From: <REDACTED@stroud.gov.uk>
Date: Fri, 19 Mar 2021 at 09:22
Subject: RE: Local Plan - PS37 Wisloe Important Evidence
To: <wisloeaction@gmail.com>

Dear REDACTED,

Thank you for your email.

The promoters have confirmed that further work has been carried out on site and that a report will be with me shortly. Once I have received the report I will share it with you and refer all of the material to Natural England for their advice.

Regards

REDACTED

Head of Planning Strategy

Stroud District Council

Ebley Mill, Ebley Wharf
Stroud, Gloucestershire. GL5 4UB

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---

From: <wisloeaction@gmail.com>
Sent: 09 April 2021 16:40
To: REDACTED@stroud.gov.uk
Subject: Re: Local Plan - PS37 Wisloe Important Evidence

Dear REDACTED

Thanks for your previous message. Please could you provide an update on progress made during the past few weeks?

Many thanks

Regards

REDACTED

From: REDACTED@stroud.gv.uk
Date: Tue, 13 Apr 2021 at 14:08
Subject: RE: Local Plan - PS37 Wisloe Important Evidence
To: <wisloeaction@gmail.com>

Dear REDACTED,

Thanks for your email.

Having waited for the Wisloe promoters to send me through their further report, in the absence of this report I took the view that it was best to send all of the information to Natural England as time is pressing. I enclose the correspondence with Natural England since our last email exchange which hopefully is self-explanatory. I do not know when the Wisloe promoters will be providing the Council with the further report.

Regards

REDACTED

Head of Planning Strategy

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---

From: <wisloeaction@gmail.com>
Sent: 03 May 2021 13:07
To: REDACTED@stroud.gov.uk

Subject: Re: Local Plan - PS37 Wisloe Important Evidence

Dear REDACTED

Please could you provide the Promoters responses to your requests and their promised report.

Many thanks

Regards

REDACTED

From: REDACTED@stroud.gov.uk
Date: Mon, 10 May 2021 at 13:33
Subject: RE: Local Plan - PS37 Wisloe Important Evidence
To: <wisloeaction@gmail.com>

Dear REDACTED,

Thank you for your email.

I enclose the correspondence I have had on this matter with the Wisloe promoters. I had another telephone call with them on Friday and I understand that they have been out to survey once but need to go back to complete the survey work shortly. When I receive the report it will be published on our website and I am happy to confirm our receipt of it by emailing you again.

Regards

REDACTED

Head of Planning Strategy

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2.STROUD DISTRICT COUNCIL CORRESPONDENCE WITH NATURAL ENGLAND

From: REDACTED@stroud.gov.uk >
Sent: 31 March 2021 16:07
To: REDACTED@naturalengland.org.uk

Cc: REDACTED@stroud.gov.uk
Subject: Stroud Local Plan and higher value soils

Dear REDACTED,

I am writing to you regarding the Stroud District Local Plan and the issue of higher value soils in particular.

As you will be aware the national minimum housing requirements for Stroud District are requiring the District Council to find land for significantly more housing development than is currently set out in the current adopted Local Plan (2015). Minimum housing requirements are increasing from 456 homes per annum to 630 homes per annum.

Whilst the Local Plan will promote the use of appropriately located brownfield land, housing and associated employment land requirements will inevitably require the Local Plan to allocate more greenfield land.

Whilst the Council has taken into account the quality of agricultural land along with other environmental and amenity factors when considering the location of allocations, there are a number of potential locations for development which perform relatively well against sustainability objectives, but where higher value soils are or may be present.

I would welcome an opportunity to discuss this matter further with you as we finalise our Local Plan.

On a specific matter, the potential new settlement site at Wisloe is identified on MAFF (1983) mapping as containing Grades 2 and 3 agricultural land. The promoters of the land commissioned a site assessment in 2019 and the report has identified the land as 3b. You can view the report here. Subsequently the report has been criticised through a technical review undertaken for a third party and I enclose the submission. Consequently, the land promoter has stated that they are undertaking further assessment work and I have been informed that a report will be provided to the Council when complete.

I would appreciate your advice on this matter at this stage and how Natural England may wish to be involved when the further assessment work has been carried out by the land promoters.

Regards

REDACTED

Head of Planning Strategy

Stroud District Council

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From: REDACTED@naturalengland.org.uk
Sent: 12 April 2021 15:37
To: REDACTED@stroud.gov.uk
Cc: REDACTED@stroud.gov.uk

Subject: RE: Stroud Local Plan and higher value soils

Dear REDACTED

Wisloe local plan allocation – ALC survey and best and most versatile land (BMV)

Our reference: 348558

Thank you for your email dated 31.3.21 and our videocall conversation on 8.4.21.

I have now discussed your query with our soils specialist and can offer the following feedback:

1. Updated soils survey of the Wisloe proposed allocation
   We understand a revised survey report will soon be forthcoming. Please can this be sent through to our consultations@naturalengland.org.uk email address and copying me in. I will liaise with our soils specialist to review the report.

