Brockaghboy 2 Windfarm

Drumbane Road, Garvagh, Co. Londonderry

EIS Volume 3

Non-Technical Summary

June 2014

contents

Computer-rendered photomontage of the view from the outskirts of Swatragh -

introduction

This non-technical summary (NTS) has been prepared by Brockaghboy 2 Windfarm Ltd. c/o TCI Renewables Ltd (TCIR) to accompany its application to the Planning Service for planning consent to construct a wind farm comprising four wind turbines and associated works. The proposed development lands are located to the west of Dowlins Bridge, on the Drumbane Road, approximately 7.5km South of Garvagh, some 800m inside the North east corner of the Sperrins AONB. The development will be on either side of the Drumbane Road and immediately adjacent to the approved wind farm development at Brockaghboy (C/2007/1186/F), which will see the eventual construction of 15 turbines of 125m height. Three of the proposed turbines are within Magherafelt Council area and one turbine is within the Coleraine Borough Council area.

Site Address: Brockaghboy 2 Windfarm
Land approx. 1.76 km south of Dowlins Bridge
Drumbane Road, Garvagh
Co. Londonderry

The NTS provides a description of the Environmental Impact Assessment (EIA) and has been produced in accordance with the *Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2012*. It contains an analysis of the environmental implications of the proposal to construct, operate and decommission the Brockaghboy 2 Windfarm.

The ES has been prepared by members of the TCIR in-house technical and development teams, with input from expert consultants and specialist contributors. The NTS is accompanied by two other volumes (1 and 2) which together form the complete Environmental Statement.

- Volume 1 Environmental Statement
- Volume 2A General Figures
- Volume 2B Landscape and Visual Impact Assessment Figures
- Volume 2C Technical Appendices
- Volume 3 Non-Technical Summary

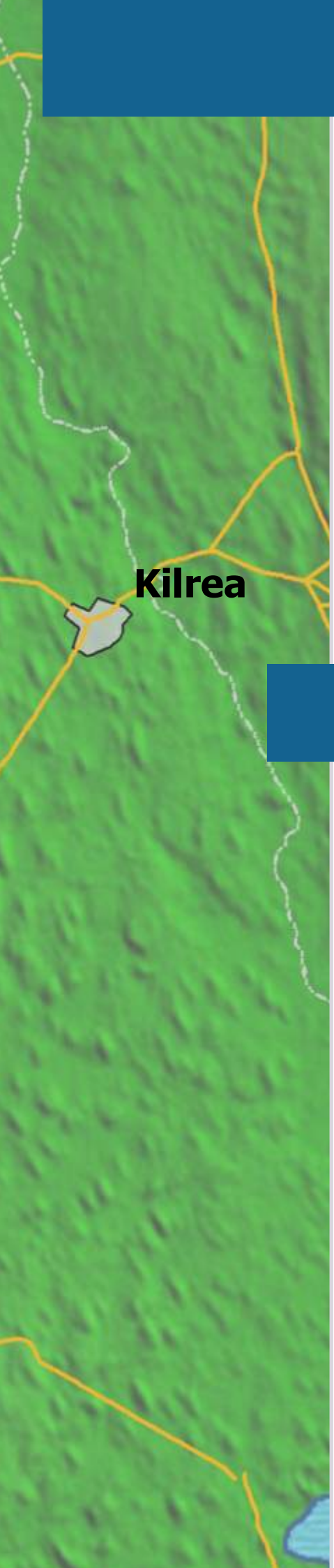
The full Statement has been submitted to DoE Planning NI Headquarters, where it can be examined by members of the public during normal working hours. Copies are also available for purchase - see Page 23 for details. Copies of the Non-technical Summary and the Environmental Statement (including figures) can also be purchased in print or CD form from:

TCI Renewables Ltd.
The Old Throne Hospital,
244 Whitewell Road,
Belfast BT36 7EN

A copy of the NTS can be downloaded free as a PDF file from the TCIR web site (www.tcirenewables.com).


Ringsend
Aghadowey
Garvagh
Brockagh
B64
B64
Drumbane Road
A29
Brockaghboy
Windfarm
Benbradagh
4
Brockaghboy 2
Windfarm
Swatragh
B75
Carntogher
The Ulster Way
The Glenshane Pass
Maghera
A6

the site



The proposed development site is accessed from the Drumbane Road, approximately 7.5km south of Garvagh, County Londonderry. The Northern Ireland Landscape Character Assessment places the proposed development lands within LCA39 – Glenshane Slopes, assessed to have high sensitivity to change from wind farm development. The proposed wind farm will extend the already approved Brockaghboy Windfarm (Planning reference C/2007/1186/F). All residential properties are located at distances greater than 570m from the closest turbine.

The base elevation of the Brockaghboy 2 turbines varies between 240 m and 265 m above sea level. Wind speed measurements at the site indicate a viable wind energy resource with speeds of on average 8.4m/s, 80m above the ground surface. The lands are approximately 1.5km east of the Carn-Glenshane ASSI/SAC and investigations have proved that the works will not adversely affect the integrity of this designation. The development lands themselves are presently in use for the grazing of livestock. Watercourses within the proposed development lands drain towards the south and south west via an unnamed tributary of Craigavole Burn, an unnamed tributary of the Knockoneill River and The Green Water.

In designing the wind farm, the development team sought to minimise the potential for environmental impacts and land-take by utilising access tracks and infrastructure of the approved Brockaghboy Windfarm where possible.

the project

The wind farm will consist of four wind turbines up to 125 m high, each generating up to 3 MW (megawatts) of electricity. Other infrastructure will include underground electric cabling, road improvement works, a substation building, turbine foundations, bases and hard-standing areas, a meteorological mast, new tracks and upgrades to existing tracks, a temporary site storage compound (for use during the construction phase) and other ancillary site works associated with a wind farm development.

The specific wind turbine model has not yet been agreed, however the turbine structures will be of the same or similar standard design to those approved on adjacent lands - incorporating a tower, three turbine blades and all coloured matt grey.

