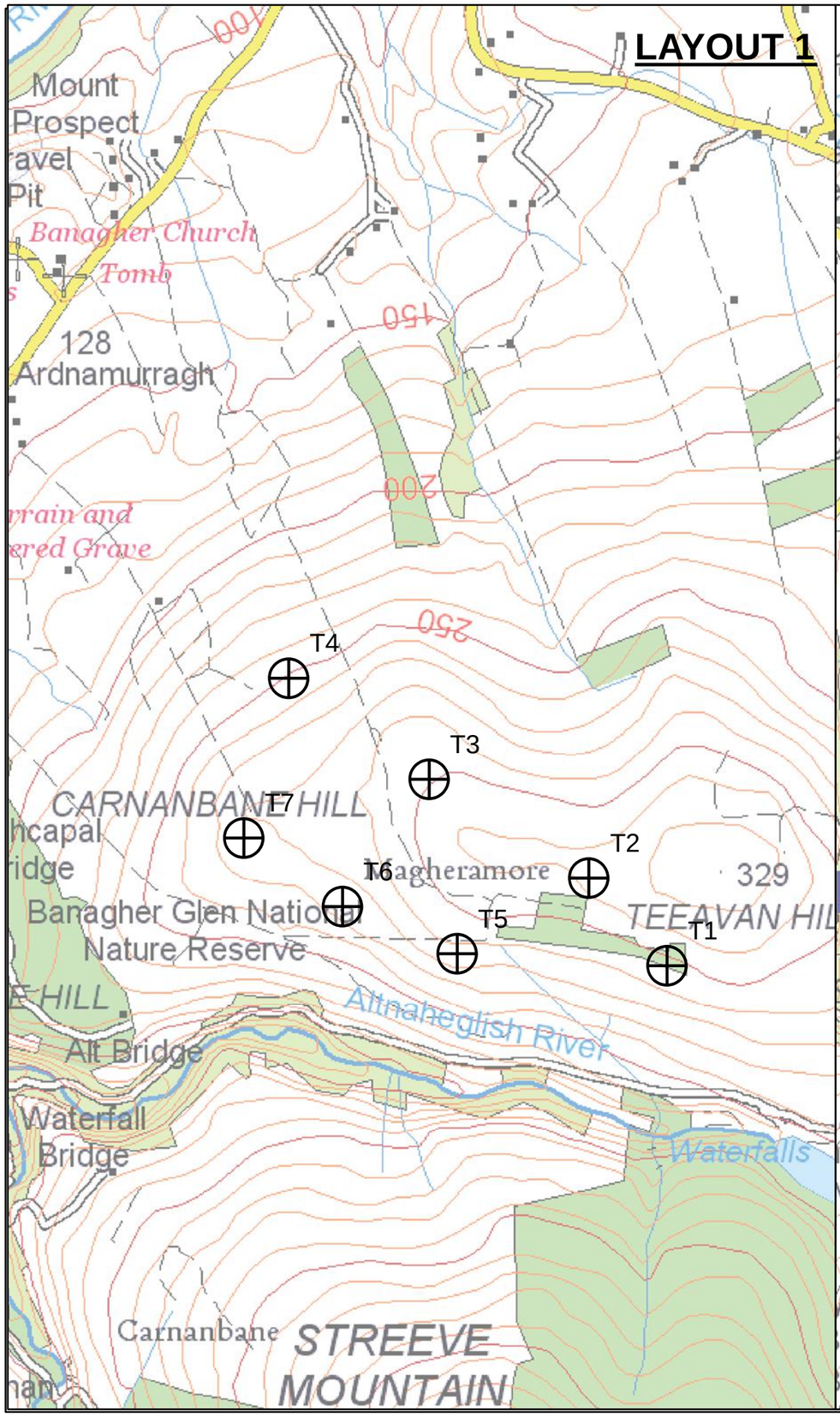
LAYOUT DWG	03426D0001-06	T-LAYOUT NO.	PNIRmgh020