2. Good practice in terms of local plan policy and practice with regard to soils and best and most versatile land
   When assessing potential allocations we encourage the Council to use the following approach:

    1. Subject to other material planning considerations those allocation sites supporting soils of lesser ALC grading should be selected first – i.e. 'worst (ALC) first'.

    2. Acknowledging that selection will rarely rely solely on ALC/BMV considerations the following criteria should be applied to deliver optimal soils conservation outcomes (including BMV):

        a. The design of allocations should aim to locate built development on lower ALC grade land and to safeguard soils i.e. through higher grades serving a green infrastructure role (e.g. formal and informal open space). The aim should always be to allow soils to maintain as much of their functionality as practically possible. For example, through good design and a soil management plan (NB application of the Defra 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites') worthwhile financial savings

can be made whereby suitable soils are used for residential gardens, playing fields, allotments, community orchards and parks, thus avoiding future problems due to e.g. waterlogging.

b. The export of BMV soils from allocation sites should always be regarded as the least preferred approach i.e. the last resort to enable their conservation by using them elsewhere. Any export should minimise the distance that soils cover in order to strictly limit the carbon implications of their transport. The aim should be to make the optimum positive use of these soils as close as possible to their site of origin.

I am currently awaiting further feedback regarding specific examples of good practice from other Councils and will forward this information to you when it arrives. In the mean time I hope the advice in this email will be helpful for your imminent internal meetings.

Kind regards

REDACTED

Lead Adviser

Planning for a Better Environment – West Midlands Area Team

[redacted]

http://www.naturalengland.org.uk/

3.SDC CORRESPONDENCE WITH PS37 PROMOTERS

From:
Sent: 30 March 2021 09:52
To: REDACTED@stroud.gov.uk
Subject: RE: Local Plan - PS37 Wisloe Important Evidence

REDACTED

If you could give a call relating the ALC, please?

Thank you.

Associate

Taunton

Better Together, Even If We're Apart. Read more about Stantec's COVID-19 response, including remote working and business continuity measures

---

From: REDACTED@stroud.gov.uk
Sent: 29 March 2021 17:26
To:
Subject: RE: Local Plan - PS37 Wisloe Important Evidence

Can you please provide me with a further update on when Soil Environmental Services will be able to respond to the ALC queries?

Regards

REDACTED

Head of Planning Strategy

Stroud District Council

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From:
Sent: 18 March 2021 09:56
To: RREDACTED@stroud.gov.uk
Subject: RE: Local Plan - PS37 Wisloe Important Evidence

REDACTED

Sorry for the delay in responding. The report will be with you shortly.

Associate

Taunton

Better Together, Even If We're Apart. Read more about Stantec's COVID-19 response, including remote working and business continuity measures

---

REDACTED@stroud.gov.uk

Sent: 15 March 2021 17:24
To:

Subject: RE: Local Plan - PS37 Wisloe Important Evidence

Thanks for your email.,

Can you please provide me with an update on when Soil Environmental Services will be able to respond to the ALC queries?

Regards

REDACTED

Head of Planning Strategy

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From:
Sent: 04 March 2021 11:56
To: REDACTED@stroud.gov.uk

Subject: RE: Local Plan - PS37 Wisloe Important Evidence

REDACTED

To advise, the consultant from Soil Environmental Services will be on site tomorrow morning to take further samples and then respond to the ALC queries. We have informed the Parish Council of the site visit.

From: REDACTED@stroud.gov.uk

Sent: 22 February 2021 09:13
To:
Subject: FW: Local Plan - PS37 Wisloe Important Evidence

Please find attached a report critical of the soil assessment work carried out for your clients on land at Wisloe.

Can you please review the report and provide a response, as appropriate.

Regards

REDACTED

Head of Planning Strategy

Stroud District Council

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Appendix 12

Wisloe Green Action Group
Mixed-Use Development in Wisloe Green

Air Quality Review

Wisloe Green Action Group
Mixed-Use Development in Wisloe Green

Air Quality Review

Revision	Date	Notes
1.0	18/06/2021	E3012

[redacted]

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-

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2	Air Quality Legislation, Policy and Guidance	2
3	Existing Conditions at Proposed Allocated Site	8
4	Allocated Development	12
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APPENDIX A - Air Quality Standards		15

