

**GREENHAM REACH
SMALLHOLDINGS**

**PROOF OF EVIDENCE
OF
DR LARCH MAXEY
LLB., M.Sc., Ph.D., FRGS.**

**IN RELATION TO APPEALS
APP/Y1138/A/12/2181807,
APP/Y1138/A/12/2181808, and
APP/Y1138/A/12/2181821**

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1. Qualifications and Experience

- 1.1 My name is Dr. Larch Maxey LLB., M.Sc., Ph.D., FRGS.
- 1.2 I graduated in Law from The University of Manchester in 1993, European Environmental Policy and Regulation (Lancaster University) in 1995 and with a Ph.D. in Geography from Swansea University in 2002, where I taught and carried out research into sustainability from 1995-2009. My Ph.D. focused on sustainable communities and sustainability remains the focus of my research.
- 1.3 I am a Research Fellow at the Centre for Sustainable Futures and a member of the Management Team of the Institute for Sustainable Solutions Research, both with Plymouth University. I am Project Manager with the Network of Wellbeing and co-founder of the Royal Geographical Society-IBG Participatory Geographies Research Group, co-founder and director of Bumble Bee Woodland Trust and founding director of Plymouth Growing Futures. I co-founded several organisations responsible for shaping national and local sustainable development planning policies and was a founding director and Director of Research at Lammas Low Impact Living Initiatives Ltd. I have recently completed research into Low/Zero Carbon Building and the UK's Code for Sustainable Homes (CSH).
- 1.4 **I declare a conflict of interest:** I am also a director and the Chair of the Committee of Management of the Ecological Land Co-operative Ltd (ELC). However, my evidence has been prepared as an expert witness and not as an advocate for the Appeal Scheme.

2. Scope and Structure of My Evidence

- 2.1 My evidence will address a number of matters as follows:
- 2.2 **Part 1** introduces Low Impact Development (LID) and provides a description of ecological and carbon footprinting indicators used to evaluate an individual's or project's impact on the global environment, addressing the Appeal Scheme's delivery of the policy objective of "living within environmental limits" (page 2, National Planning Policy Framework (NPPF)).
- 2.3 **Part 2** assesses the extent to which the Appeal Scheme would deliver reductions in resource use and greenhouse gas (GHG) emissions while remaining reversible and affordable. It also summarises how the Appeal Scheme will be adaptive to climate change (NPPF paragraphs 93-4).
- 2.4 **Part 3** summarises the contribution the project is likely to make to sustainable development research and learning.
- 2.5 **Part 4** considers how the Appeal Scheme relates to UK Government policy on wellbeing.

3. Evidence

Part 1

- 3.1 Although already well-established within the planning system, sustainability continues to gain significance as evidence of rapid climate change mounts and policy responds to this challenge. For example, the Climate Change Act 2008 commits the UK to CO² emissions reductions of 34% by 2020 and 80% by 2050, whilst the NPPF is explicit in placing sustainability at the heart of the planning system:

“At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking.” (paragraph 14)

- 3.2 A call for reductions in resource use and GHG emissions (“living within our environmental limits”) is one of five pillars of sustainable development described in the NPPF and is found within each of Mid Devon’s Development Plans including its emerging plan.

Low Impact Development

- 3.3 Low Impact Development (LID) may be defined as development which “through its low negative environmental impact either enhances or does not significantly diminish environmental quality” (Appendix CA/11).
- 3.4 The concept and practices of LID have been developed in the UK since the 1990s through a dialogue between planners and developers, so that LID tends to be locally adapted, diverse and unique, make use of natural, local and reclaimed materials, be of an appropriate scale and visually unobtrusive, powered by renewable energy and independent in terms of energy, water and sewage whilst enhancing biodiversity and public access to open space. LID generates traffic movements far below the national average through integrating sustainable livelihoods, lift-sharing and greater use of public transport, walking and cycling¹. LIDs usually have a traffic management plan.
- 3.5 A key feature of LID is its integration of land based employment with other basic household needs and functions, as the Welsh Assembly Government (WAG) notes, such “...Development therefore is not just describing a physical development. It is

¹ Figures for traffic generated at existing LIDs was submitted as part of the application documentation (Additional Information: Traffic & Safety)

describing a way of living differently where there is a symbiotic relationship between people and land, making a reduction in environmental impacts possible”². LID thus integrates human and natural systems to create livelihoods which operate in and enhance local economies whilst delivering highly affordable, low/zero carbon housing. LID dwellings can cost from a few hundred to a few thousand pounds to construct (Appendix CA/11).

