This Design and Access Statement forms part of the planning application submissions, but does not form part of the Environmental Statement (ES).

Contents

1 Introduction

Section 42 of the 2004 Planning and Compulsory Purchase Act requires certain planning applications be accompanied by a Design and Access Statement. Government Circular 01/06: Guidance on Changes to the Development Control System[1] advises applicants on their form and content.

This statement has been produced in accordance with this advice and it describes the applicant's approach to issues of siting and design.

[1] DCLG 2006 (http://www.communities.gov.uk/documents/planningandbuilding/pdf/144854.pdf)

2 Site Selection

Severn Trent Water Limited (the Applicant) has a land portfolio comprising over 5,000 sites. All of these sites were subjected to Two-phase Sieve Analysis to identify those with the potential to accommodate a wind turbine. The sieving phases of the analysis comprised:

- Phase I Constraint Sieving: an assessment of direct effects upon areas of designated natural or built heritage and those areas technically constrained by virtue of low wind speeds, unsuitable topography or the lack of a suitable access,

- Phase II Proximity Sieving: an assessment of indirect effects by measuring the proximity of areas designated for there natural or built heritage, residential properties, transport routes, footpaths, bridleways and other sensitive land-uses.

A comprehensive list of the Phase I & II tests are included in the table below.

Environmental Indicator		**Phase I Constraint Sieving**	**Phase II Proximity Sieving**
1	Aviation	Consultation Zones of Civilian & Military Aviation Safeguarded Aerodromes, Technical Sites and Military Explosive Storage Areas.	Proximity to the site measured and potential impacts assessed.
2	Residential Amenity	500m exclusion zone. This distance chosen as a guide to mitigate against noise, flicker and overbearing impact.	Proximity to the site measured and potential impacts assessed.
3	Cultural Heritage	World Heritage Site, Registered Battlefields, Registered Parks & Gardens, Scheduled Ancient Monuments, Conservation Areas, Listed Buildings.	Proximity to the site measured and potential impacts assessed.
4	Landscape	National Designations (National Parks, Areas of Outstanding Natural Beauty).	Proximity to the site measured and potential impacts assessed.
5	Ecology	National Nature Reserves, RAMSAR Site, RSPB Reserve, Sites of Special Scientific Interest, International Bird Areas, Special Areas of Conservation, Special Protection Areas.	Proximity to the site measured and potential impacts assessed.
6	Infrastructure	Underground services, oil and gas pipelines and above ground radio-communication links.	Proximity to the site measured and potential impacts assessed.
7	Grid	Location of overhead power lines, nearest connection point together with an initial assessment of the impacts associated with the routing of a connection.	Proximity to the site measured and potential impacts assessed.

8	Access	Route assessment back to Trunk Road or Motorway.	None
9	Cumulative Effects	Plot the position of other turbines: • proposals in scoping, in planning and at appeal. • consented developments. • development in construction, built and operational. • refused proposals.	Proximity to the site measured and potential impacts assessed.
10	Water Environment	Potential for flood risk and proximity to watercourses.	Proximity to the site measured and potential impacts assessed.

Of the 5,000 sites subjected to sieve analysis 196No made it through giving rise to a 96% site mortality rate at this stage. The 196No were then tested for compliance with the Development Plan. 12No. sites emerged as sites of true potential, less than 1% of the original 5,000.

The majority of sites failed to negotiate a way through sieving analysis because of proximity issues with residential property, natural and built heritage designations or due to conflict with the character of the landscape.

The successful 12No sites were considered to be sites which on balance presented acceptable impacts on the environment. However, the Design Team recognised that assessments at such an early stage in the development process are made on the basis of many assumptions. The process of refining the layout and design of the site that follows on from its initial selection would always be iterative and constantly open to change.

Within the successful 12No sites was the Sewage Treatments Works at Curborough. Having identified the site as having true potential the issue of site design follows.

3 Design Principles & Best Fit

Planning Policy Statement 1: Delivering Sustainable Development, states that good design is a key element in achieving sustainable development. Good design is indivisible from good planning and high quality and inclusive design should be the aim of all those involved in the development process.

Design Principles establish a framework within which the optimum design for a site can emerge. Prior to the commencement of the design process for Curborough the following 6No. Design Principles were adopted.