1 INTRODUCTION

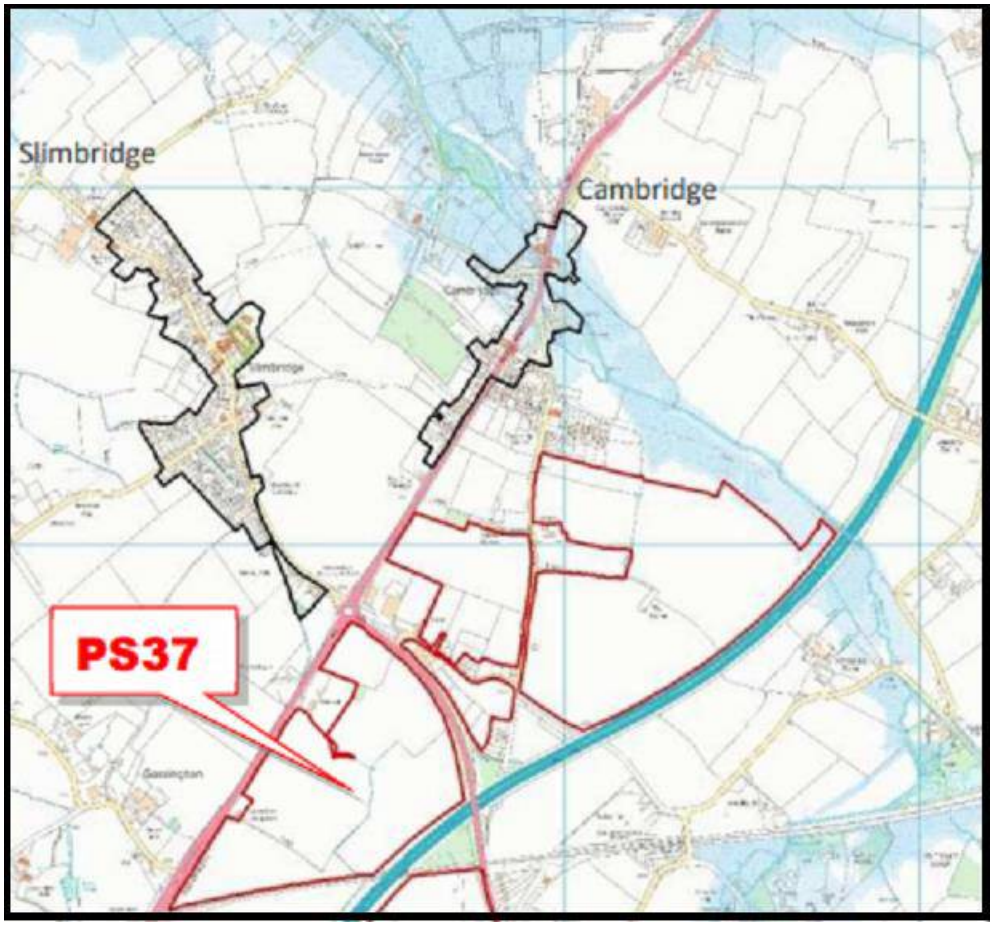
1.1 Entran Ltd has been commissioned by Wisloe Action Group to review the potential allocated site at Wisloe with regards to air quality. This report presents the findings of this review.

1.2 Within the draft local plan, an allocation is made for a new settlement at Wisloe. Identified as PS37 within the draft local plan. The site is allocated for a new garden community comprising:

- 5ha employment;
- up to 1,500 dwellings;
- a local centre including shops and community uses;
- primary schools(s); and
- associated community and open spaces uses and strategic green infrastructure and landscaping.

1.3 A plan showing the location of the proposed allocated land is illustrated in Figure 1.1 below.

Figure 1.1: Site Location



2 AIR QUALITY LEGISLATION, POLICY AND GUIDANCE

The European Directive on Ambient Air and Cleaner Air for Europe

2.1 European Directive 2008/50/EC of the European Parliament and of the Council of 21st May 2008, sets legally-binding Europe-wide limit values for the protection of public health and sensitive habitats. The Directive streamlines the European Union's air quality legislation by replacing four of the five existing Air Quality Directives within a single, integrated instrument.

2.2 The pollutants included are sulphur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter of less than 10 micrometres (μm) in aerodynamic diameter (PM_{10}), particulate matter of less than 2.5 μm in aerodynamic diameter ($PM_{2.5}$), lead (Pb), carbon monoxide (CO), benzene (C_6H_6), ozone (O_3), polycyclic aromatic hydrocarbons (PAHs), cadmium (Cd), arsenic (As), nickel (Ni) and mercury (Hg).

Air Quality Strategy for England, Scotland, Wales & Northern Ireland

2.3 The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland (AQS) published in July 2007[1], pursuant to the requirements of Part IV of the Environment Act 1995. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. The AQS is designed to be an evolving process that is monitored and regularly reviewed.

2.4 The AQS sets standards and objectives for ten main air pollutants to protect health, vegetation and ecosystems.

2.5 The air quality standards are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on medical and scientific evidence reviewed by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO). These are general concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects.

[1] Department for Environment, Food and Rural Affairs (2007), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

2.6 The air quality objectives (AQO) are medium-term policy-based targets set by the Government which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedences of the standard over a given period.

