

SLDC development proposals for the village of Brigsteer

A Sustainability Assessment

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Foreword

The sections in this report follow the format required by the EU in the [*Strategic Environmental Assessment \(SEA\) Directive*](#) (2001/42/EC). Assessments of this nature are required for major projects and must include all aspects of the environment that may be affected by the development, such as populations, fauna, flora, air, soil, water, humans, landscape, and cultural heritage.

The author has prepared this report because the Sustainability Appraisal published by SLDC is relatively simplistic in its approach and does not address the wider issues.

1. Description of the Project

The Project under consideration is the proposal by South Lakeland District Council to build new dwellings in the village of Brigsteer. Full details are available at the following url: <http://www.southlakeland.gov.uk/services/environment-and-planning/planning/local-development-framework/allocations-of-land-dpd.aspx>

In summary, 1 site is identified for development, including affordable housing.

The site is identified as Land opposite Wheatsheaf car park (RN213).

The project will involve the planning, construction and consequent occupation of the dwellings.

Environmental inputs at the planning stage are limited to site survey and office-based design and contract let.

The Construction Phase will involve the following activities which will be sources of environmental disturbance:

- Clearance of mature woodland and loss of habitat
- Re-routing of existing overhead and underground power lines
- Groundwork, site levelling, roadways for site access, excavations for septic tanks, rain water storage, and potentially, boreholes for ground source heat
- Deliveries of building materials including bricks, blocks, concrete, timber, fixtures and fittings.
- Construction and assembly of the dwellings

The occupation phase will generate sources of environmental impacts as follows:

- Personal transportation, i.e. motor cars; vehicle movements, parking
- Heating of the dwellings
- Water supply to the dwellings
- Laundry
- Visual
- Drainage
- Run-off

2. Alternatives that have been considered

No serious alternative strategies have been promoted by SLDC in their consultation. Some alternatives are discussed in Section 5 – Mitigation.

3. Description of the environment

The village of Brigsteer comprises 91 dwellings on the eastern slopes of the Lyth Valley, and 4 miles to the south-west of the town of Kendal.

The community is served with electricity to all households (single phase) and mains water. There is no gas supply or any main drainage – all properties are served either by a septic tank or small treatment unit. The electricity supply is subject to interruption (through high winds for example and several outages are experienced every year, extending from 1 hour to 14 hours in 2010. Water supply to the village is through a single main and was interrupted once for approximately 10 hours in 2010.

There is no school, neither is there a shop. Public transport is minimal: the one bus per week allows less than three hours in Kendal on Wednesday morning.

The village is built at the foot of Burnbarrow Scar and is surrounded by woodland to the east and overlooks the low-lying Moss to the west, draining via the Pool and Gilpin Rivers and pumped drainage to preserve the agricultural value of the land.

The woodland includes mature deciduous woodland, particularly on site RN 213 comprising oak, ash, yew and woodland understorey.

The economy of the area is dominated by agriculture with some 12 farms within the parish boundary, 2 bed and breakfast businesses and one agricultural machinery business. The public house has recently closed, with no apparent prospect of imminent re-opening.

Most roads providing access to the village are narrow, the only 2-way road leads directly from Kendal, but this is routed across the top of Scout Scar and with a 12% gradient into the village, is not easily accessible in ice and snow conditions.

With only 91 existing dwellings, the village is sensitive to the provision of an estate at the edge of the village dedicated to private/affordable housing mix, increasing the number of dwellings by up to 7.7 % in a single development.

4. Description of the significant effects on the environment

4.1. Travel and Transport

The proposal to build up to 7 additional homes brings with it the need for the occupants of the new dwellings to own their own car – depending on the circumstances, this may be 2 cars. (A group of 4 affordable homes already in the village boasts 7 cars). If the whole development were to attract owners and tenants with similar patterns of ownership, there will be at least 12 additional vehicles parked permanently in the village.

4.2. Traffic

Observations of traffic through the village show that there are a disproportionately large number of agricultural vehicle movements (comprising large tractors with trailers), particularly at muck-spreading and grass-cutting times, and cyclists (part of the tourist attractions of the Lyth Valley). There is no speed limit in the village.

This report attempts to model the likely impact of the marginal increase in transport-related emissions as a result of the project proposals described above:

The model is related to:

1. The existing group of affordable homes in Brigsteer
2. The Housing Trust report of Housing Need
3. The additional fuel demand arising from being domiciled in Brigsteer

In the first instance, there are 4 houses (Trinity Cottages) whose occupants operate 7 motor cars.