1. **Scale:** should reflect the local landscape character, grain and scale.
2. **Minimise Visual Impact:** the layout shall minimise the visual impact of the proposal when viewed from the following recognised sensitive visual receptors:
    a. surrounding settlements or isolated farmsteads,
    b. designated areas of landscape importance or built heritage,
    c. formal recreational areas, designated foot, cycle and bridle paths, informal meeting areas and viewpoints of local importance,
    d. main transport corridors and tourist trails throughout the area.
3. **Balance Conflicting Needs:** the layout must balance the need to minimise environmental impacts with the need to maximise the generation of renewable energy and thus contribute towards the regional target for renewable energy.
4. **Minimise Visual Competition:** the layout should avoid awkward alignments with other key features in the landscape. This involves testing the design through consideration of the visual effects at key viewpoints to achieve the optimal design solution.
5. **Specification:** turbine selection must seek balance in terms of proportion to avoid ‘top heavy’ or ‘squat’ turbine appearance.
6. **Attention to Detail:** issues include wind turbine colour, the design and form of the permanent infrastructure and alignment of access tracks to ensure this relate to local landscape character.

The aim of the Design Principles is to promote a turbine type and layout that constitutes the environmental ‘best fit’ for the site.

4 Detailed Layout Design

To establish the environmental best fit for a site the relevant environmental constraints must be considered. They divide up into two groups and for Curborough they consist of the following constraints:

- Direct Physical Constraints
  - the routing of public rights of way within the site,
  - the presence of watercourses and surface water features within the site,
  - the presence of ecology within site,
  - the existence of operational treatment works plant and machinery.

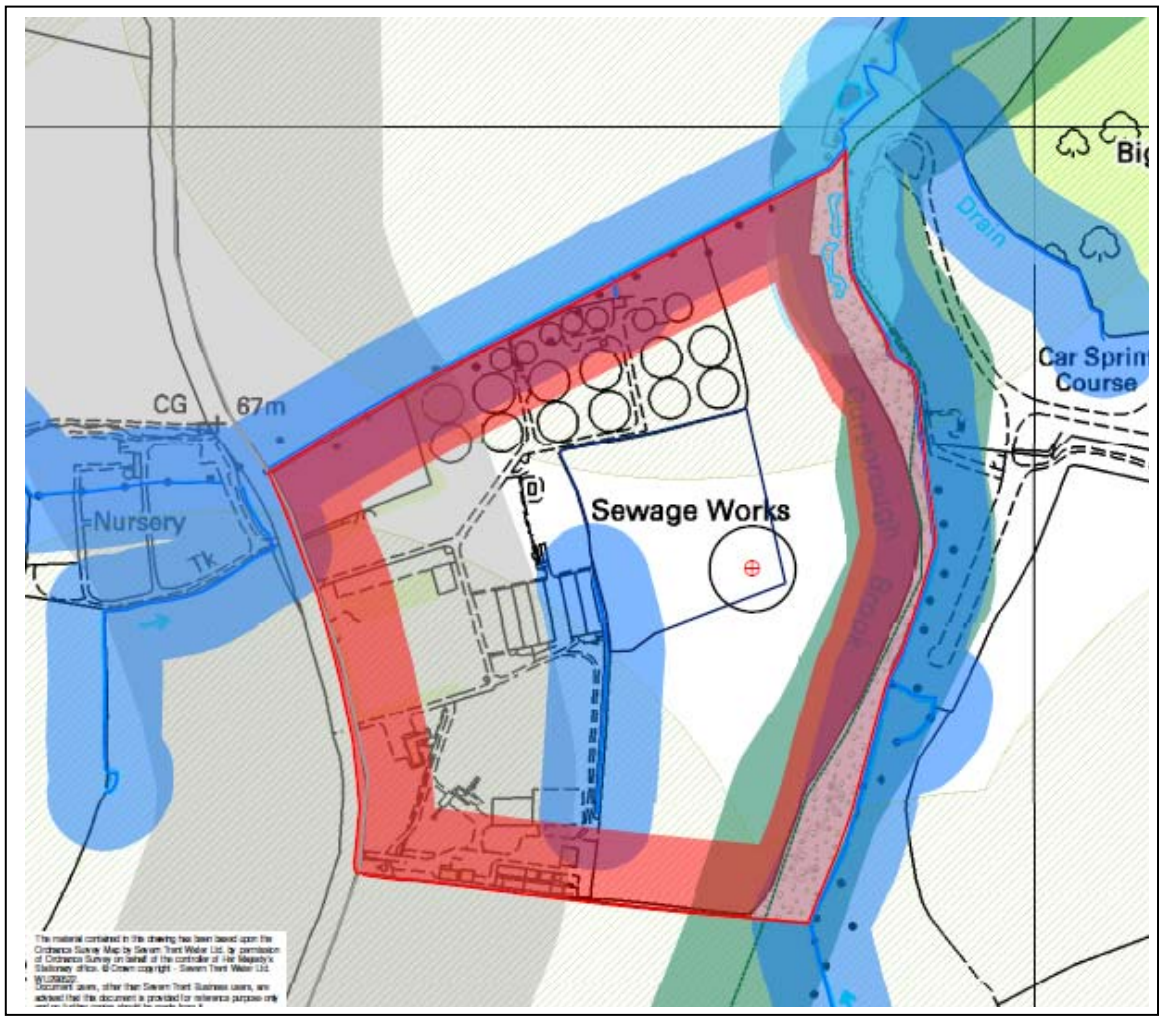
- Indirect Proximity Constraints
  - the proximity of neighbouring residential properties and the need to minimise the impact upon residential amenity,
  - the proximity of neighbouring public rights of way, road and rail routes and the need to provide for their specific operational buffer zones.
  - the proximity of neighbouring features of built heritage and the need to protect their setting.