2.7 For some pollutants there is both a long-term (annual mean) standard and a short-term standard. In the case of NO_2, the short-term standard is for a 1-hour averaging period, whereas for PM_{10} it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants (e.g. temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road).

2.8 The AQS contains a framework for considering the effects of a finer group of particles known as '$PM_{2.5}$' as there is increasing evidence that this size of particles can be more closely associated with observed adverse health effects than PM_{10}. Local Authorities are required to work towards reducing emissions/concentrations of particulate matter within their administrative area. However, there is no statutory objective for $PM_{2.5}$ at this time.

Air Quality (England) Regulations

2.9 Many of the objectives in the AQS were made statutory in England with the *Air Quality (England) Regulations 2000*[2] and the *Air Quality (England) (Amendment) Regulations 2002* (the Regulations)[3] for the purpose of Local Air Quality Management (LAQM).

2.10 The Air Quality Standards Regulations 2010[4] have adopted into UK law the limit values required by EU Directive 2008/50/EC and came into force on the 10th June 2010. These regulations prescribe the 'relevant period' (referred to in Part I2V of the Environment Act 1995) that local authorities must consider in their review of the future quality of air within their area. The regulations also set out the air quality objectives to be achieved by the end of the 'relevant period'.

2.11 Ozone is not included in the Regulations as, due to its trans-boundary nature, mitigation measures must be implemented at a national level rather than at a local authority level.

[2] The Air Quality (England) Regulations 2000 - Statutory Instrument 2000 No.928

[3] The Air Quality (England) (Amendment) Regulations 2002 - Statutory Instrument 2002 No.3043

[4] The Air Quality Standards Regulations 2010 – Statutory Instrument 2010 No. 1001

2.12 The air quality standards and objectives for the pollutants discussed in the assessment are presented in **Appendix A.**

Local Air Quality Management (LAQM)

2.13 Part IV of the Environment Act 1995 also requires local authorities to periodically Review and Assess the quality of air within their administrative area. The Reviews have to consider the present and future air quality and whether any air quality objectives prescribed in Regulations are being achieved or are likely to be achieved in the future.

2.14 Where any of the prescribed air quality objectives are not likely to be achieved, the authority concerned must designate that part an Air Quality Management Area (AQMA).

2.15 For each AQMA, the local authority has a duty to draw up an Air Quality Action Plan (AQAP) setting out the measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the air quality objectives. Local authorities are not statutorily obliged to meet the objectives, but they must show that they are working towards them.

2.16 The Department of Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities in their Review and Assessment work. This guidance, referred to in this report as LAQM.TG(16)[5] and the advice used as appropriate.

National Planning Policy Framework

2.17 The National Planning Policy Framework (NPPF)[6] sets out the Government's planning policies for England and how these are expected to be applied. At the heart of the NPPF is a presumption in favour of sustainable development. It requires Local Plans to be consistent with the principles and policies set out in the NPPF with the objective of contributing to the achievement of sustainable development.

2.18 The NPPF states that the planning system has three overarching objectives in achieving sustainable development including a requirement to '*contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy*.'

2.19 Under Section 15: Conserving and Enhancing the Natural Environment, the NPPF (paragraph 170) requires that *'planning policies and decisions should contribute to and enhance the natural local environment by …preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible help to improve local environmental conditions such as air and water quality'*

2.20 In dealing specifically with air quality the NPPF (paragraph 181) states that *'planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan'.*

2.21 Paragraph 183 states that *'the focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively.'*

Stroud District Council Local Plan

2.22 SDC Local Plan was adopted in November 2015 and contains the following policies with regards to air quality. SDC are currently producing a new Local Plan and have submitted a draft for consulation, these policies are retained in the draft local plan:

2.23 Core Policy CP14 states:

'High quality development, which protects, conserves and enhances the built and natural environment, will be supported. Development will be supported where it achieves the following:

[5] Department for Environment, Food and Rural Affairs (DEFRA), (2016): Part IV The Environment Act 1995 Local Air Quality Management Review and Assessment Technical Guidance LAQM.TG16, April 2016

[6] Ministry of Housing, Communities and Local Government: National Planning Policy Framework (February 2019)

- *No unacceptable levels of air, noise, water, light or soil pollution or exposure to unacceptable risk from existing or potential sources of pollution.'*

2.24 Delivery Policy ES3 states:

'Development proposals (as appropriate to their nature and scale) will demonstrate that environmental risks have been evaluated and that appropriate measures have been taken to minimise the risks of adverse impact to air, land and water quality.