In the second case, the report ¹ identifies a derived gross daily commuting distance to and from work of 1435 miles². This equates to $1435/17 = 84.4$ miles per working day per dwelling. This excludes travel to Kendal or elsewhere for shopping, doctor, dentist or entertainment.

Thus for 7 dwellings, an expected additional car population of some 12 cars must be planned for in terms of parking and additional carbon dioxide and other GHG emissions.

On this basis and using a medium –sized car at 309 g CO²/mile³, the **additional** emissions due to motor transport equates to 0.183 tonnes CO² emitted per working day. [As a comparator, it is estimated that each person in the UK on average emits between 5 and 6 tonnes CO² per annum and this should be around 3 tonnes ⁴ if we are to manage the UK's emissions to meet its targets]. Commuting alone will account for 2.86 tonnes per person per annum, assuming 220 working days per year and 2 persons per dwelling.

¹ Cumbria Rural Housing Trust, 2008

² Of 25 people in the 17 households, 9 travel less than 5 miles to work, 4 travel 5-20 miles, 3 travel 20-50 miles and 9 travel more than 50 miles. Above value is calculated from median values and 60 miles in the case of >50. Data has been extracted from Affordable Housing needs report Cumbria Housing Trust 2009.

³ Based on 39 mpg for a medium sized petrol car (see www.transportdirect.info)

⁴ RSA *CarbonLimited* project – 'A Persuasive Climate' RSA 2009

4.3. Construction of New Build Houses

The proposals envisage the new build of some 7 dwellings (not the conversion or adaptation of existing buildings).

The environmental footprint for the construction (not the ongoing occupation) of new houses is strongly dependent on their design. The main component is 'embodied energy' being the energy needed to create bricks and cement.

Published figures⁵ indicate that an expected 500-1000 kg of CO² equivalent can be expected per sq m of a house: this equates to 525 tonnes of CO² equivalent for the whole development using the median value of 750 kg and a typical floor area of 100m².

4.4. Code for Sustainable Homes

Standards for affordable housing to meet the Code for Sustainable Homes⁶ incur additional costs – it is usually a condition of Government funding to at least Level 4 of the Code. To achieve this level, dwellings will require as a minimum:

- 44% improvement over Target Emission Rate (TER) for Energy/CO² as determined by the Building Regulation Standards
- Maximum internal potable water consumption measured in litres per person per day (l/p/d) 105 l/p/d
- The Environmental impact of at least three of the following materials as a key element of construction are specified to achieve a BRE Green Guide 2006 rating of at least D
 - Roof structure and finishes
 - External walls
 - Upper floor
 - Internal walls
 - Windows and doors
- Surface water management - ensure that peak run-off rates and annual volumes of run-off will be no greater than the previous conditions for the development site. 100% in areas of high risk of flooding.
- Household waste storage where there is adequate space for the containment of waste storage for each dwelling.

All these requirements will add to the capital cost of new build: Case Studies⁷ indicate that a Level 3 house will cost at least £965 per square metre. The special conditions described above about energy infrastructure and water run-off means that Brigsteer location will add considerably to this cost.

In addition, there will be an ongoing social cost for dependant individuals or families (visits by doctors, healthcare professionals, school travel etc.).

⁵ Embodied energy in Residential Property Development – A guide for Social Landlords; Housing Corporation 1999

⁶ Code for Sustainable Homes - Department for Communities and Local Government: London

⁷ Sustainable Homes Case Studies - Department for Communities and Local Government 2009

4.5. Biodiversity

Another global issue with local action needed is the need to preserve biodiversity – the site is managed woodland with a margin of mature oak trees.

The Cumbria Biodiversity Action Plan identifies key species for protection - these include bats, red squirrels, water voles, barn owls and the juniper tree. Of the nominated species, bats, barn owls and the juniper are present in Brigsteer. Site RN 213 also boasts the presence of bats and lesser spotted woodpeckers, the latter according to the RSPB are now in the danger zone and been referred to the Rare Breeding Birds Panel⁸. This may be related to the presence of mature oak trees: surrounding woodland to the north and west does not contain oak trees.

4.6. Energy Sources

The energy needed for heating lighting and operating other domestic appliances is a key issue addressed in the Code for Sustainable homes. Building in Brigsteer poses a problem due to the absence of mains gas – most homes in the village are heated with oil or LPG: as very apparent at the time of writing- the cost of heating by conventional means will require the occupants to spend much more than average on their heating bills than they would elsewhere.