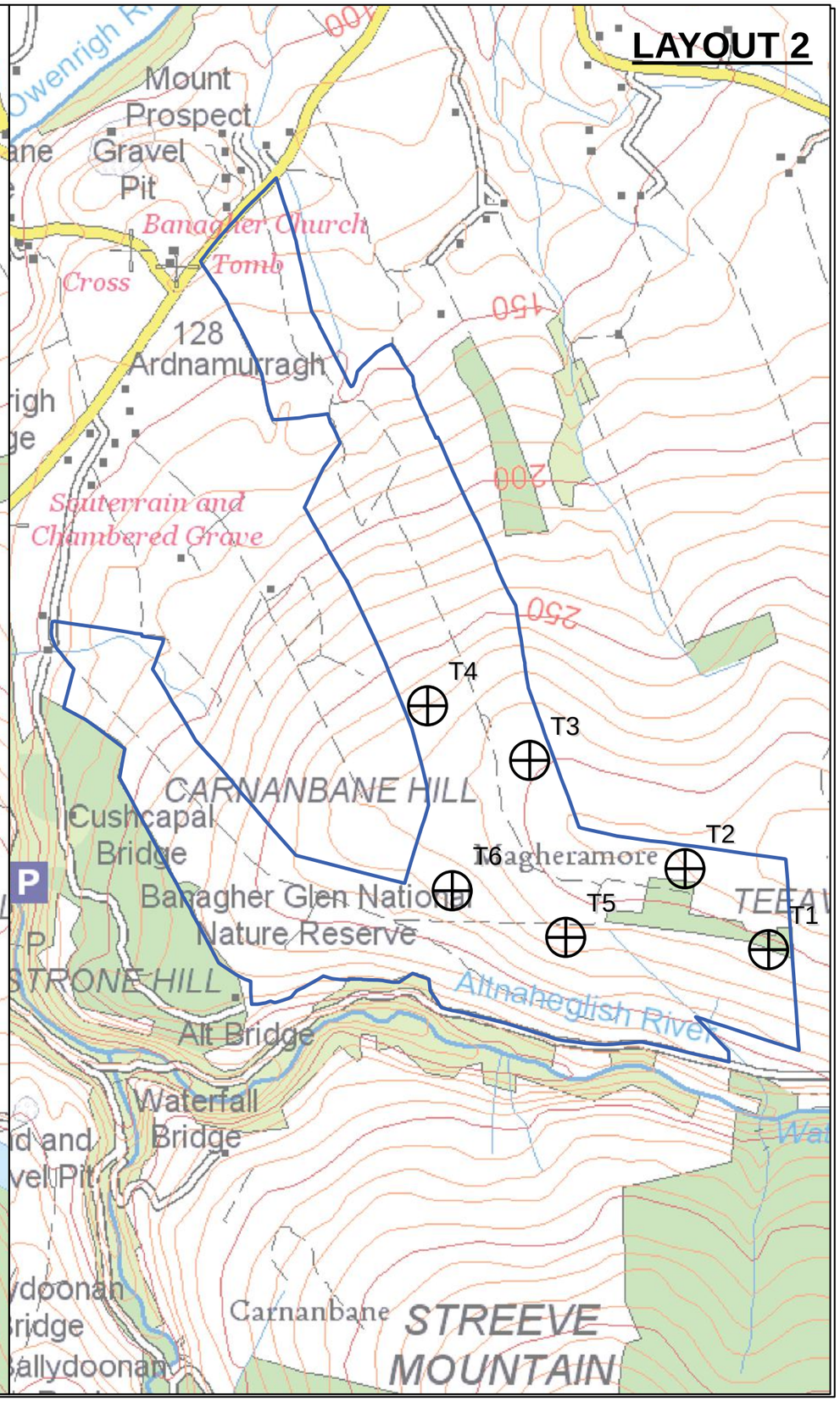
DRAWING NUMBER

03426D1001-01

SCALE - 1:10,000 @ A3

ENVIRONMENTAL STATEMENT





MAGHERAMORE WIND FARM

FIGURE 3.1

TURBINE LAYOUT EVOLUTION