- 3.6 LIDs have been at the cutting edge of sustainable solutions in several spheres, including low/zero carbon housing design, rainwater harvesting, renewable energy generation, waste minimization and land management, including zero/low till production, permaculture and agroforestry. The latter indicates the potential for LID to contribute to the UK Governments ‘sustainable intensification’ agenda within food production, as outlined in Dr. Wright’s proof of evidence.
- 3.7 Independent research over the last fifteen years has found that LID represents some of the most sustainable development and innovation in the UK, and has been unusually successful at delivering on all three components of sustainability (economic, social and environmental) outlined in the NPPF³. This success has led to a growing number of LID planning policies such as Dartmoor National Park Authority (DMD30 – emerging plan) and the Welsh Assembly Government’s (WAG) national LID planning policy⁴.
- 3.8 Research into LID is set to increase as Research Councils and other funding bodies recognise its potential to help address the gap between scientific knowledge of challenges such as climate change, policy and practice. This research agenda will address many aspects of LID, including construction methods, land management and socio-economic impacts. Whilst addressing LIDs’ environmental performance, rather than the social or economic, ecological footprinting and carbon footprinting are established tools to measure these aspects of LIDs’ performance, as is illustrated by their inclusion in the WAG’s LID policy (application documentation “Response to Holcombe Rogus Parish Council – Appendix C” points 4.18-4.19).

² Welsh Assembly Government (2012) *Practice Guidance: Technical Advice Note 6 – Planning for Sustainable Rural Communities October 2012*, p.2

³ See, for example, UWE (University of the West of England)/ Land Use Consultants (2002). *Low Impact Development – Planning Policy and Practice. Final Report*. Bristol and Baker Associates (2004) *Low Impact Development— Further Research*, Feb 2004 and Welsh Assembly Government (2012) *Practice Guidance: Technical Advice Note 6 – Planning for Sustainable Rural Communities October 2012*

⁴ Welsh Assembly Government (2010) *Technical Advice Note 6 – Planning for Sustainable Rural Communities* para 4.15 “One Planet Development”.(submitted with application documentation) and Welsh Assembly Government (2011) *Planning Policy Wales 4th Edition February 2011* paragraphs 9.3.11-12.

Ecological Footprinting

- 3.9 Ecological Footprinting (EFP) is a widely adopted tool used to assess the sustainability of human lifestyles at every scale, including nationally, regionally and at the individual/household level. EFP analyses key activities such as transport, energy and water use, product consumption and waste production and is expressed as global hectares (gha) per person. This allows comparison of different activities and different groups. For example, the average EFP in the South West is 5.56 gha per person⁵, whilst the global resources available are currently estimated to be 1.88 gha/person. 1.88 gha/person or below is therefore the best current estimate for a sustainable level of consumption. Anything above this level is likely to be unsustainably depleting the world's resources. The average person in the South West is thus consuming three times the amount that can be sustained.
- 3.10 In order for the South West to live “within the planet’s environmental limits” as outlined in the NPPF, residents would need to reduce their ecological footprint by 66%. By undertaking EFP analysis of the Appeal Scheme, residents’ EFPs can be compared with national and local averages. Furthermore, this can be carried out by an independent party in compliance with internationally recognised EFP standards⁶.

Carbon Footprinting

- 3.11 Carbon Footprinting (CFP) is a comparable measure to EFP, having developed from EFP analysis. CFP measures carbon emissions (CO²) and the CO² equivalent impact of other GHGs (CO²e) as carbon dioxide is the main GHG responsible for climate change⁷. CFP thus allows activities to be assessed according to their performance against climate change targets such as those outlines in the Climate Change Act 2008 as well as the NPPF (para 17 and section 10) Policy ST1 of the Structure Plan, Policies COR5 and COR9 of the Core Strategy, Policy AL/IN/6 of the Allocations and Infrastructure DPD, Policy DM5 of the draft Emerging Plan and the Council’s Green Infrastructure Strategy. The average CFP for Mid Devon is 11.2 tonnes per person⁸.

⁵ Jenkin and Stentiford (Eds.), (2005) *Analysis and Sustainability Assessment: A resource flow and ecological footprint analysis of the South West of England*, Best Foot Forward Ltd

⁶ Global Footprint Network (2009) *Ecological Footprint Standards 2009* Oakland: Global Footprint Network. Available at www.footprintstandards.org

http://www.footprintnetwork.org/images/uploads/Ecological_Footprint_Standards_2009.pdf

⁷ Wright, L.; Kemp, S., Williams, I. (2011). "Carbon footprinting": towards a universally accepted definition". *Carbon Management* 2: 61–72

⁸ Mid Devon Core Strategy 2026 (2007)

Part 2

The Appeal Scheme's sustainability performance

- 3.12 Research into existing LIDs suggests that the Appeal Scheme would support local and national sustainable development policies, with social, economic and environmental benefits. Socio-economic benefits are likely to include creating opportunities of new entrants into farming, increasing local skills, employment and spending and contributing to local cultural and social institutions such as local schools⁹.
- 3.13 In terms of its environmental performance, data from existing LIDs suggests that the Appeal Scheme will deliver significant improvements on national and regional EFPs and CFPs, as Table 1 illustrates.