Permission will not be granted to any development which would be likely to lead to, or result in an unacceptable level of:

- *Environmental pollution to water, land or air.'*

2.25 Delivery Policy ES5: Air Quality states:

Development proposals which by virtue of their scale, nature or location are likely to exacerbate existing areas of poorer or marginal air quality, will need to demonstrate (potentially by provision or a formal air quality assessment) that effective measures can be taken to mitigate emission levels in order to protect public health and well-being, environmental quality and amenity. Mitigation measures should demonstrate how they will make a positive contribution to the aims of any locally agreed air quality and/or transport strategies for Stroud District and may include:

- *Landscaping, bunding or separation to increase distance from highways and junctions;*
- *Possible traffic management or highway improvements to be agreed with the local authority;*
- *Abatement technology and incorporating site layout / separation and other conditions in site planning;*
- *Traffic routing, site management, site layout and phasing;*
- *Managing and expanding capacity in the natural environment to mitigate poor air quality.*

EPUK & IAQM Land Use Planning and Development Control

2.26 Environmental Protection UK (EPUK) & Institute of Air Quality Management (IAQM) published the Land Use Planning and Development Control Air Quality guidance in May 2015[7] to provide guidance on the assessment of air quality in relation to planning proposals and ensure

[7] EPUK & IAQM. Land-Use Planning and Development Control: Planning for Air Quality, May 2015

that air quality is adequately considered within the planning control process. This guidance was updated in January 2017[8].

2.27 The main focus of the guidance is to ensure all developments apply good practice principles to ensure emissions and exposure are kept to a minimum. It also sets out criteria for identifying when a more detailed assessment of operational impacts is required, guidance on undertaking detailed assessments and criteria for assigning the significance of any identified impacts.

[8] EPUK & IAQM. Land-Use Planning & Development Control: Planning for Air Quality, January 2017

3 EXISTING CONDITIONS AT PROPOSED ALLOCATED SITE

Description of Site

3.1 The proposed allocated site (PS37) comprises 84 hectares of land which is currently primarily agricultural land. It is located close to the settlements of Slimbridge and Cambridge.

3.2 It is the bordered to the northeast by the River Cam, to the southeast by the M5 motorway, to the south by the Cam & Dursley railway line and to the northwest by the A38. The A4135 runs through the site.

3.3 The area of the site is relatively flat with a gentles slope towards the River Cam at the northeast. The M5 motorway is at grade along most of the route adjacent to the site and raised on an embankment towards the southern region as it passes over the railway line.

Existing Air Pollution Concentrations

SDC Review and Assessment

3.4 Stroud District Council (SDC) carries out frequent review and assessments of air quality within the area and produces Annual Status Reports in accordance with the requirements of Defra. In 2001, the Council declared an Air Quality Management Area (AQMA) for NO_2, which was subsequently revoked in 2004. SDC currently has not declared any areas as AQMAs.

Key Sources of Pollution

3.5 The key sources of air pollution in the vicinity of the proposed allocated site are likely to be exhaust emissions from road traffic using the local road network. In particular, the M5 motorway and the A38 which border the proposed allocated site.

3.6 Traffic flows have been obtained from the Department for Transport website for the M5 and A38. Data obtained from the DfT website for the year 2019 (pre-COVID-19 restrictions) are provided in Table 3.1 below.

Table 3.1: Traffic Flows

Road Link	Annual Average Daily Traffic Flow		
	LDV	HDV	Total
M5	72780	9153	81933
A38 (north of A4135)	14147	886	15033
A38 (south of A4135)	8058	497	8555

3.7 As illustrated in Table 3.1, the traffic flows along these roads are high and have a high proportion of HDV traffic.

Monitoring Data

Nitrogen Dioxide

3.8 SDC monitors NO_2 concentrations within its regulatory area using a network of passive diffusion tubes. Only one diffusion tube (40 – Slimbridge Primary School) is located in the immediate vicinity of the proposed allocated site PS37. Data obtained from the nearest diffusion tubes is presented in Table 3.2 below.

Table 3.2: Annual Mean NO_2 Concentrations (µg/m^3) measured at Diffusion Tube Sites

Location	Grid Reference	Type	2015	2016	2017	2018	2019
40	374327, 202878	Roadside	NA	NA	NA	28.78	10.77
37	378290, 206899	Other	NA	16.67	12.64	20.34	12.68
45	379342, 208604	Rural	NA	NA	NA	NA	10.89
46	380374, 209112	Rural	NA	NA	NA	NA	10.86
35	380232, 210421	Other	NA	24.08	20	21.35	19.15
49	380108, 211214	Rural	NA	NA	NA	NA	18.51
48	382295, 209217	Rural	NA	NA	NA	NA	9.01

Particulate Matter

3.9 SDC monitors ambient PM_{10} and $PM_{2.5}$ concentrations within its regulatory area using continuous monitors. Neither of the monitors are located in the vicinity of the Site, however the rural site at Harefield provides an indication of the background concentrations in the wider area. Data obtained from the closest automatic monitoring sites are presented in Tables 3.3 and 3.4 below.

3.10 The data indicate that annual mean concentrations at both the locations are below the AQS objective levels for annual mean PM_{10} and $PM_{2.5}$ concentrations respectively.