Turbine Location

Site Boundary

Layout 1 - PNIRmgh007
7 turbines x 112 m rotor diameter

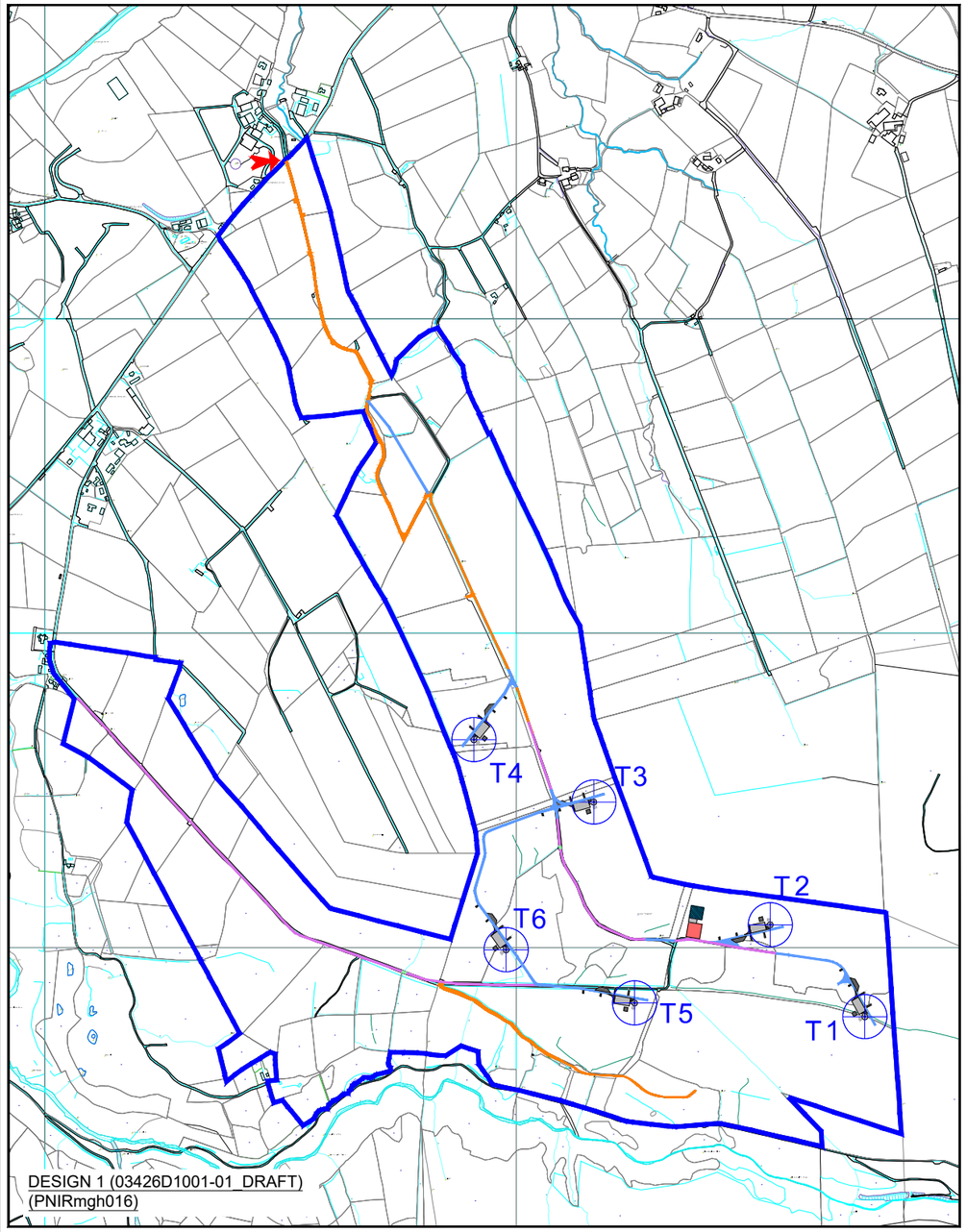
Layout 2 - PNIRmgh020
6 turbines x 112 m rotor diameter