Mapping environmental constraints allows a 'developable area' within the site to be identified. Figure 1 below shows the constraints applicable to Curborough that were identified and used in designing the proposal. A finalised constraints map incorporating the results of all environmental assessments is included at Figure 2.1, Volume 3 of the accompanying ES. The result is a single developable area within the site capable of supporting a single turbine.

A micro-siting allowance would be sought by way of an appropriately worded planning condition to allow the turbine position to be refined within this developable area should physical constraints be encountered during construction. Siting the turbine centrally within this area gives flexibility should any further constraints be encountered.

Having identified the sites capacity the issue of turbine design then arises.

Figure 1 Constraints Map



5 Detailed Turbine Design

Results of Phase I Constraint Mapping confirmed that the site was physically capable of hosting a single turbine. Results of Phase II Proximity Mapping confirmed the absence of any sensitive natural and/or build heritage and the absence of any neighbouring sensitive land uses likely to be the subject of significant adverse effects from the proposal.

Once satisfied that the proposal, at this early design stage, would not give rise to significant direct or indirect effects in close proximity of the site the Design Team then considered the effects of the proposal from greater distances. The most important consideration at distance is to 'best fit' the turbine type to the character, scale and grain of the landscape.

As a start point the Design Team considered the existing Landscape Character Assessment for the area as contained within Lichfield District Councils Draft Biodiversity and Landscape Supplementary Planning Document (SPD). Here the landscape character type is labelled as being of a 'Settled Farmlands' character type.

The SPD describes the Settled Farmlands landscape character type as suffering from a loss of characteristic semi natural vegetation. This is seen as a limiting factor on landscape quality. This is primarily due to the loss of ancient woodlands, hedgerows and semi natural grasslands. Based on this assessment, the landscape sensitivity is considered by the Design Team to be medium.

Then the team considered the scale of the landscape and concluded it to be of medium scale consisting largely of worked arable fields which have melted together over generations to provide the access necessary for modern farming machinery. As a result field sizes have increased and the amount of segregating hedgerows has reduced contributed to the loss of landscape character and biodiversity recorded by the SPD.

The topography of the area was assessed by the Design Team to be largely flat which in theory would give rise to long range views. However, this is often prevented by the presence of screening organic woodland and trees tracing transport routes, canals and watercourses across the whole area.

Finally, when considering turbine size, the sensitivity of the wider landscape should be balanced against the urgent need for renewable energy generation. Advances in turbine technology over the preceding decades mean that today a single modern turbine of 2.5MW can do the work of, say, the 9No turbines installed at Blyth Harbour in 1993 which had a total installed capacity of 2.7MW. The trade off however is that generating improvements have come as a result of an increase in turbine size.

Electricity generated by wind turbines increases disproportionately as wind speed increases and also as blade swept area increases. Therefore turbines with longer blades and which place those blades further from the ground access more wind energy than smaller turbines.