Table 3.3: PM_{10} Concentrations (µg/m^3)

Location	Grid Reference	Type	Averaging Period	2015	2016	2017	2018	2019
Hardwicke	380203, 212842	Suburban	Annual Mean	NA	NA	NA	9.85	10.10
			No of exceedences of 50µg/m^3 (as 24 hour mean)	NA	NA	NA	0	0
Haresfield	381324, 210015	Rural	Annual Mean	NA	NA	NA	9.9	8.58
			No of exceedences of 50µg/m^3 (as 24 hour mean)	NA	NA	NA	0	0

Table 3.4: $PM_{2.5}$ Concentrations (µg/m^3)

Location	Grid Reference	Type	Averaging Period	2015	2016	2017	2018	2019
Hardwicke	380203, 212842	Suburban	Annual Mean	NA	NA	NA	7.14	6.40
Haresfield	381324, 210015	Rural	Annual Mean	NA	NA	NA	7.16	5.82

Background Concentrations

3.11 Monitoring in the local area is limited, additional information regarding background concentrations of NO_2, PM_{10} and $PM_{2.5}$ has been obtained from the Defra UK Background Air

Pollution maps[9]. These 1 km grid resolution maps are derived from a modelling exercise that takes into account emissions inventories and measurements of ambient air pollution from both automated and non-automated sites.

3.12 The latest background maps for NO_2, PM_{10} and $PM_{2.5}$ were issued in August 2020 and are based on 2018 monitoring data.

3.13 The background concentrations for the area of the Site are presented in Table 3.5.

Table 3.5: Mapped 2021 Annual Mean Background Concentrations for NO_2, PM_{10} and $PM_{2.5}$ (µg/m^3)

Pollutant	Average Background Concentration
NO_2	9.7
PM_{10}	13.9
$PM_{2.5}$	8.5

Surrounding Area

3.14 The proposed allocated site is located in close proximity to a number of existing small settlements such as Slimbridge, Cambridge, Gossington and Draycott and larger settlements Cam and Dursley.

3.15 In addition, a number of other large sites in the vicinity have been allocated for development, such as PS24 Cam North West and the committed development Northeast Cam.

[9] http://uk-air.defra.gov.uk/data/laqm-background-home

4 ALLOCATED DEVELOPMENT

4.1 Site PS37 in the draft local plan is allocated for a new garden community comprising:

- 5ha employment;
- up to 1,500 dwellings;
- a local centre including shops and community uses;
- primary schools(s); and
- associated community and open spaces uses and strategic green infrastructure and landscaping.

Trip Generation

4.2 Data regarding the trip generation associated with the allocated development was obtained from the traffic forecasting report[10] as illustrated in Table 4.1 below.

Table 4.1: AM and PM peak and AADT Trip generation

		Trip Generation
AM Peak	Arrivals	270
	Departures	718
PM Peak	Arrivals	449
	Departures	371
Annual Average Daily Flow		11,497

4.3 As illustrated in Table 4.1, the above allocated development would lead to a significant increase in vehicle trips on the local road network.

[10] Mott MacDonald. Traffic Forecasting Report. Stroud Local Plan Traffic Modelling (March 2021)

5 FINDINGS OF REVIEW

5.1 A review of the proposed allocated site PS37 has been undertaken with regards to air quality.

5.2 Although there is limited monitoring data available for the area of the proposed allocated site, the available data indicated that the local pollutant concentrations in the vicinity of the proposed allocated site are below the relevant Air Quality Strategy Objective levels.

5.3 The proposed allocated site is located adjacent to a number of roads with a high traffic flow including the M5 and A38, which border the site. However, the draft local plan does not provide any details of consideration of exposure of future occupants to air pollutants arising from these sources and no details of any set back distances from the roads, or other mitigation requirements for the sensitive uses within the allocated site. The suitability of the Site in terms of air quality and human health has therefore not been demonstrated.

5.4 The proposed allocated site is for up to 1500 dwellings and 5 hectares of employment use. Such a development will likely generate significant road vehicle trips, which as discussed in section 4 is likely to be in the region of 11,500 trips per day. The draft local plan does not include any details of any consideration of the impact of the pollutants arising from the additional road traffic on the surrounding communities. The impact of additional road vehicles of such a magnitude within the surrounding small settlements is likely to be significant.

5.5 The allocated site PS24 and committed development Northeast Cam, which are proposed in close proximity to the allocated site PS37, are also significant sized developments. The cumulative impact of emissions from road vehicle trips generated by these three large developments is likely to be significant and should be assessed cumulatively in order to determine the likely impacts on air quality and ensure the protection of human health.

5.6 Overall, it is considered that in the allocation of site PS37 within the draft local plan there has been no consideration of air quality either with regards to the impact of the allocated development on the local area or the exposure of future occupants due to existing sources of air pollution.