LAYOUT DWG	T-LAYOUT NO.
N/A	AS SHOWN

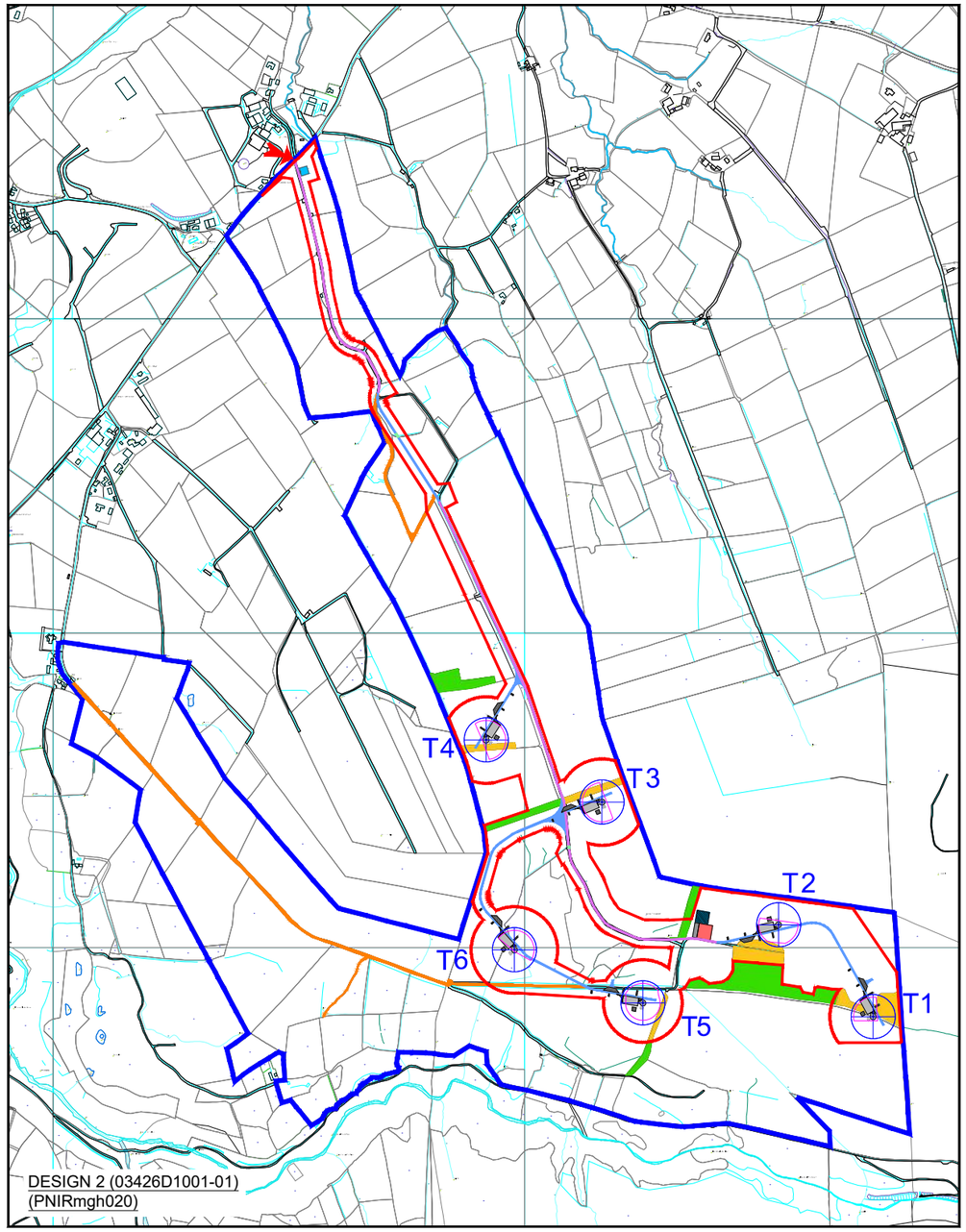
DRAWING NUMBER
03426D0002-02

SCALE - 1:15,000 @ A3

ENVIRONMENTAL STATEMENT



DESIGN 1 (03426D1001-01_DRAFT)
(PNIRmgh016)