The towers will be fixed to the ground on concrete foundations, up to 21 meters in diameter, which will incorporate the steel tower base. Turbine switch gear will be contained either within the bottom section of the towers or in external kiosks beside each tower. A hard-standing area/crane pad will be constructed adjacent to each turbine foundation.

Subject to the granting of planning consent and turbine procurement, it is anticipated that construction of the Brockaghboy 2 Windfarm will take between 9-12 months to complete. At the end of the wind farm's expected 25-year operational lifespan the turbines can be decommissioned and removed. Where practical, hard surfaces will be broken down and rehabilitated. Underground electrical cables will be de-energised and removed from the site.

Northern Ireland Electricity (NIE) will be responsible for the planning application and design of the grid connection route. The turbines will generate electricity at between 400 volts and 690 volts. This will be stepped up to 33 kV using transformers installed within the base of the towers. Underground and overhead cables will connect the wind farm to the most suitable NIE connection point.

Operations and maintenance are initially the responsibility of the turbine supplier. After the warranty period has elapsed, a suitable company will be contracted to ensure the wind turbines and site area are appropriately managed and maintained. The turbines will be monitored via remote Internet computer links to maintain optimum efficiency.

All wind farm planning applications in Northern ireland are currently processed through the DoE central planning system by the Renewable Energy Team within the Strategic Projects and Design Division at Planning NI Headquarters, Millennium House, Belfast.

Planning NI has determined that the Brockaghboy 2 Windfarm application should be assessed in accordance with *The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2012* and that it must be accompanied by an Environmental Impact Assessment.

In assessing applications, Planning NI is guided by the relevant development plan for the area and by a raft of planning strategies such as the Regional Development Strategy for Northern Ireland 2035 (RDS - 2012) and the Strategic Energy Framework (SEF - 2010). The SEF outlines that Northern Ireland is committed to a legally binding renewable energy target; where 40% of Northern Ireland's electricity consumption will be generated from renewable sources by 2020.

In reaching a planning decision, Planning NI must consider the degree to which a proposed development is in compliance with Planning Policy Statement (PPS) 18: Renewable Energy, published in August 2009, which sets out the DoE's requirements for all renewable energy developments and outlines factors that will be taken into consideration when reaching a planning determination. The proposed Brockaghboy 2 Windfarm has been designed in full policy compliance with this document and the associated Best Practice Guidance (BPG).

A description of landscape value, landscape character descriptions and guidance on landscape and visual Impact assessment are contained within the associated Supplementary Planning Guidance (SPG) to PPS18, published by the Department in August 2010. The requirements and recommendations outlined in these guiding documents have been considered in detail for the siting, design and impact assessment of the proposed Brockaghboy 2 Windfarm development.

the need for wind energy

The growth of the market for wind energy is being driven by a number of factors including the need for immediate action on climate change, security of energy supply and the rising profile of environmental issues. These factors have combined in many regions of the world to encourage political support for the industry's development and, in some countries, for targeted fiscal stimulus.

It is predicted that by 2030 the world's energy needs will be between 30% and 60% higher than current levels. The International Energy Agency (IEA) estimates that around 4,500 GW of new energy capacity needs to be installed before 2030, requiring investments of more than US$ 13 trillion (£8 trillion).

Just as energy demand continues to increase, supplies of the main fossil fuels used in power generation are becoming more difficult to extract and consequently more expensive. As a result, some of the major economies of the world are relying increasingly on imported fuel at unpredictable cost, sometimes from regions of the world where conflict and political instability threaten the security of that supply.

According to figures released by BP in their Statistical Review of World energy, energy consumption grew more sharply in 2012 than in any year since 1973. Global energy consumption rose by 5.6% and the demand for oil, coal and gas was stronger in 2010 than it had been in almost 40 years. This was accompanied by a rise in emissions of harmful greenhouse gases, which shot up more quickly than in the previous four decades.

As energy demand continues to increase, the main fossil fuels used in power generation are becoming more expensive and more difficult to extract. Some of the world's major economies are forced to rely on imported fuel at unpredictable cost, sometimes from regions of the world where conflict and political instability threaten the security of that supply.

Given Northern Ireland's location on the western periphery of Europe, with few indigenous fossil fuel resources, the country has a near 100% dependence on fuel imports to meet energy needs. This dependency creates uncertainty in terms of security of supply and exposes Northern Ireland to the volatility of world energy prices. In Northern Ireland, almost uniquely, there is cross-party political consensus that we need more renewable energy. The Strategic Energy Framework 2010 has set renewable energy generation targets of 40% of energy from renewable sources by 2020. Renewable energy developments such as the Brockaghboy 2 Windfarm are vital and will make meaningful contributions towards achieving this goal.

Wind power is a cost-effective technology and a reliable, non-polluting source of electricity that provides considerable opportunities for benefit to the environment and economy. The Brockaghboy 2 Windfarm will play an important role in diversifying Northern Ireland's mix of electricity production, and contributing to renewable energy targets at both local and national levels.

Computer-rendered photomontage of the view from Drumbane Road

community attitudes

A new wind farm will often generate public interest and debate. People want to know how the structures will look or how a wind farm will sound when it begins operation. Public opinions are generally positive.

A major new poll carried out by the Department of Energy and Climate Change (DECC) shows overall support for renewables, including wind farms, has strengthened during 2012-13. Recent media reports attacking the impact of wind farms and other renewable energy projects, appear to have had no discernable impact on public opinion. The survey of more than 2,000 people, completed in April 2013 found that public support for onshore wind power has reached a 12-month high and that public support for renewable energy has increased over the past year.

An Ipsos MORI poll, carried out for RenewableUK in April 2012, showed that around two-thirds (67%) of respondents are in favour of wind power in the UK. One in twelve (8%) are opposed with only 3% suggesting that they are "strongly opposed." These figures show that while there is a small but vocal anti-wind energy contingent, the public majority supports harnessing the UK's abundant wind resources.