Therefore, based on the evidence that the:

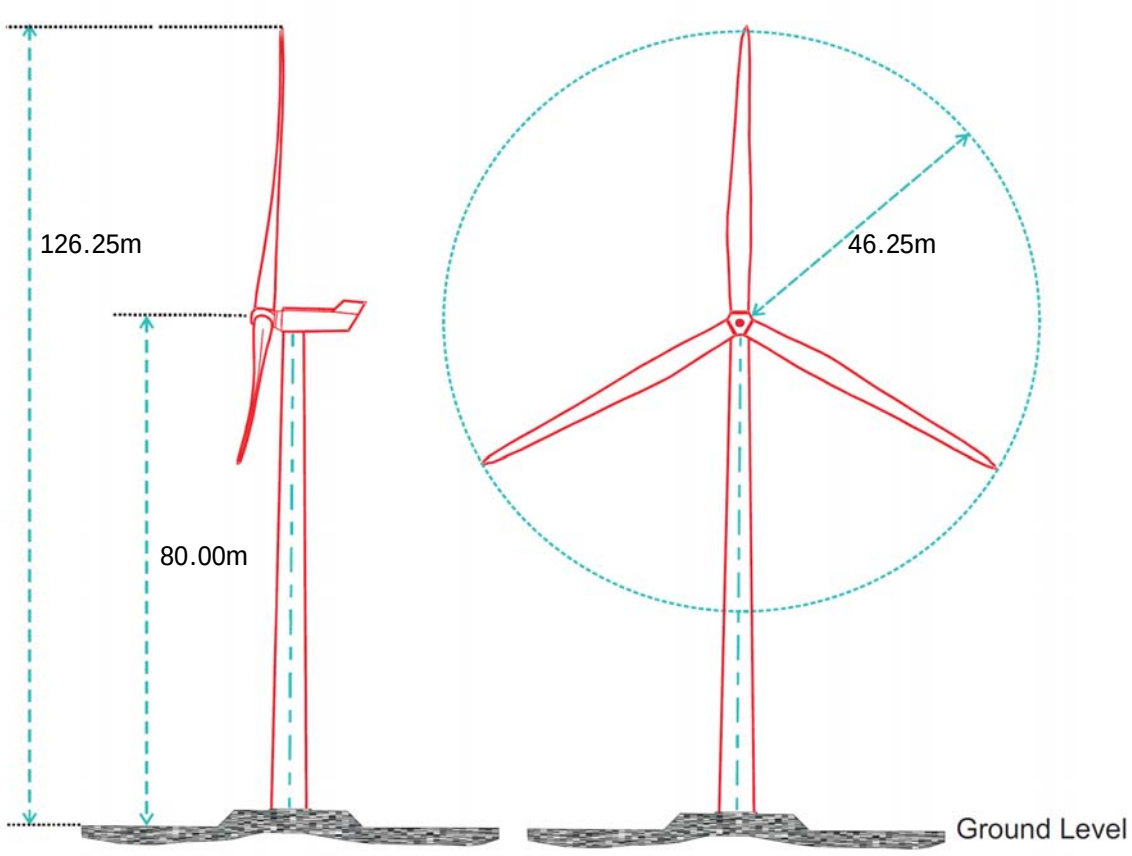
- Two-Phase Sieve Analysis confirmed the absence of any sensitive natural and/or build heritage and the absence of any neighbouring sensitive land uses likely to be the subject of significant adverse effects from the proposal;

- landscape sensitivity of the area surrounding the proposal is medium,

The Design Team concluded that the site would be capable of hosting a modern size turbine. The best fit turbine was considered to be within the design envelope of up to 80m to hub and 126.25m to maximum blade tip giving a blade diameter of up to 92.5m. The wind turbine will typically consist of a steel tower with three carbon fibre blades. The turbine colour will be a non-reflective matt white/grey typical of wind turbines throughout the UK.

This design envelope for the turbine ensures that the accompanying EIA process adopts a 'worst case' scenario approach and that assessment of effects are not therefore inadvertently understated. Furthermore, should a planning consent be issued, the envelope allows for a wide range of turbine types to be considered for final procurement.