5.7 Policy ES5 of the existing and draft local plan states that an air quality assessment will be required for proposed developments to demonstrate that effective measures can be taken to mitigate the impacts of a development on air quality. The allocation of land for such a large

development without due consideration of the air quality impacts is therefore considered to be irresponsible and in direct contravention of this policy.

APPENDIX A - AIR QUALITY STANDARDS

Table A1: Air Quality Standards

Pollutant	Averaging Period	EAL / AQS ($\mu g/m^3$)	Comments
Particulate Matter (as PM_{10})	annual	40	UK AQO and EU Limit Value
	24-hour	50	UK AQO and EU Limit Value, not to be exceeded more than 35 times per annum, equivalent to the 90.4th percentile of 24-hour means
Particulate Matter (as $PM_{2.5}$)	annual	25 (a)	EU Limit Value
Nitrogen Dioxide (NO_2)	Annual	40	UK AQO and EU Limit Value
	1-hour	200	UK AQO and EU Limit Value, not to be exceeded more than 18 times per annum, equivalent to the 99.8th percentile of 1-hour means
(a) Reducing to 20 $\mu g/m^3$ in 2020			

Appendix 13

Wisloe Green, Gloucestershire

Review of Environmental Noise Assessment

Wisloe Green, Gloucestershire

Review of Environmental Noise Assessment

Revision	Date	Notes	Author	Checked	Approved
Ver. 1-0	18-06-21	E3012	[redacted]		
Ver. 1-1	DRAFT	Minor Amendments			

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1 INTRODUCTION

1.1 Entran Ltd has been commissioned by Slimbridge Parish Council to undertake a review of an existing noise assessment (undertaken by Acoustic Consultants Ltd) for a proposed residential development at Wisloe Green, Gloucestershire.

1.2 The existing noise assessment was undertaken by Acoustic Consultants Ltd (ACL) in September 2019. Each section of the ACL report has been considered in numerical order and comments made where required to indicate areas where further clarification or calculation may be required.

2 SITE INFORMATION AND GUIDANCE

The Site

2.1 The site is between the M5 and the A38, which run along the east and west boundaries, respectively. The Bristol to Birmingham line runs across the southern boundary. The A4135 and Dursley Road intersect the middle of the site.

Adopted Guidance

2.2 Section 4.1 notes that the Local Authority agreed that noise levels would be assessed in accordance with BS 8233:2014 and BS 4142:2014. Assessment in accordance with these standards is deemed acceptable, although it is noted that BS 4142:2014 was superseded by BS 4142:2014+A1:2019 in June 2019 and should have been adopted within this assessment.

3 SURVEY DETAILS

Survey Period

3.1 The assessment period of 12th – 16th September 2019 ranges from Thursday to Monday and is inclusive of weekday and weekend periods. This is considered suitable for the assessment of ambient noise and obtaining background sound levels by statistical analysis.

Equipment

3.2 The equipment used during the survey is of class 1 standards and conforms with BS EN 61672. The equipment is therefore appropriate for use within the assessment. However, it is noted that the Cirrus CR 171C meter and associated CR 515 calibrator had not been calibrated for approximately three years at the time of the survey.

3.3 BS 4142:2014 states that preferably calibrators should be checked “at least once per year and sound measuring systems every two years”. The Cirrus equipment employed for the survey was therefore a year out of calibration at the time of the survey, with the associated calibrator being two years out of calibration. It is not clear if this equipment was employed for obtaining specific levels or for background sound levels but any such measurements would not have been obtained in accordance with the recommendations provided within BS 4142:2014. Notwithstanding this, the calibration drift of ±0.2 dB indicates that the equipment is likely to have been functioning adequately.

Weather Conditions

3.4 Insufficient information is provided for verification of weather conditions during the survey period. However, historical data indicates the weather conditions between the 12th and 16th September 2019 were generally dry and stable and would not have sufficiently affected the survey.

Measurement Positions

3.5 Location A was situated in close proximity to the A38 and the Bristol to Birmingham railway line. It would be preferable to obtain data at a location with a single dominant source in order to better inform the modelling.

3.6 Location B is understood to be representative of the nearby Rocket Rental site and is considered suitable for obtaining an understanding of ambient noise levels influenced by both the nearby road and commercial sources.

3.7 Location C would be suitable for measurement of ambient noise levels from the A4135. Activity from the nearby barn is stated to have not affected the survey. However, the duration of the surveys may not be sufficient to observe any activity that may take place at the barn.

3.8 Location D is considered representative of noise from the M5 and is likely to provide a representative measurement of noise levels from road traffic on the M5.

3.9 Location E is similar to location B in the distance form the A38 and is unlikely to be influenced by activities at the Rocket Rentals site. Location E is therefore likely to provide a suitable background sound level for assessment of commercial noise form the rocket rentals site.

3.10 Location F gives an indication of the local road traffic from the nearby minor roads and would provide a suitable receptor for the calibration of a road noise model. However, this receptor would preferably be situated closer to the road in order to obtain a better understand of night-time LAmax,F noise events.