Information about the Brockaghboy 2 Windfarm has been provided to key stakeholders from public and private bodies for advice and comment, including government agencies, local councils, DoENI, NIEA, Planning NI and local community groups.

A public information day was held in advance of the the application submission at the Glenullin Resource Centre, on the 24th of September 2013. It provided an opportunity for local residents to comment on and gain information about the proposal. The event was advertised in the public notice sections of The Mid-Ulster Mail, The Coleraine Chronicle, The Balllymena Chronicle, The Balycastle Chronicle and The Limavady Chronicle/ Northern Constitution. Attendees included local residents, landowners and a number of people who were strongly in favour of wind energy development.

So far, the response to the Brockaghboy 2 Windfarm proposal has been positive. We are confident that the level of support will grow as people learn more about the benefits the project will bring and its importance in achieving renewable energy targets of 40% by 2020.

For additional information please contact TCI Renewables directly (*contact details on Page 23*).

community benefits

Wind Farms deliver zero-emission renewable energy, assist in securing and safeguarding our energy supply and reduce our reliance on imported fossil fuels such as oil, coal and gas. These are the well-recognised benefits of wind energy. But there are other, more tangible positives to be gained from a successful wind energy project.

Approximately £12.4 million will be spent in delivering this wind farm, of which around 15%, or £1.8 million, will be spent locally on procuring services for development, financing, legal arrangements, delivery, construction works and sourcing materials, plant and auxiliary equipment. On-site works will provide employment during a period of up to twelve months and local contractors are ideally placed to tender for this work, which offers opportunities to diversify their business or build experience in the installation, operation and maintenance of wind energy and related electrical technologies.

In recognition of the commitment by communities to embracing wind farm developments, the Northern Ireland wind industry strives to ensure that a proportion of the benefits delivered by these projects are realised within the communities that host them. As a responsible developer, Brockaghboy 2 Windfarm Ltd welcomes the opportunity to work closely with the community to help deliver real and tangible benefits at a local level. Once the wind farm becomes operational, in line with the NIRIG Community Commitment Protocol (Jan 2013), a dedicated community fund will be set up where a minimum of £1,000 per megawatt installed will be paid annually, over the lifetime of the wind farm. The fund will be administered by an independent fund-management company in conjunction with the local community.

The development will also provide revenue generation for land owners and other financially associated parties. Each turbine installed within the Magherafelt and Coleraine Council areas is liable for the payment of rates. These are estimated to be worth up to £112,000 per annum, based on a rateable value of £17,000 per MW.

The operation of the wind farm further presents an educational opportunity for schools, local community groups and the general public in raising awareness of the value of local energy generation, farming diversification, energy conservation and sustainability - and even tourism, should it prove to be a visitor attraction.

The Brockaghboy 2 Windfarm will have a positive socio-economic impact on the area, boosting the local economy - particularly during the construction phase - and generating a significant, positive impact on community development.

strategic benefits

Based on Renewable UK figures for average UK household electricity consumption of 4,700 per kilowatt-hour (kWh), the Brockaghboy 2 Windfarm is projected to provide the equivalent annual electricity for up to 6,876 homes.

Electricity generated by the proposed development will feed into the national grid and displace conventional forms of electricity generation. Using the electricity-to-carbon dioxide conversion factors from DEFRA and the Carbon Trust we can predict the volume of carbon dioxide offset by the wind energy generated.

The proposed Brockaghboy 2 Windfarm development is projected to avoid annual equivalent carbon dioxide emissions of approximately 15,052 tonnes (based on offsetting coal fired generation - see footnote).

Onshore wind is already competitive in terms of cost compared with coal-fired plant - and as fuel prices rise and turbine costs begin to fall that competitive position will only improve. Currently, wind-energy generation costs at £1,300-£1,600/kW (see footnote) are more expensive when compared with gas at £650/kW. However a volatile wholesale market and unstable supply chain makes for an uncertain future for gas.

Besides these strategic environmental benefits there will be specific direct benefits to the local economy, including:

- Jobs during the construction and operational phases
- The purchase of local construction materials and the hire of plant and equipment
- The potential for maintenance contracts
- Potential diversification for local business
- Revenue for landowners and businesses financially associated with the wind farm
- The contribution to local government revenue via business rates.
- Additional benefits to other areas of the local economy (hotels, retailers and other businesses) arising from the temporary concentration of labour resources.

According to DECC, during in the 2011-12 financial year in Northern Ireland, £180 million was invested and 767 jobs created by the renewables industry and related professions.

(Guidelines to DEFRA's GHG conversion factors for company reporting, DEFRA 2007. www.defra.gov.uk/environment/business/envrp/pfd/conversion-factors.pdf).Renewable UK;

Wind Energy Generation Costs http://windcrop.co.uk/wp-content/uploads/2012/12/Wind-Energy-Generation-Costs.pdf

The design of the proposed Brockaghboy 2 Windfarm was undertaken with full knowledge of the habitats and species present on the site. Development constraints were applied to avoid areas of greatest conservation value and where construction works could result in adverse impacts to the environment.

Ecological studies and project development advice has been led by Dave Allen of Allen and Mellon Environmental Ltd. Dave is one of Northern Ireland's most experienced ecologists and field naturalists since moving to Northern Ireland from England to work for the RSPB in 1979. During the spring, summer and autumn of 2013, detailed assessments were made of local habitats, flora and fauna. These were accompanied by discussions and meetings with the Northern Ireland Environment Agency. The proposed wind farm has been designed such that no significant or adverse impacts will result to habitats or species of note or conservation value.

Flora and Fauna

Habitat mapping and assessment was undertaken over the course of the spring and summer of 2013. Habitats across the proposed development area were identified using JNCC Phase 1 classifications. Field workers recorded all priority habitats and species, taking special care to identify evidence of badger, otter, Irish hare, pine marten, Marsh Fritillary butterfly, Argent and Sable moth or smooth newt. The proposed wind farm has been designed to avoid habitat areas of ecological importance or conservation value.