Figure 2. A Typical Modern Wind Turbine Illustrating Proposed Maximum Dimensions



6 Detailed Component Design

6.1 Site Access and Tracks

The start point in planning for access was to utilise the existing transport infrastructure where possible to minimise the need for new development. Utilising Watery Lane helps to minimise the effect of access works upon the hydrology and ecology of the area. Navigation of the lane has been plotted in detail and the proposal has benefited from the guidance provided by Local Planning Authority Tree Preservation and Countryside Officers.

As a result, although the road-side hedge within Watery Lane would need targeted trimming and over-hanging trees would need to be pruned where necessary to allow for unimpeded access of delivery vehicles, the proposal would not require the removal of any living trees or protected hedgerow within Watery Lane. Removal has been limited to a section of hedge that encloses the treatments works. This loss would be mitigated by the fact that it would be:

- Temporary. Lasting only for the 4 months predicted for the construction phase; and,

- Reversible. A replanting strategy would be agreed with Local Planning Authority Tree Preservation and Countryside Officers prior to the commencement of construction to ensure the replacement of removed hedge with new hedge of suitable scale, specification and mix upon completion of site works. In this way the proposal would help maintain and enhance biodiversity within the lane.

As vehicles progress in a southward direction along Watery Lane they approach the proposed site entrance to the treatment works compound. At the point where vehicles position themselves to make the turn into the site it is proposed that the highway be extended into the highway verge.

Engineering of the junction in this way allows construction vehicles to access the site head on, minimising the need to remove boundary hedge. Looking north approximately 30m of protected/non protected hedge will require removal. Looking south, because the existing hedge is already set back from the edge of the highway it is considered that the hedge can be left in situ with only standard trimming required.

Upon completion of the construction phase the crushed stone would be removed and the land reinstated to its current condition. The re-modelled junction would then be used by turbine maintenance vehicles during the operational phase.

However, in the unlikely event of a major component failure such as a turbine blade or gearbox failure, then the upgrade to the site junction in off Watery Lane and the connecting track within the treatment works compound would need to be temporarily re-installed. This would be necessary to provide access for possible assembly cranes and turbine delivery vehicles. Upon completion of such activity, the temporary works would again be removed and the land reinstated to return it to its original appearance.

Re-instating in this way would allow the verge to return to its original state until the commencement of decommissioning in 25 years time when the extended highway would be re-introduced for a temporary period only.

6.2 Temporary Works

The proposal allows for a construction compound, a lay down area for turbine components and a hard standing area to support the cranes required for turbine assembly. It is proposed that the lay down and hard standing area would remain in situ for the life of the turbine.

All three areas would be clustered together within the existing treatment works compound and would therefore benefit from the existing remoteness of the site, its established screening from mature hedgerows and the security fencing in place. Taken together the characteristics of the site works to screen visual access.

Given that the temporary works would only be required for an anticipated 4 month construction phase and that they are located within the existing treatment works compound to minimise environmental, ecological and visual effects, the Design Team do not anticipate any significant effects to arise.

6.3 Grid Connection

The treatment works currently contains a small electrical substation. It is anticipated that the turbine would connect directly into this substation by way of two new small kiosks, one to house the sub-station and the other to house the turbine control equipment. Cables connecting the turbine to the substation would be buried within or to the side of the existing site tracks.

7 Appraisal of Context

Throughout the design process the Design Team considered the context in which the development would sit to inform decisions regarding the final siting and design of the wind turbine components. Government Circular 01/06: Guidance on Changes to the Development Control System[2] provides designers with a checklist of design concepts to be accounted for to ensure that the final design is the 'best fit' design. The design concepts for consideration are discussed in turn below.

7.1 The Physical Context

The site is an operational sewage works predominantly surrounded by areas of open countryside in agricultural use. West of the treatment works, separated from it by Watery Lane running north to south along the site's western boundary, lies a horticultural nursery. Approximately 300m to the east of the treatment works lies an open air sprint course consisting of a length of racing track and parking areas. The surrounding open countryside contains a number of wooded plantations to the north of the site.

The landscape character is assessed within the Lichfield District Councils Draft Biodiversity and Landscape Supplementary Planning Document (SPD) as being a Settled Farmlands type. The Design Team considers the sensitivity of the landscape to be medium.

The scale of the landscape is considered to be medium, consisting of large and flat worked arable fields. The presence of mature organic woodland and trees tracing transport routes, canals and watercourses across the area works to effectively screen long range views.