Possible solutions are to install a small-scale district heating scheme using ground source heat pumps: however these are expensive, require 3-phase mains electricity and due to the ground conditions will require deep wells to extract ground heat, all of which is a significant capital spend. Alternative energy sources for heating may also be needed to cope with supply disruptions. Bio-fuelled boilers are another option, but require electricity for ignition and control.

4.7. Water

All properties will require a mains water supply: this is currently supplied from the north along a single pipeline. An increase of more than 7% in the number of dwellings is likely to create the possibility of the need for an increase the demand beyond the capacity of the pipeline to the village. In the past 3 years, bursts in the ageing pipeline have interrupted the supply at least six times.

4.8. Run-off and flooding

The proposed development will be located on the eastern edge of the Lyth Valley. This valley has a drainage system currently operated by the Environment Agency, based on electric pumping stations and a series of levees. In the next two years the Environment Agency will cease to operate the pumping stations; unless operation is assumed by a group of farmers, the risk of flooding in the valley will increase.

⁸ RSPB Birds Magazine Spring 2012

Any building will add to the storm water run-off, simply adding to the load on the pumps and making the situation for those attempting to preserve the land as an agriculturally productive area worse.

A typical house will have approximately 30 sq m of roof, and with an annual rainfall of 1,522 mm (average of the last 5 years in Brigsteer), if 7 houses were built the additional storm water load on the valley system would be: $7 \times 30 \times 1.522 \times 0.9 \text{ cu. m.} = 288 \text{ cu. m.}$ [0.9 is the factor intended to take account of evaporation and absorption]. The main problem will occur in periods of high rainfall. As itemised in the Code for Sustainable Homes, this means that 100% attenuation of run-off will need to be achieved; the practical approach being underground storage tanks of around 20,000 litres (i.e. 20 cubic metres) capacity. These tanks could, of course, be used to supply water for non-potable use in the properties. Nonetheless, this will involve considerable ground-work in solid carboniferous limestone rock.

4.9. Sewerage and groundwater pollution

With no sewerage in the village, all properties will need a septic tank or a small sewage treatment plant. The Environment Agency has expressed concern about the need for owners of septic tanks to ensure that they are properly maintained⁹ – mainly because of groundwater pollution, which is beginning to emerge as a significant environmental hazard.

Discharges from septic tanks and small sewage treatment plants are mainly exempt from the need to have an environmental permit, but they are of concern to the Environment Agency due to European legislation.

4.10. Noise and visual impact

Most noise will be associated with building activity – although as noted above there will be considerable effort associated with cutting large cavities in the rock substrate for sewage and water storage.

Noise apart from construction will arise from occupation, although it is unlikely to be a significant environmental impact.

Development of Site 213 could have a serious visual impact on the northern boundary of the village, currently well defined by the line of mature oak trees bordering the north side of the Underbarrow road. Any felling would materially alter the character of the village on this boundary.

⁹ EA web-site <http://www.environment-agency.gov.uk/homeandleisure/118753.aspx>

4.11. Land use

Given the national and international concerns about food security (see Annex A), there is some relevance in ensuring that all sites currently available for agriculture are not removed from production.

4.12. Overall marginal Increase in the Carbon footprint

The National Park has published its own Strategy¹⁰ for reducing its carbon footprint. This is a response to concerns about climate change, but also because it presents considerable opportunities for people and businesses in Cumbria.

5. Mitigation

The District Council proposals do not include alternatives: however, there is a considerable disconnect between the findings of the Cumbria Rural Housing Trust survey and that of the proposals, which advocate a single tranche of building in Phase 1 of the plan (i.e. by 2015). Local opinion¹¹ contends that this does not meet the need in time or space. The best approach will be to utilise existing properties and land spaces to create genuine infill at a speed which meets the needs identified in the housing needs survey.

Other factors suggest that a development of this scale is best met where the infrastructure is available (particularly mains gas) and distances to work are such that travel by motor car not a necessity. In this respect the comments made by the Homes and Communities Agency¹² that *"Newer areas, often big estates, are sometimes soulless places, disconnected and car dependent, wasteful of energy and built with little recognition of the wider environment where planning seems to have been an afterthought and public transport connections are poor"*.