PPS 18: Renewable Energy (August 2009) states, "*any development on active peatland will not be permitted unless there are imperative reasons of overriding public interest.*" Areas of remnant and cut-over Blanket Bog have been identified and avoided in the design of the proposed development. The proposed mitigation measures will minimise impacts and assist in the compensation for habitat lost under the footprint of the development. Hydrological mitigation, Habitat management and restoration plans will integrate and enhance what has been agreed as part of the approved Brockaghboy Windfarm.

Birds

Results from previous detailed bird surveys, for the now approved Brockaghboy Windfarm, indicted that this is not a particularly sensitive area for birds. In 2012, discussions with the NIEA determined the requirements for bird surveys associated with the Brockaghboy 2 proposal, which were undertaken between April and August 2013 in accordance with agreed methodology. The ornithological study comprised a breeding bird survey plus vantage point watches. Three species of high sensitivity were recorded at the proposed Brockaghboy 2 development lands during fieldwork – migrant golden plover, breeding red grouse and a non-breeding pair of curlews near the site. It appears unlikely that the extension proposed to the consented wind farm will have any increased impact on golden plover and curlew and it is predicted that the proposed extension will have no significant impact on the small population of red grouse in the area. Nevertheless, mitigation is proposed for red grouse with the suggested provision of medicated grit piles. Following these mitigation measures, the development is highly unlikely to result in any notable or significant impacts on the local bird population.

Bats

Separation buffers were applied during the design process to all features with potential habitat value to bats. A detailed bat survey was undertaken during the summer and autumn period of 2013. All survey work was carried out according to Bat Conservation Trust 'Bat Surveys Good Practice Guidelines' (2012) and NIEA Guidelines (2011). Reference was also made to a variety of best practice documents for wind farm bat surveys in Northern Ireland. Europe Static monitoring, using two SM2+BAT detectors, was undertaken on three occasions, for a minimum of five nights per session, from six different locations around the site between June 7th and September 24th 2013. For the transect work both surveyors used Bat Box Detectors wired to Zoom Recorders.

Bats occur across the site in small numbers, the most frequently encountered are common pipistrelle followed by Leisler's. During the transect visits most encounters were close to the roadside features, trees and hedges. The static bat detectors produced more data. As is typical in late August/September, bat activity across the site increased with bats presumably searching out mates (advertising calls recorded occasionally), wandering young bats and presumed migrants. Two Nathusius's pipistrelle passes were detected on the same night and were presumed to be migrants or local movers as no other contacts were made.

There is a lack of typical features associated with bat activity (such as hedge lines) within the proposed Brockaghboy 2 Windfarm area. The nearest hedge line and forest edge are more than 200 metres distant, along the bisecting Drumbane Road. Therefore, there is no focus for commuting bats to use for navigation or orientation in the vicinity of the turbines. The mitigation measures outlined in the Environmental Statement will ensure that any potential impacts to bats will be negligible. In conclusion, and based on current knowledge this would appear to be a site posing little risk to bats.

Landscape & visual assessment

To many people a wind farm is a positive sight, representing function and sustainable energy in an attractive form; a complementary addition to the landscape and views. However, wind turbines are large, visible structures and detailed consideration of their impact on the receiving landscape is a necessary inclusion in any comprehensive assessment. In most cases, the visual impact of a wind farm is a subjective response to its shape and form within the context of the landscape. Visual and landscape impacts are therefore not necessarily always negative.

The Landscape and Visual Assessments are separate but linked procedures. Landscape impacts describe changes in the physical character of the environment and how this is experienced. Visual impacts relate to the actual views and visual effects of the turbines when they are in place. Belfast-based company RPS Planning and Environment was commissioned to complete a Landscape and Visual Impact Assessment (LVIA) of the proposed Brockaghboy 2 Windfarm. This was undertaken by Raymond Holbeach BSc, MLA, MLI. Raymond is a Chartered Landscape Architect and Regional Director of RPS with over 20 years' experience including multiple LVIAs for wind farm projects in Northern Ireland.

To establish a thorough understanding of what the development will look like when built, a series of ZTV maps (Zones of Theoretical Visibility), wire frames and photomontage illustrations have been produced to simulate views from selected locations.

The ZTV maps are used to identify viewpoints from where the wind farm might theoretically be visible. Then, using turbine geometry and digital terrain data, a wire frame image of the surrounding terrain and the wind turbines is generated from each viewpoint using a standard proprietary software package. The wire frame and rendered model of the turbine is combined with a technically-verified baseline photograph from each location to produce a representative photomontage of what the viewer would potentially see of the development from that vantage point. All the maps and images are reproduced to scale and published as part of the LVIA in Volume 2B of the Environmental Statement.

Landscape Character Assessment

The starting point for the assessment is to gain a detailed appreciation of the existing landscape with reference to the Supplementary Planning Guidance PPS 18, published by the Northern Ireland Environment Agency. The locality proposed for development is described with reference to specific elements of the Landscape Character Area (LCA) in which it is located - in the north central portion of LCA 39:Glenshane Slopes. According to the SPG, LCA 39 has a high sensitivity to change from wind farm development, the topography is described to be of summits surrounded by steep ridges and slopes, along with deep branching gullies on upland edges, creating a largely open moorland landscape. The proposed wind farm, with four turbines of an overall height of 125 m, located on the eastern and lower slopes of Ashlamaduff Hill, is located within an area described as Open Upland Hills and Mountains.

Wind farms are already an integral component of the local landscape. The approved Brockaghboy Windfarm (15 turbines) characterises the immediate receiving landscape as one of wind energy generation, thus the sensitivity to change by the introduction of the proposed four additional turbines on adjacent lands is much reduced. In many views, the proposed Brockaghboy 2 turbines will appear to mesh with the approved Brockaghboy turbines. In no case will the proposed development introduce a new wind turbine element to the view.