Table 1 Comparing EFP and CFP performance¹⁰

	Average EFP (gha/person)	Average CFP (Tonnes/person)
UK average	5.45	12.1
Lammas	2.39	n/a
Landmatters	2.47	3.6
Mark Simon, Trevalon Organic Vegetables	2.53	4.6
Bill Knight, Keval Farm	2.72	n/a

- 3.14 As noted above (paragraphs 4.8-4.11) EFP and CFP are internationally recognised as robust measurement tools allowing comparison across a range of scales and contexts¹¹. Table 1, for example, compares the performance of two multi-household LIDs and those of two individuals with the UK average. This corroborates other research which did not employ EFP/CFP analysis, but also found significant improvement in LID residents' impacts¹². However, EFP data has a sensitivity of +/-

⁹ See for example: UWE (University of the West of England)/ Land Use Consultants (2002). *Low Impact Development – Planning Policy and Practice. Final Report*. Bristol. Baker Associates (2004) *Low Impact Development— Further Research*, Feb 2004. Pickerill, J. and Maxey, L. (2012) 'Low Impact Development: Radical Housing Solutions from the Grassroots.' In Davies, A. R (ed.) *Enterprising Communities: grassroots sustainability innovations*, Advances in Ecopolitics Book Series. Emerald, London, 64-83

¹⁰ Data for this table has been taken from a series of reports, see Appendices LM/02-04, CA/03 and application document "Additional Information: Traffic & Safety", Appendix A.

¹¹ EFP is an official indicator used by many organisations including WWF International, Welsh Assembly Government and Bristol City Council and recommended within the European Common Indicators Programme, European Parliament and the Audit Commission indicators project (e.g. see Appendix LM/04).

¹²UWE (University of the West of England)/ Land Use Consultants (2002). *Low Impact Development – Planning Policy and Practice. Final Report*. Bristol. Baker Associates (2004) *Low Impact Development— Further*

15% and should be used to highlight broad trends and the direction of travel, rather than too heavy a reliance upon particular figures. Thus Lammas, the only LID for which there is annual data publically available, has demonstrated improvement in the first two years of its annual monitoring of EFP, with 2.55 gha/person in 2010 and 2.39 gha/person in 2011 (Appendices CA/20 and CA/21).

3.15 The Appeal Scheme has a series of features which suggests its performance will at least match those of comparable LIDs including:

- food increasingly sourced on site and produced without fossil fuel-based inputs for farm machinery and fertilizers (food typically accounts for 30-50% of UK EFP/person (Appendix LM/01));
- 100% renewable energy sources replacing residents' current use of mains electricity largely derived from fossil fuels (70% gas and coal in 2011¹³);
- live-work and car-sharing arrangements will limit car use¹⁴;
- rainwater harvesting, grey water recycling and compost toilets;
- waste minimization, recycling and composting.

3.16 In addition, peer-reviewed research¹⁵ and EFP analysis (Appendices LM/02-04) demonstrates that those practicing permaculture have a greatly reduced ecological footprint due to their purchasing and lifestyle choices.

3.17 In addition to reducing EFP and CFP and thus addressing climate change mitigation policies, the Appeal Scheme will also meet the need for adaptation. LIDs' "low slow" development trajectory¹⁶ allows it to respond to changing climate, modifying species selection, infrastructure and livelihood design, for example. This and the high levels of autonomy for energy, water and other key resources enhance resilience.

3.18 The integrated nature of LID and this Appeal Scheme render the temporary dwellings essential. There are established precedents for the granting of five year temporary

Research, Feb 2004. Pickerill, J. and Maxey, L. (2012) 'Low Impact Development: Radical Housing Solutions from the Grassroots.' In Davies, A. R (ed.) *Enterprising Communities: grassroots sustainability innovations*, Advances in Ecopolitics Book Series. Emerald, London, 64-83

¹³ Digest of UK Energy Statistics (2012), Department for Energy & Climate Change

¹⁴ As set out in the Management Plan for the site

¹⁵ Pilkington B, Roach R, Perkins J (2011) Relative benefits of technology and occupant behaviour in moving towards a more energy efficient, sustainable housing paradigm, *Energy Policy*, v.39, nr.9, pp.4962-4970

¹⁶ Maxey et al, (2011)

permissions for LIDs to prove themselves¹⁷. The nature of LID and this Appeal Scheme mean that it is readily reversible, due to the low impact technologies and approaches proposed.