DESIGN 2 (03426D1001-01)
(PNIRmgh020)

MAGHERAMORE WIND FARM

FIGURE 3.2

INFRASTRUCTURE DESIGN EVOLUTION

KEY

- PLANNING APPLICATION BOUNDARY
- LAND UNDER APPLICANT CONTROL
- WIND TURBINE LOCATION
- TURBINE MICROSITING
- NEW SITE TRACKS
- UPGRADED SITE TRACKS
- EXISTING TRACKS
- WATERCOURSE CROSSING
- CRANE HARDSTANDING AREA
  - PERMANENT
  - TEMPORARY
- TEMPORARY ENABLING CONSTRUCTION COMPOUND
- TEMPORARY CONSTRUCTION COMPOUND/ ENERGY STORAGE AREA.
- CONTROL BUILDING & SUBSTATION COMPOUND WITH PERMANENT HARDSTANDING AREA
- FORESTRY TO BE RETAINED
- FORESTRY TO BE REMOVED
- SITE ENTRANCE LOCATION

N

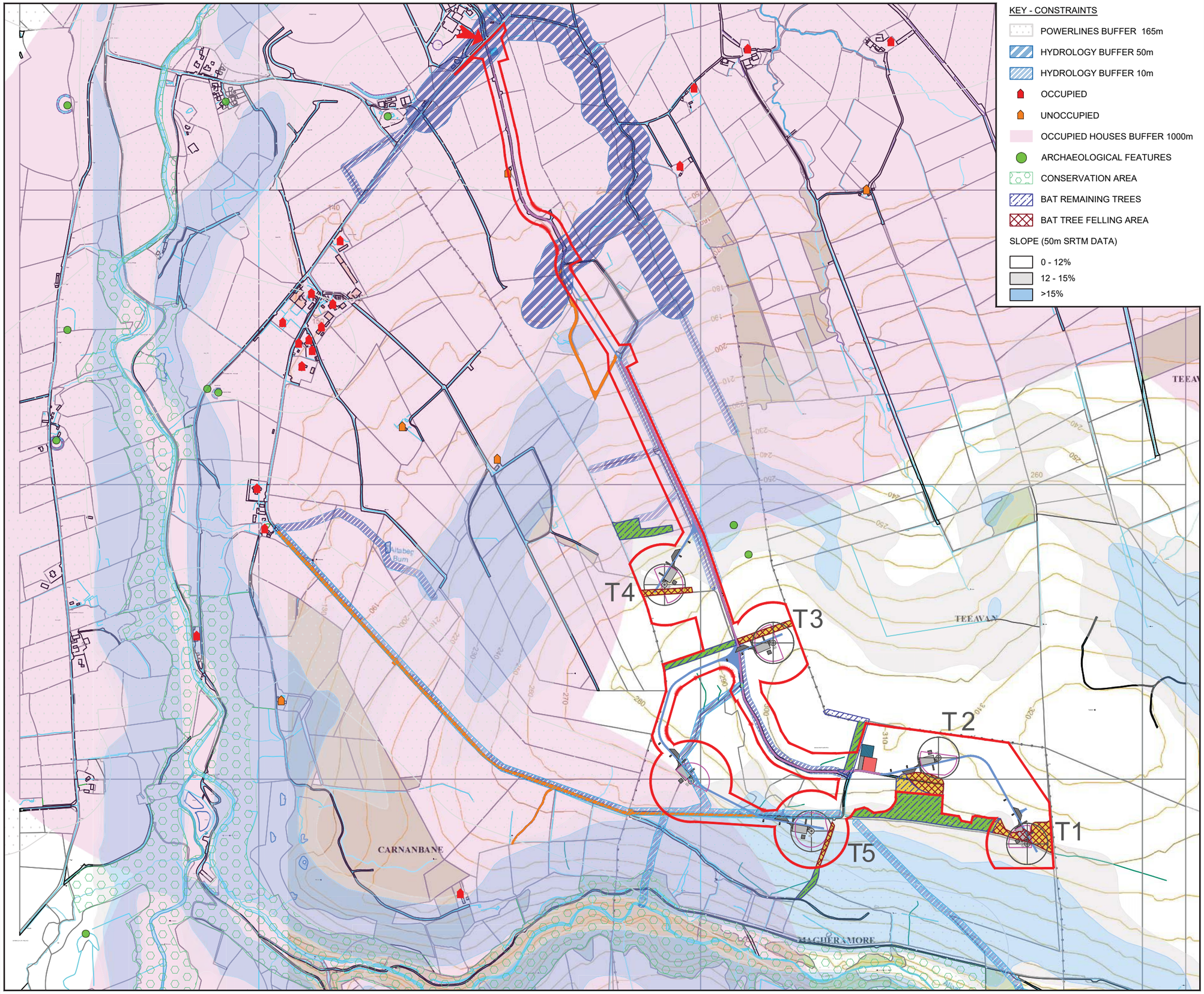
LAYOUT DWG	AS SHOWN	T-LAYOUT NO.	AS SHOWN