Visual Impact Assessment

A total of 26 viewpoints have been assessed. The majority of the selected viewpoints have no significant visual effects. Moderate or substantial visual impacts have been predicted to result on the views from four viewpoints: Viewpoint 14 Drumbane Road; Viewpoint 15 Knockoneill Road; Viewpoint 16 Knockoneill; and Viewpoint 17 Tamnyrankin Tomb. These four viewpoints have been assessed as significant due to their close proximity to the proposed wind farm (less than 2 km). However, these views are already changed by the consented Brockaghboy Windfarm and introduction of the proposed Brockaghboy 2 Windfarm will not create significant additional cumulative landscape impacts beyond those created by the consented wind farm.

When the guidance set out in the Supplementary Planning Guidance to PPS 18 is considered, no significant landscape or visual impacts are predicted. The proposed Brockaghboy 2 Windfarm is broadly consistent with guidance for the location of wind farms in LCA 39: Glenshane Slopes. In this landscape and wind farm setting, the most notable visual impacts from the proposed development will be perceived within the context of the already-approved wind turbines at Brockaghboy. Though significant landscape and visual impacts will occur at close proximity to the proposed wind farm, the assessment establishes that with distance from the wind farm there is a greatly decreased level of landscape and visual impact.

A detailed cumulative visual impact assessment has determined that the proposed wind farm can be built without undue negative or lasting impact to the landscape and visual amenities of the area. The broader landscape character area and local visual resource are judged to have capacity to absorb a wind farm development of this modest scale. Whether these predicted changes are seen as negative or positive will depend on the perceptions and opinions of the individual experiencing the view. Overall, the proposal is considered to be acceptable in terms of significance of visual impact.

air and climate

Wind energy is a non-polluting source of electricity and will therefore have no direct negative impacts on the composition of the atmosphere. By displacing energy which would otherwise be generated through the burning of fossil fuels, the wind farm would in fact make a significant positive contribution to lowering harmful emissions to the atmosphere.

As we have already seen, though the turbine model has not been selected, the proposed Brockaghboy 2 Windfarm could result in the annual production of up to 12 MW of energy by renewable means, resulting in significant carbon savings as well as clean energy for at least 6,800 homes.

The energy generated by the proposed installation will help to displace energy generated by traditional, unsustainable means. This reduces the requirements for importing and burning fossil fuels such as coal, oil and gas, thus lowering harmful gaseous emissions to the atmosphere. The net result is a cleaner greener environment and overall better air quality

The Brockaghboy 2 Windfarm will also make a significant contribution towards achieving national targets set out in the Strategic Energy Framework 2010 which stipulates 40% of electricity to come from renewable energy sources by 2020.

The overall impact of the wind farm in relation to national and international air quality and climate concerns is notably significant and positive.

archaeology and cultural heritage

Archaeology consultants Northern Archaeological Consultants (NAC) were commissioned to assess the potential significance of impacts from the proposed development on archaeology and on the settings of archaeological monuments and features of cultural heritage in the wider area. The assessment takes into account the original use of the monuments, significant orientations, and modern land-use and the effect of the development on the original setting and public enjoyment of the monuments. NAC engaged in early discussions with NIEA to agree assessment methodology.

Assessment started with an initial desk-top survey to identify sites of importance within the local area. A site inspection was carried out to identify previously unknown or unrecorded upstanding archaeological sites. No archaeological heritage was identified within the site boundaries, or within the potential topple distance of the turbines. Therefore, no direct physical impact is predicted to result on sites of archaeological importance. No direct physical archaeological impacts of a definite nature have been identified to known sites or monuments in the region, and the mitigation measures outlined in the Environmental Statement would remove potential for significant adverse impacts on known or previously unknown archaeological remains.

With the approval of the Brockaghboy Windfarm on adjacent lands, wind turbines are not a new feature in the local landscape. Together these developments will see the eventual construction of 19 turbines of up to 125 m height. The presence of the approved wind development already characterises this locale. Thus the local landscape is not pristine but rather functions as a working, modern landscape featuring commercial forestry, agriculture, wind energy generation, housing, wooded field boundaries, electricity lines and roads.

Impacts to the cultural heritage sites will be of a visual nature only, relevant during the operational phase of the project. From many monuments, no more than marginal visibility of the proposed turbines will be possible, due to the shielding influence of topography and intervening vegetation or because the proposed additional turbines will appear within the spread of adjacent wind turbines. Correspondence and preliminary liaison was undertaken with NIEA: PHM and impact assessment has been tailored to allow a more detailed examination of potential for the development to visually impact on those monuments of regional importance with highest theoretical visibility of the proposed development, including the two State Care Monuments (Tamnybrack Court Tomb LDY026:052 and Tamnyrankin Court Tomb LDY026:013) in proximity, their current settings, and the likely impact of views of the proposed additional Brockaghboy turbines.

The potential for the proposed development to impact on the settings of these monuments has been assessed in accordance with PPS 6 and determined to be predominantly minor, with the two State Care monuments of Tamnybrack and Tamnyrankin carrying impacts of Minor and Minor/Moderate respectively, i.e. not of sufficient significance, such that refusal of the application should be warranted.

In conclusion, the archaeological settings analysis has determined that the Brockaghboy 2 turbines will not result in significant impacts on archaeological heritage. Should any archaeological remains be discovered during monitoring, these would be subject to full excavation/preservation in-situ as appropriate (in agreement with the NIEA:HMU). Ultimately, all potential impacts are reversible with the decommissioning of the turbines at the end of their operational life (around 25 years

Hydrology and Drainage

The assessment of soils, existing ground conditions, hydrology, geology and hydrogeology was undertaken by McCloy Consulting, an independent environmental consultancy specialising in the water environment, with expertise in hydrological and hydro-geological assessments, Sustainable Drainage Systems (SuDS), drainage assessment, mapping and management, watercourse modelling, and flood-risk assessment.