¹⁰ Low-carbon Lake District: Responding to climate change in the National Park June 2009

¹¹ Annual Helsington & Brigsteer Parish meeting 2 March 2011 & parish Meeting 10 April 2012

¹² See <http://skills.homesandcommunities.co.uk/sustainable-communities>

6. Non-technical summary (EIS)

1. Brigsteer, although located near to Kendal in distance, has a very limited infrastructure, having no gas, no shop, no school and no bus service.
2. Affordable homes, by definition have to meet Government Guidelines for sustainable construction. In addition to the sensitivities of the physical environment, all these requirements add considerable financial capital cost to any construction project. If public money is to be used, it will be spent more beneficially (i.e. more homes) in areas with a developed infrastructure.
3. Affordable homes, by definition, are occupied by people on limited incomes: the limitations imposed by the limited (and ageing) infrastructure mean that the cost of living will be higher than other locations better served by utilities and services, and is likely to rise faster than income, particularly as a high percentage of living costs will be geared to oil prices.
4. Any greenfield development will necessarily attract a high cost in terms of carbon footprint, both in the construction and subsequent occupation phases. It will also adversely impact on wildlife, particularly the lesser spotted woodpecker and bats.

7. Lack of know-how/technical difficulties

This report has been prepared on the basis of the references listed and other available information in the public domain. The content has been reviewed by local residents for accuracy and to the best of the author's knowledge the report is entirely factual.

Annex A

Sustainability Issues in a Policy Context

Sustainable Development

Sustainable Development is a widely- used term originally defined by the United Nations at the World Commission on Environment and Development chaired by Gro Bruntland and reporting in 1987. It defined sustainable development as *'development which meets the needs of the present without compromising the ability of future generations to meet their own needs.'*

Subsequent studies and conferences addressing this issue coined the phrase *'think globally, act locally'*, recognising that, in the end, our own behaviours, particularly in our consumption of global resources, is the only practical way to make a difference.

Sustainable Communities

A concept established in the UK envisaging *'homes in well-connected, carbon-efficient communities with a range of facilities such as schools, health centres, shops, pubs and parks'* (HCA)

According to the Homes and Communities Agency, *'Such neighbourhoods – what we call sustainable communities – don't happen by chance. Some, in towns and cities, have taken years to develop. Others, more recent in origin, were born out of a strong partnership between planners, developers, local authorities and community groups.'*

Yet too many places are neither cohesive, connected, well-designed nor well-planned. Some, for various reasons, have lost the essential glue that binds them together. Newer areas, often big estates, are sometimes soulless places, disconnected and car dependent, wasteful of energy and built with little recognition of the wider environment where planning seems to have been an afterthought and public transport connections are poor.' (HCA web-site 2011)
<http://skills.homesandcommunities.co.uk/sustainable-communities>

Affordable Housing

A UK Government Policy for Housing in which it is committed to providing high quality housing for people who are unable to access or afford market housing, for example, vulnerable people and key workers as well as helping people make the step from social-rented housing to home ownership. (Policy Planning Statement 3)

Kyoto - Carbon Reduction Commitment

The UK is a signatory to the Kyoto Protocol and has enshrined this commitment within the Climate Change Act 2008: The [Climate Change Act 2008](#) set legally binding emission reduction targets for 2020 (reduction of 34 percent in greenhouse gas emissions) and for 2050 (reduction of at least 80 percent in

greenhouse gas emissions), and introduced five-yearly [carbon budgets](#) to help ensure those targets are met.

Recent commentators have identified additional carbon usage through imported goods, which have a 'embodied energy'; content – if the UK were measured on this basis, carbon emissions have increased by 30% over the period since Kyoto, not diminished as the Government claims.

Low-Carbon Lake District

The National Park produced a report in 2008 which identified that: *'The Lake District could stand to gain from some of these trends (Rising energy costs, renewable and nuclear power, low carbon transport, greener choices) – such as the move toward more decentralised energy generation, and greener products and services. A new study on the economic impacts of climate change legislation for Cumbria estimates that, with the right support and encouragement, the county as a whole could benefit from moves to cut carbon. While all businesses will have to adapt to higher prices for carbon, the overall impact is likely to be positive, with the potential for around 1500 new jobs in the sustainable energy and tourism sectors. The study points to a number of areas that should be supported, because of the potential for combined economic, social and environmental gain.'*

A full copy of the report is available at: <http://www.lakedistrict.gov.uk/lowcarbonlakedistrict>

Peak Oil

Most energy commentators and many industry studies have concluded that the rising demand for oil is outstripping the rate of supply and the rate at which new reserves are found and exploited.

Wikipedia has an interesting entry under Peak Oil "Optimistic estimations of peak production forecast the global decline will begin by 2020 or later, and assume major investments in alternatives will occur before a crisis, without requiring major changes in the lifestyle of heavily oil-consuming nations. These models show the price of oil at first escalating and then retreating as other types of fuel and energy sources are used. Pessimistic predictions of future oil production operate on the thesis that either the peak has already occurred, that oil production is on the cusp of the peak, or that it will occur shortly. The International Energy Agency (IEA) says production of conventional crude oil peaked in 2006.