DRAWING NUMBER

03426D1002-01

SCALE - 1:15,000 @ A3

ENVIRONMENTAL STATEMENT



KEY - CONSTRAINTS

- POWERLINES BUFFER 165m
- HYDROLOGY BUFFER 50m
- HYDROLOGY BUFFER 10m
- OCCUPIED
- UNOCCUPIED
- OCCUPIED HOUSES BUFFER 1000m
- ARCHAEOLOGICAL FEATURES
- CONSERVATION AREA
- BAT REMAINING TREES
- BAT TREE FELLING AREA

SLOPE (50m SRTM DATA)

- 0 - 12%
- 12 - 15%
- >15%

MAGHERAMORE WIND FARM

FIGURE 3.3

COMBINED CONSTRAINTS & INFRASTRUCTURE

KEY - INFRASTRUCTURE

- PLANNING APPLICATION BOUNDARY
- WIND TURBINE LOCATION
- TURBINE MICROSITING
- NEW SITE TRACKS
- UPGRADED SITE TRACKS
- EXISTING TRACKS
- WATERCOURSE CROSSING
- CRANE HARDSTANDING AREA
  - PERMANENT
  - TEMPORARY
- TEMPORARY ENABLING CONSTRUCTION COMPOUND
- TEMPORARY CONSTRUCTION COMPOUND/ ENERGY STORAGE AREA.
- CONTROL BUILDING & SUBSTATION COMPOUND WITH PERMANENT HARDSTANDING AREA
- FORESTRY TO BE RETAINED
- FORESTRY TO BE REMOVED
- SITE ENTRANCE LOCATION