A desk-top study and detailed site-walkover survey were conducted. Works included consideration of ground stability issues, local hydrology and underlying geology. NIEA, the Met Office, Water Service of Northern Ireland and the GSNI were all consulted.

The proposed infrastructure is located on either side of the Drumbane Road. Topography of the development land to the east of the Drumbane Road is generally influenced by Drumbane Hill – the main infrastructure is located on the eastern slope of this hill with land falling from west to east. To the west of the road the proposed infrastructure is located on the south east slope of Crockdonnelloge Hill with land generally falling from west to east.

The hydrological setting of the site is based on the water-body catchments as defined by the Water Framework Directive: the unnamed tributary of Craigavole Burn, an unnamed tributary of the Knockoneill River and The Green Water.

A full assessment of water quality, and hydrological processes was carried out. It identified aspects of the design, construction and operation of the wind farm with potential for adverse impacts on the receiving geological and water environment. Site-specific impact avoidance and mitigation measures are proposed, including,

- Avoidance: Construction works will not be undertaken within proximity to the aquatic environment
- Design of site elements to minimise impact on the geological and water environment including avoidance of watercourse crossings where possible
- Implementation of a robust surface water management plan, tailored to the site and proposed development, comprising the use of SuDS (drainage) and silt management measures
- Comprehensive construction phase pollution prevention procedures
- Monitoring / validation of the mitigation methods will ensure their appropriate performance

The SuDS drainage methodology designed by McCloy Consulting has been used at many wind farms throughout Northern Ireland and has been extremely successful in the prevention of silt migration and pollution of watercourses during wind farm construction, operation and decommissioning. Implementation of the mitigation proposed eliminates or reduces the potential significance to all receptors to slight or neutral.

There are no potential impacts on the receiving geological, hydrological, and hydrogeological environments which cannot be adequately mitigated against and the Brockaghboy 2 Windfarm is considered acceptable as proposed.

Peat Slide Risk Assessment

Attention to ground stability is essential where construction will take place on peat substrates. Independent geotechnical experts Whiteford Geoservices Ltd. were commissioned to map peat depth and structure, assess the potential for peat slide hazard and risk and advise in relation to ground stability within the development footprint. Their leading consultant, John Whiteford, has more than 17 years of experience in the field of earth sciences, geotechnical engineering and management.

Investigations were carried out in accordance with best practice methodology defined by the Scottish Executive guidance - Peat Slide Hazard and Risk Assessment - Best Practice Guide for Proposed Electricity Generation Developments of December 2006.

Detailed surveys were carried out between March and October 2013, with peat-depth probing at each turbine base, hard-standing area, met-mast location and along the routes of planned access tracks and site entrances. The average soil peat depth encountered was 0.55 m. The development area is characterised by shallow peat and low slope gradients.

The detailed report concludes that all proposed turbines, access tracks and associated infrastructure offer “insignificant” risk of peat-slip or ground failure during construction and operation. No substantial hazards were identified within the proposed development area and the project can proceed, with adherence to the recommended mitigation measures allowing a minimum level of risk to be attained.

sound

Wind turbines generate sound as they rotate - caused mainly by the turbine blades passing through the air and, to a lesser extent, the working of the generator inside the turbine. Modern wind turbines are designed to minimise sound emissions and the nacelle, which houses the mechanical equipment at the top of the turbine tower, is sound insulated. Today's turbines are so quiet it is possible to carry out a normal conversation while standing at the base of a turbine.

TCI Renewables commissioned Parsons Brinkerhoff Ltd. to complete a cumulative noise assessment considering the sound levels from the proposed Brockaghboy 2 scheme, in conjunction with the nearby consented single turbines and Brockghboy Windfarm. The potential effects have been assessed in accordance with the best practice methodology as set out in government planning guidance.

Background noise data at the nearest receptors has been collected and analysed in accordance with current accepted practice, and noise limits have been derived, in accordance with the guidance document, ETSU-R-97 *Assessment and Rating of Noise from Wind Farms*, as referred to in PPS18, Renewable Energy.

The operation of the proposed Brockaghboy 2 Wind Turbines, both in isolation and cumulatively, is compliant with the ETSU-R-97 methodology, and meets the relevant ETSU-R-97 noise limits. This can be achieved and controlled by the council through a suitable planning condition based on the ETSU-R-97 limits described.

No significant noise levels are predicted at the nearest receptors from construction and decommissioning activities due to the distances involved. No significant change in traffic flow from construction activities is predicted. Significant adverse noise impacts are not anticipated to result from the proposed development.

shadow flicker

Shadow flicker occurs when the sun is low in a clear sky and shines through the rotating blades, casting a moving shadow on a nearby building or location. When it passes across a window, doorway or narrow space the shadow from each blade causes the light to appear to flick on and off.

By computing data on the geometry, location and latitude of the turbines and nearby properties - known as receptors in the analysis - the WindFarm software programme can predict a worst-case-scenario on the extent and duration of potential shadow flicker effects.

The analysis includes assessment of potential cumulative impacts at all properties within a 10 rotor diameter distance of the proposed Brockaghboy 2 site and the adjacent approved Brockaghboy turbines. No significant shadow flicker impacts are anticipated from the operation of the proposed Brockaghboy 2 Windfarm. It is not considered that shadow flicker will present any problems of annoyance or nuisance.

The PPS 18 Planning Policy Best Practice Guidance states that where the overall duration of shadow flicker falls below 30 hours per year or 30 minutes per day, it is not considered to be of significant impact. With regard to the flicker effect, the UK Updated Shadow Flicker Evidence Base, prepared by Parsons Brinkerhoff on behalf of the Department of Energy and Climate Change, concludes that *"the frequency of the flickering caused by wind turbine rotation is such that it should not cause a significant risk to health"*.