Energy Supplies and Pricing

Due in part to the unrest in the Middle East, the price of oil is at an all-time high at the time of preparing this report: this affects the price of gas and practically all commodities in an oil-dependant economy. Commentators are agreed that a mix of supply-side issues with oil, issues with nuclear (with the Japanese nuclear emergency fresh in European minds) that energy of all kinds will continue to rise in cost.

Embodied Energy

All goods and materials we use carry with them a carbon footprint – building materials are no exception, particularly for bricks and cement: the Housing Corporation estimate that 500-1000 kg CO₂ equivalent is emitted per sq. metre of house. However, equally important is the lifetime emissions as a result of occupation, so that over the life of the property, emissions are minimised.

Bio-diversity

A major global issue, discussed at a recent United Nations conference in Rio de Janeiro in 2010. In the UK, local authorities were required to prepare a BioDiversity Action Plan – full details of the plan for Cumbria are reproduced at Annex B

Food Security

A recent UN report on food supplies has highlighted the inadequacy of the current regime for the supply, marketing and distribution of food to support the world's population. The UK Government has also expressed concern in a recent report – with the UK dependant in food imports to the tune of 60% of food consumed, there is real cause for concern.

"We need to act now," said [Caroline Spelman, the secretary of state for environment, food and rural affairs](#), whose department co-commissioned the report from the government's futures think-tank [Foresight](#). "Farmers have to grow more food at less cost to the environment. In the UK, farmers should produce "more food more sustainably" and she suggested that small price increases represented an economic opportunity for British farmers."

Flood management

Some 5.2 million homes in the UK are subject to flood risk: the government's legislative response has been to enact the *Flood and Water Management Act 2010*. The Act gives local authorities a new role to manage local flood risk in their area.

The Lyth Valley is particularly prone to flood risk, the more so in the next two years the Environment Agency will cease to operate the pumping stations; unless operation is assumed by a group of farmers, the risk of flooding in the valley will increase.

Water resources

"There are significant pressures on water resources which affect both the water environment and water supplies. There are many catchments where there is little or no water available for abstraction during dry periods.

Pressures are greatest in South East and Eastern England because of them being the driest parts of England and Wales, coupled with the highest population density and household water use. The demand for water to irrigate crops in East Anglia also adds to the pressure on resources during the driest times of the year.

Over the next 30 years, there will be increasing pressures from the rising population and associated development. Looking further ahead, the impact of climate change could have a major impact on the water that will be available for all uses."¹³

¹³ Environment Agency Report - Water resources in England and Wales - current state and future pressures. December 2008

Cumbria Biodiversity Action Plan

The Cumbria Biodiversity Action Plan (BAP) was published by the Cumbria Biodiversity Partnership in 2001. This local BAP is the means by which national biodiversity targets will be met locally. The document also includes locally important species and habitats that are characteristic to Cumbria but not covered by the national targets.

The Cumbria BAP also aims to raise public awareness and understanding of the natural environment and hopes to encourage local people and politicians to take a closer interest in biodiversity in order to take action to help vulnerable wildlife and threatened habitats.

Biodiversity & Economy

Diverse habitats and communities of plants and animals should be conserved for their own sakes but we often overlook their importance to the economy of our area. It is the range of landscapes and the species they support that bring in the huge numbers of tourists that visit Cumbria throughout the year. These visitors provide a vital source of income to shops, hotels, campsites, B&B's and cafes and their membership of some of the organisations working to protect the environment of the county is highly significant.

A biologically diverse natural environment also attracts businesses to set up in the county, bringing with them jobs and prosperity for our towns and villages. Many of the habitat management techniques used to help to conserve biodiversity can also benefit the economy such as the production of woodland products like timber and charcoal.

The Action Plan

21 species and 18 habitats have been identified for priority action and targets set for recovery. Species include bats, red squirrels, water voles, barn owls and the juniper. Habitats include nutrient enriched lakes, hay meadows, blanket bog, and upland oak and ash woods.

The Cumbria BAP also lists a number of actions including lobbying to reform the Common Agricultural Policy, influencing industry, utilities, landowners, farmers and the public sector to adopt sympathetic approaches to land management, ensuring that planning policy and practice act to protect biodiversity and securing widespread public interest and involvement in protecting biodiversity.

Further Information and Contacts

To find out more about Cumbria's Biodiversity Action Plan and biodiversity in Cumbria contact:

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RSPB ‘Birds’ Magazine Spring 2012