7.2 Social Context

The UK Government Planning Policy Statement 22: Renewable Energy sees renewable energy as part of a sustainable way of living that will best provide for 'long term health and quality of life and the protection of properties through mitigation of the effects of climate change'. However, the assessment of social benefit goes wider and should recognise the following additional and material benefits:

- Affordable Energy:
  The concept of 'fuel poverty' is with us. The prospect of further supply and restrictions and its effect on prices would impact on the vulnerable within our society, namely the elderly, young and low income families. This proposal will help diversify our energy base and reduce our exposure to supply restrictions.

[2] DCLG 2006 (available online at http://www.communities.gov.uk/documents/planningandbuilding/pdf/144854.pdf)

- Food Security:
  Global and local agriculture will face many challenges over the coming decades as a result of Climate Change. Rural communities will have to adapt and adopt new farming methods which may not be easy and therefore food supplies may be threatened.

- Human Health:
  Public health depends on sufficient food, safe drinking water, shelter, good social conditions and a suitable environmental for the control of infectious diseases. All of these factors could be affected by Climate Change.

- Human Settlements:
  Climate Change would affect human settlements. Infrastructure would become more vulnerable to flooding and landslide. Water supplies would be affected by the alternate drying and flooding of extreme weather events. The threat of fires and heat waves would affect human health and productivity.

All of these events have occurred across Europe since 2000 most notably the heat waves across France in 2003, the forest fires across Portugal in 2005 and the flooding that routinely affects every European state. Climate Change contributes in all. This proposal would help tackle the causes of Climate Change by:

- Off-setting the generation of approximately 2,825 tonnes of carbon dioxide annually and approximately 70,625 tonnes over its anticipated life time of 25 years.[3]

- Providing enough clean renewable energy to power approximately 1,398 households annually[4].

One further aspect of the social context to consider is the core function of Severn Trent Water Ltd to provide a safe and clean water supply and water treatment service. This function is threatened by Climate Change and the onset of extreme weather events.

The uncertainty Climate Change generates is set to continue if nothing is done. To neutralise this threat Severn Trent Water Ltd regard renewable energy as part of the solution. By:

- being more efficient with energy use across the whole company;

- generating renewable energy from its own systems such as energy from waste, hydro sources, energy crops and anaerobic digestion; and,

- off-setting the energy traditionally drawn in from fossil fuel burning power stations with new forms of renewable energy generated from zero emission technologies such as wind turbines,

[3] Calculated based on a figure agreed with the ASA by BWEA of 430g of CO_2 produced per KWh of electricity generated from our current fossil fuel mix. The CO_2 estimate for the lifetime of the development is an estimate and is subject to an approximate margin of error of 5%.
[4] Based on the BWEA recommended average annual UK household electricity consumption of 4,700KWh.

Severn Trent Water Ltd believe they can make a meaningful contribution in reducing the amount of carbon released into the atmosphere which in turn would help stabilise climatic conditions and help secure a safer future for both water supply and treatment services.

7.3 The Economic Context

At the local level, construction of the proposed wind turbine would result in a small direct positive economic benefit for local service companies. On a national scale there would be economic benefits resulting from job creation and investment cumulatively with other wind energy projects.

On a wider level, the proposal will assist with the UK Government's aim of encouraging indigenous energy generation to give security of supply. The UK's dependency on external energy continues to increase. Such dependency and the accompanying lack of control over supply and price places the UK economy, its manufacturers and service providers in an increasingly vulnerable position.

7.4 The Planning Context

Planning policy is discussed in detail in the Planning Statement which forms part of this submission. The relevant policy for consideration is contained within the Development Plan for the area which for Lichfield comprises:

- The West Midlands Regional Spatial Strategy (adopted June 2004);
- Staffordshire and Stoke-on-Trent Structure Plan (adopted May 2001); and
- Lichfield District Local Plan (adopted June 1998).

While the county and district plans have many policies in place to control the impacts of development the most relevant and therefore dominant policy in place is policy EN1: Energy Generation as contained within the West Midlands Regional Spatial Strategy.

It relates to renewable energy schemes and seeks to inform emerging local authority development plans. The policy tasks local authorities with encouraging renewable energy development, including onshore wind power, and sets out criteria which should be used in assessing the impact of such proposals.