LAYOUT DWG	03426D0001-06	T-LAYOUT NO.	PNIRmgh020

DRAWING NUMBER **03426D2233-01**

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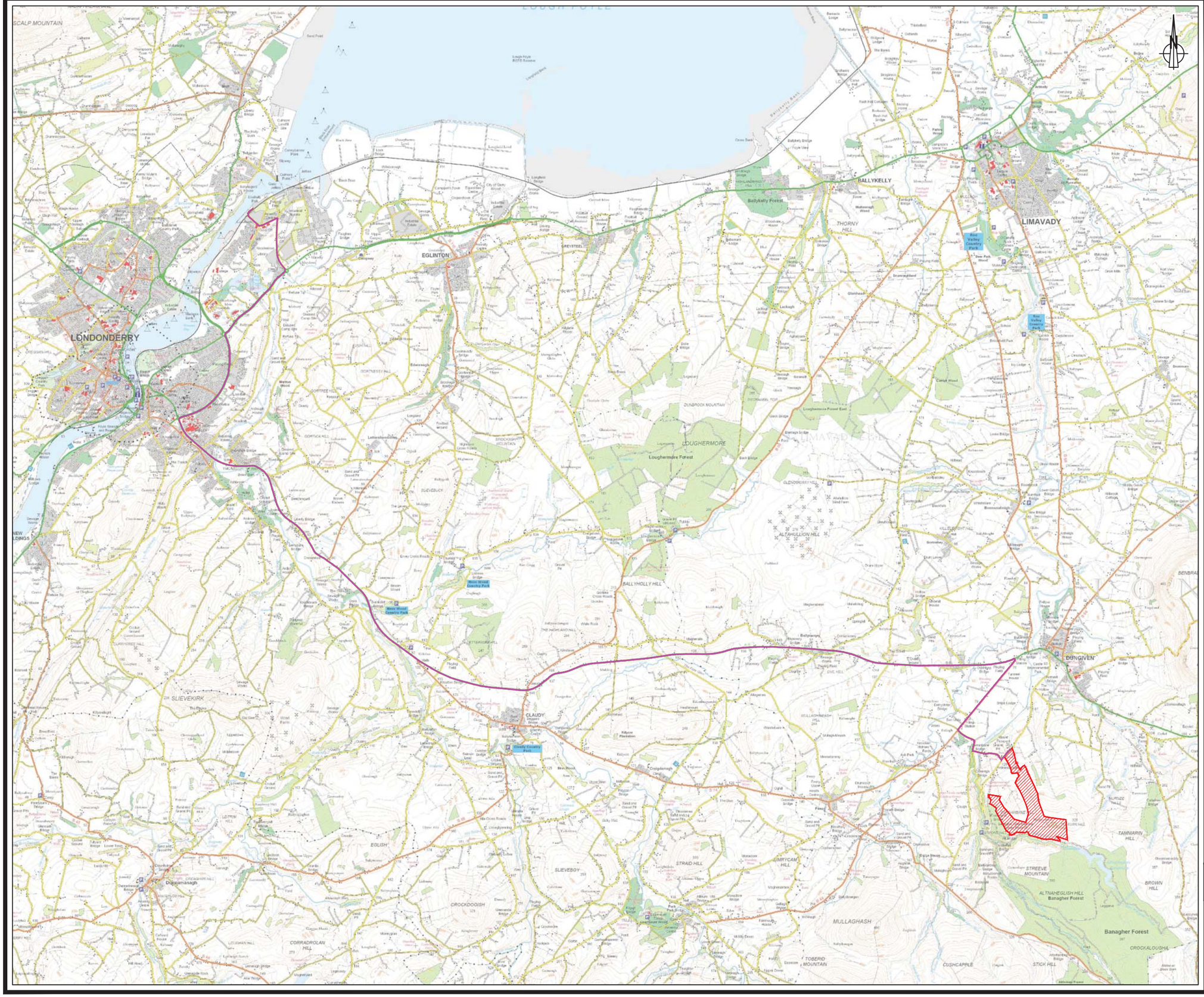
ENVIRONMENTAL STATEMENT



MAGHERAMORE WIND FARM

FIGURE 11.1

TURBINE DELIVERY ROUTE

KEY:

SITE

PROPOSED DELIVERY ROUTE

LAYOUT DWG	T-LAYOUT NO.
N/A	N/A

DRAWING NUMBER

03426D2509-01

SCALE - 1:100,000 @ A3

ENVIRONMENTAL STATEMENT

MAGHERAMORE WIND FARM

FIGURE 11.2

HGV ROUTE

KEY:

- SITE
- PROPOSED HGV ROUTE

LAYOUT DWG	T-LAYOUT NO.
N/A	N/A

DRAWING NUMBER

03426D2403-01

SCALE - 1:25,000 @ A3

ENVIRONMENTAL STATEMENT