Part 3: Research and Learning for Sustainability

- 3.19 LID represents an important area of future research as UK Research Councils and other funding bodies' direct research towards key challenges such as climate change, energy security and economic stability. Furthermore, the direction of travel for such research is for greater levels of collaboration with practitioner organisations and the need to demonstrate research impact. This Appeal Scheme is ideally placed to support all these aims. Despite some notable exceptions, to date much of the innovation from LIDs has gone unreported as LID practitioners lacked time and resources to measure analyse and report on their activities. This Appeal Scheme addresses this challenge as the ELC provides the additional scope and capacity to liaise with the academic and non-governmental organisations eager to collaborate on research. This is illustrated by the success of the ELC's initial collaborations which have led to one significant research publication and the launch of a follow research project.
- 3.20 Education and learning for sustainability is also an important growth area which this Appeal Scheme is well placed to contribute to¹⁸, with learning opportunities spanning the formal-informal and full age spectrum from proposed field trips from Stawley Primary School, to visits from Universities, volunteer placements and apprenticeships to links with local U3A groups.
- 3.21 The ELC has already received expressions of interest from academic researchers and research institutes, see for example, letter of support submitted to PINS from Dr. Thomas Hemfrey of Durham University.

¹⁷ Lammas was granted a 5 year permission on this basis, for example, and the WAG TAN 6 (2010) One Planet Development policy allows for a 5 year period. This common need for five rather than three years is corroborated by research e.g. Maxey et al, 2011.

¹⁸ Sterling, S., Maxey, L. and Luna, H. (eds.) (2013) *The Sustainable University: Process and prospects*. Abingdon: Routledge

Part 4

Well-Being Implications

3.22 There is a strong direction of travel towards embedding wellbeing within UK policy, (NPPF p.i, paras 17 and 200 and Appendix LM/01). Wellbeing has many commonalities with sustainable development policy, with both able to improve quality of life through holistic approaches. Unlike sustainability, which is well established, planning policy is still adjusting to wellbeing's emerging policy imperative. This Appeal Scheme is ideally placed to deliver on the wellbeing agenda, creating rewarding employment based around fresh, healthy produce, fostering high levels of sociability and exercise, for example. In contrast, wellbeing policy highlights that requiring those engaged in long hours of often strenuous activity to travel to the site would be detrimental to their wellbeing as well as undermining the businesses environmental performance (see EFP and CFP section above) and viability (see Ms. Laughton's Proof of Evidence).

4. DECLARATION

- 4.1 I confirm that, insofar as the facts stated in my proof of evidence are within my own knowledge, I have made clear which they are and that I believe them to be true, and that the opinions I have expressed represent my true and complete professional opinion.
- 4.2 I confirm that my proof of evidence includes all facts which I regard as being relevant to the opinions which I have expressed and that attention has been drawn to any matter which would affect the validity of those opinions.
- 4.3 I confirm that my duty to the Inspector and the Secretary of State as an expert witness overrides any duty to the Ecological Land Co-operative, that I have understood this duty and complied with it in giving my evidence impartially and objectively, and that I will continue to comply with that duty as required.
- 4.4 I confirm that I am neither instructed, nor paid, under any conditional fee arrangement.
- 4.5 I confirm that I have no conflicts of interest other than that already disclosed in this proof of evidence.

5. Appendices to this Proof of Evidence

Appendices to this proof of evidence

This is a separately bound document labeled APP/Larch Maxey

LM/01 Briefing on UK Well-Being Policy

LM/02 Fourth World Design (2007) Report The Ecological Footprint of Landmatters Coop

LM/03 Fourth World Design (2008) Ecological Footprint Report Prepared for Mark Simon

LM/04 Extract From Stepping Forward A resource flow and ecological footprint analysis of the South West of England

Common Appendices cited in this proof

This is a separately bound document labeled APP/Common Appendices

CA/03 Lammas Low Impact Living Initiative (2012), Annual Monitoring Report for Tir y Gafel Ecovillage January – December 2011

CA/08 Policy DMD30 of Dartmoor National Park Authority emerging local plan

CA/09 H11 of Milton Keynes Council Local Plan

CA/11 Pickerill and Maxey (Eds.) (2009) Low Impact Development, the future in our hands, Creative Commons