None-the less, in the event the wind farm is constructed and residents experience shadow flicker, the developer will implement appropriate mitigation measures in agreement with householders to remove any such adverse impacts.

tourism

Independent UK studies have consistently shown that fears about the negative impact of wind farms on tourism are unfounded. Surveys addressing this issue in the UK between 1992 and 2013 show that visitors are unlikely to be put off by the presence of a wind farm. While some people may be concerned, fears are generally eased when the development begins operation. In general, public reaction to these developments is tempered by knowledge of the value of wind energy in reducing emissions of greenhouse gases and improving diversity and security of energy supply.

In August 2011, the Northern Ireland Tourist Board (NITB) published a paper exploring visitor attitudes towards Wind Farms. Responses from tourists, both domestic and from the Republic of Ireland, illustrated that wind farms do not have a negative impact on tourism. The survey demonstrated that 52% of domestic tourists would be happy to visit an area which has wind farms, while 40% of RoI tourists also agreed with this statement. It also found that only 5% of domestic tourists and 3% of RoI tourists to Northern Ireland would avoid returning to an area that has wind farms.

The NITB concluded that the impact of wind farm development on tourism may not be as severe as previously thought and tourists, on the whole, seem generally positive or neutral to the prospect of wind farm development. To date, there is no published evidence to indicate wind farms have a negative effect on tourism. The Altahullion wind farm, north of Dungiven, features a dedicated tourist turbine, signposted from the main A6 Dungiven-to-Derry road by the NITB using brown tourism signs.

The effects on tourism from the Brockaghboy 2 Windfarm are difficult to quantify. However, it is considered that the proposed four-turbine extension will not make a significant difference to tourist attitudes and may even attract visitors to the area.

transport & haulage

Because of their unusual dimensions and weight, the turbine components (blades, turbine hub and tower sections) are classified as abnormal loads by DRD Road Service. It is intended that the Brockaghboy 2 turbine components will be delivered to the Lisahally port, outside Derry and transported along public roads to the site.

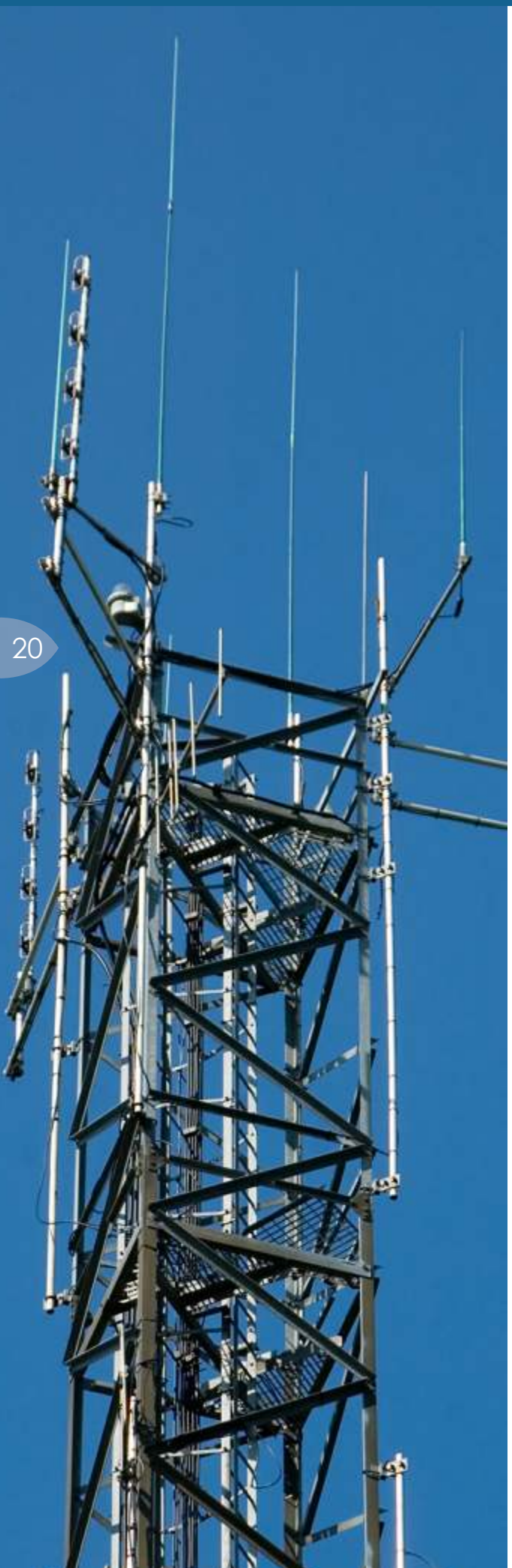
The same route used for the transportation of the Brockaghboy turbines (being constructed at the time of publication) will be used again to deliver the materials for the proposed Brockaghboy 2 Windfarm. Detailed road surveys and liaisons with the turbine component hauliers have confirmed this as a suitable route and it has been agreed as acceptable by Roads Service.

A relatively small number of oversized loads will be needed to transport the blades, towers and heavy turbine components. Locations on the public roads have already been identified where minor, temporary road works will be required. Other construction materials, including stone and concrete, will be sourced where possible from the local area and delivered in standard stone lorries and cement trucks. These vehicles will not normally require special traffic provisions on public roads.

The Environmental Statement provides a detailed description of the delivery routes, outlines the traffic-management procedures for local roads and details an approximate breakdown and schedule of the number and size of vehicles associated with the construction, operation and decommissioning phases of the development. The haulage route and traffic assessment report concluded that the local transport network will be able to absorb these additional traffic movements.

Transportation will be undertaken in association with traffic-management procedures, agreed with Roads Service in advance of construction, to ensure maximum safety and minimise potential impact on local residents and road users.

electromagnetic interference & aviation



As with any large structures, wind turbines have the potential to interfere with electromagnetic signals, such as television, civil and military aviation activities, communication, microwave links and radar. The turbine construction phase must include provisions for safeguarding existing aviation and ground based telecommunication infrastructure.

TCIR has consulted extensively with public and private telecommunication operators to establish the electromagnetic environment within and around the Brockaghboy 2 development. Each turbine location has been carefully selected to avoid potential interference with existing and future planned radio broadcast communication equipment. Details of the currently proposed Brockaghboy 2 Windfarm have been communicated to and agreed with telecommunication operators, such that adverse impacts are not anticipated.