The application of policy EN1 should also be considered within the framework of national planning statements issued by the UK Government. The most relevant Planning Policy Statements are PPS22: Renewable Energy, PPS1: Delivering Sustainable Development and PPS1 Supplemental: Planning and Climate Change. All three statements encourage urgent action to promote the growth of renewable energy generation.

8 Involvement

Severn Trent Water Ltd has maintained community awareness throughout the planning process in line with the programme for community engagement, included within their Statement of Community Involvement, submitted to Lichfield District Council in March 2009. The approach ensured that the views of all statutory and non-statutory consultees, local organisations and the local community were considered in formulation the schemes siting and design decisions.

The commitment to communication with statutory and non statutory consultees was maintained through the formal Environmental Impact Assessment scoping process and during the production of the Environmental Statement. In addition, a public exhibition was held on the 29th April 2009 at Curborough Hall Farm to enable the local community to comment on the proposal, raise any issues and have their questions answered. Feedback from this exhibition was collected, analysed and is discussed in detail within the ES.

9 Evaluation

The design process is an iterative one. Draft designs are made at all stages as the project matures. The design may change as it tries to accommodate new technical and/or environmental information that may result in new constraints. Therefore the design should remain fluid and responsive up until the point of Design Freeze.

Design Freeze is the point where the Design Team considers it has sufficient information to fix the components triggering the start of the impact assessment stage. In the case of Curborough, the freeze only occurred following confirmation that the:

- Two-Phase Sieve Analysis found an absence of any sensitive natural and/or build heritage and the absence of any neighbouring sensitive land uses likely to be the subject of significant adverse effects from the proposal,

- Draft Lichfield Landscape and Biodiversity Supplementary Planning Document considered the landscape quality of the Settled Farmlands landscape character. Based on this assessment the Design Team considered the landscape sensitivity to be low.

- Feedback from the programme of community involvement as documented within the Statement of Community Involvement had not given rise to any anticipated significant new effects.

Based on the streams of evidence above, the Design Team concluded that the site would be capable of hosting a modern size turbine, the best fit turbine being considered to be within the design envelope of up to 80m to hub and 126.25m to maximum blade tip giving a blade diameter of up to 92.5m.

10 Design

Scheme design has been a direct result of the assessment of the site's immediate and wider context, the involvement of stakeholders and professionals throughout the process and the evaluation of information collected and feedback received. Key aspects of the siting and design approach can be summarised as follows:

- Sustainable Design: the proposal utilises a previously developed site and all of its existing on site infrastructure such as access tracks and lay down areas. Furthermore, this approach of using existing transport infrastructure, in the form of Watery Lane, has reduced the need for new permanent development off site making the proposal as prudent with resource and sustainable as possible;

- Site Selection: the Two-Phase Sieve Analysis has allowed the Design Team to select sites in a sensible and responsible manner; and

- Design Principles: the adoption of principles at the very start of the planning process has allowed the Design Team to make decisions that minimise the environmental impact and ensure that the proposal is the environmental 'best fit' for the host site.

11 Access

Access to the site is gained off Watery Lane via Wood End Lane and the A38 Burton Road. This route currently serves the existing sewage treatment works. The main transportation impacts of the site will be associated with the movement of:

- Heavy Goods Vehicles (HGVs): during the construction phase of the development. Construction of the turbine will require the delivery of large items of plant and equipment as well as materials necessary for turbine foundations, hard standing areas and access track.

- Turbine Delivery Vehicles (TDVs): blades, tower sections and nacelles will be delivered to the site using specialist vehicles comprising multi-axelled low loaders.

An Access Report detailing the routes for both HGVs and TDVs is included within Appendix I of the accompanying ES. Routes for both TDVs and HGVs are detailed within Chapter 11 of the ES.

An enhanced site access in off Watery Lane is proposed which will include visibility splays sufficient to allow the safe access and egress of HGVs and TDVs during construction. It will also ensure the safety of existing highway users. A small amount of hedgerow surrounding the site entrance would need to be removed to create the necessary sight visibility splays but upon completion of the construction phase the hedge would be re-instated and the ground restored.

During the operational phase very few vehicle movements are anticipated and the impacts during decommissioning would be less than those experienced during construction. Maintenance staff will park on the site when access to the turbine is required.

11.1 Inclusive Access

The design will not provide for disabled access as this is not relevant to the proposal given its industrial nature. The development will not be accessible to the general public and will be maintained by a team of dedicated engineers.