In the unlikely event that impact to residential television reception occurs once the turbines begin operating, the wind farm owner will put remediation measures in place to restore normal service. Remediation measures may include the restoration (or even improvement) of TV reception by the redirection / replacement of domestic TV aerials or installation of alternate service provision facilities.

Aviation

Belfast International Airport, George Best Belfast City Airport, City of Derry Airport and the Civil Aviation Authority were consulted in relation to the wind farm proposal. The operator for each airport has confirmed the proposed Brockaghboy 2 development poses no risk to management or Air Traffic Safety or Control.

safety assessment

There are a number of potential hazards and risks that might be associated with the construction and operation of any wind farm. All statutory health and safety requirements and planning conditions will be adhered to during the construction, operational and decommissioning phases of the project.

Fencing will be erected at potentially hazardous zones within the wind farm construction area, machinery stored on site will be within an enclosed compound. All unattended machinery will be immobilised to prevent unauthorised use. All potentially hazardous materials will be managed in accordance with The Environmental Protection (Duty of Care) Regulations 1991. Access into turbine towers will be locked at all times, except when in use by authorised operation or maintenance personnel. Temporary construction safety signs will be erected in the most appropriate locations.

The lands on which the wind turbines will be sited are privately owned and unauthorised access to the wind farm site will not be permitted. Public access to the site will be strictly regulated. All site users, including staff, visitors, working personnel and the landowner, will be inducted with the necessary health and safety provisions.

The wind turbines will be equipped to operate automatically. The turbines will be installed with sensors to detect potential operation or generation issues including faults and voltage irregularities. Should a significant irregularity or technical fault be diagnosed, the individual turbine or wind farm will be halted until the issue can be addressed and resolved.

The construction, operation and decommissioning of the development will be completed in accordance with all relevant health and safety legislation and guidelines and by regulating public access.

Decommissioning

Wind turbines have an operational life time of approximately 25 years. At the end of that period, the site will be reinstated in accordance with a site decommissioning and reinstatement method statement which will be prepared for agreement with the Planning Service at least six months prior to decommissioning.

Turbine blades and towers will be dismantled and removed from the site. Where practical, hard surfaces will be broken down and rehabilitated. Hard-standing areas and any tracks that are not to be utilised by the landowner will be covered by topsoil and re-seeded. Underground electrical cables will be de-energised and removed from the site. All works will be carried out in accordance with an agreed decommissioning plan.

conclusion

This non-technical summary has outlined the findings of the Environmental Impact Assessment for the proposed four-turbine, up to 12 MW, Brockaghboy 2 Wind Farm development. Full details are set out in the Environmental Statement and accompanying technical appendices.

The Brockaghboy 2 site was selected for its reliable wind resource, accessibility, suitable topography and land area, compliance with noise requirements and distances from dwellings. A rational and rigorous assessment of the strengths, weaknesses and visual impacts of various alternative options has produced a design which is in full compliance with environmental planning policies and requirements and which makes optimal use of the available lands and wind energy resource, while minimizing potential for adverse environmental impacts.

The Environmental Impact Statement has demonstrated that lasting social, economic and environmental benefits will arise from this development. Visual and landscape impacts of the Brockaghboy 2 Wind Farm will be non-permanent, almost entirely reversible and associated with the medium-term, 25-year projected life span of the proposal. Wind farms are viewed by many, as positive additions to the landscape. Potential adverse effects of the wind farm can be managed through the application of appropriate mitigation measures, best practice management, training and construction techniques.

Comprehensive assessments of potential environmental impacts, carried out by respected experts in their fields, have concluded that the benefits to the environment and the local community of the Brockaghboy 2 Wind Farm will far out-weigh any potential perceived temporary changes to views and landscape character. The wind farm will offer tangible local financial contributions and provide much-needed opportunities for rural diversification. It reduces our reliance on imported fossil fuels, increases the security of our energy supply and helps towards the meeting of renewable obligations.

Permitting this development is therefore an imperative. The Brockaghboy 2 Wind Farm presents an opportunity to generate energy from an infinitely renewable source, in a non-polluting manner, in a suitable landscape setting, generating financial and environmental gains which are considered to be of over-riding public interest in the current economic climate.

The development has been designed in full compliance with planning and environmental requirements, as primarily laid out in Planning Policy Statement (PPS) 18: Renewable Energy, as well as UK and EU Energy Policies. In planning and environmental terms, the Brockaghboy 2 Wind Farm is judged to be acceptable at this location.

further information

The Environmental Statement can be purchased from the TCI Renewables office in Belfast, and the Post Office in Garvagh:

TCI Renewables Ltd
The Old Throne Hospital
244 Whitewell Road
Belfast, BT36 7EN

T: + 44 28 9037 1122

Garvagh Post Office
70 Main St, Garvagh
Coleraine, BT51 5AE

T: + 44 28 2955 8208

Purchase prices for the Environmental Statement:

	Price Excl. P&P	Price Inc. P&P
Fully bound paper copy of Volumes 1, 2 and 3	£150.00	£160.00
Paper copy of Volume 1 (Environmental Statement)	£60.00	£70.00
Paper copy of Volume 2 (Appendices A & B A3 Full Colour)	£78.00	£88.00
Non-Technical Summary - Volume 3	£6.40	£7.00
Electronic copies - Full Environmental Statement on CD	£5.00	£6.00

The full Environmental Statement can also be inspected free of charge at the following locations:

Strategic Planning Office
Planning Group
Causeway Exchange
1-7 Bedford Street
Belfast, BT2 7EG

T: 0300 200 7830

Magherafelt District Council
50 Ballyronan Road,
Magherafelt,
BT45 6EN

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Coleraine Borough Council
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Glenullin Resource Centre
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Computer-generated rendered image of the view from Garvagh

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