3.11 None of the measurement locations are likely to be sufficiently close to the road noise sources that an adequate consideration of night time maximum noise events can be made.

4 SURVEY DATA

4.1 Insufficient information is provided to adequately evaluate the data for modelling and assessment in accordance with BS 8233. There is no summary of the 16-hour and 8-hour ambient noise levels or night time maximum $L_{Amax,F}$ noise levels. BS 4142 identifies that a representative background sound level "ought not automatically to be assumed to be either the minimum or modal value" and presents the methodology for identifying the background sound level through statistical analysis. There is no adequate representation of the statistical analysis of background sound levels at any receptor. Further analysis is not possible with the data provided.

Measured Data – Location A

4.2 Verification checks of the SEL derivation presented within Table 4 indicate that these calculations are correct and provide a suitable representation of the SEL.

4.3 Insufficient information has been provided to allow verification of the values presented in Table 5. Visual inspection of Chart 1 suggests that the broadband 16-hour daytime level is accurate. Verification of the night time 8-hour noise level cannot be undertaken. The maximum noise level of 86 dB $L_{Amax,F}$ is likely to indicative of a train pass by.

4.4 There is insufficient information provided to verify the background sound levels presented within Table 6.

Measured Data – Location B

4.5 The noise levels obtained at Location B are substantial and have been significantly influenced by activities at the Rocket Rental site. Noise levels obtained at this location are not conducive to identification of background sound levels or identification of road traffic noise levels.

4.6 The noise levels in Table 7 are likely to be significantly higher than the realistic noise levels due to road traffic. This would result in the road traffic noise model not being representative of the actual road traffic noise levels. However, it would provide worse case if the model was based on these values. Data obtained at this location should not be used for the verification or calibration of road traffic noise.

4.7 It is unclear how the night time $L_{Amax,F}$ noise levels have been obtained. Visual inspection of Chart 2 indicates maximum noise levels exceeded the presented value of 78 dB during the night-time periods.

4.8 The values presented within Table 8 are likely to be suitable for a worse case assessment of commercial activity, based on visual inspection of Chart 2. However, broadband noise levels at this location appear to exceed the presented values in Table 8. No information has been provided to detail how the specific sound level has been derived and no further information about the activities on site is included within this section.

4.9 The background sound levels presented in Table 9 are highly likely to be affected by the activity at the rocket rentals site and are considered to be uncharacteristic of road traffic noise levels. It is likely that background sound measurements obtained at Location E are unsuitable for assessment of the Rocket Rentals site.

Measured Data – Location C

4.10 Insufficient detail data is presented at location C and this location may not be representative of the ambient noise levels from road traffic. Comparison against data obtained at other locations could be undertaken to provide further detail. Sufficient consideration of the presented data cannot be undertaken without further detail.

Measured Data – Location D

4.11 Visual inspection of Chart 3 indicates that ambient noise levels presented in Table 11 agree with the survey data. Night time maximum noise levels appear to exceed those identified within Table 11, with noise levels in excess of 75 dB on multiple occasions.

Measured Data – Location E

4.12 The long-term survey data appears to agree with the broadband data presented in Table 13. There is insufficient information provided to review the derivation of background sound levels.

Measured Data – Location F

4.13 The data in Table 15 appears generally in accordance with Chart 5 from a visual inspection. There are several spurious datapoints where ambient and maximum noise levels are significantly increased in comparison to data either side. It is likely that these events are due to close proximity activity and should be removed from consideration. However, no information has been provided to indicate the nature of these events.

4.14 Insufficient information has been provided to allow sufficient consideration of the derivation of background sound levels.

5 NOISE MODELLING – AMBIENT NOISE ASSESSMENT

5.1 The methodology used to derive the noise model is typically considered suitable for less complex scenarios with a smaller number of road and rail sources. It would be preferable to obtain traffic flows for the surrounding roads to ensure a more robust consideration of the noise contribution from each individual link.

5.2 The use of noise levels at Location B is considered to result in increased noise levels over the actual values arising from the A38. For the purpose of an ambient noise assessment this would provide a more stringent assessment with higher mitigation requirements. If the increased noise levels are due to the inclusion of the Rocket Rentals site, within the modelling of road traffic noise, this should be clarified.

5.3 A basic consideration of mitigation requirements can be made by considering the difference between the measured noise levels and the indoor criteria provided within BS 8233. For example, the identified requirement for the 'higher range' noise levels that fall under the adopted 'blue' category is 39 dB R_w. Employing the basic method identifies that the daytime noise level of 73 dB at Location B would require a reduction of 38 dB R_w+C_{tr}.

5.4 The contours presented in Figures 4 and 5 are too broad and are not conducive to the assessment of ambient noise levels. Noise levels in the southern site in particular need to be considered in further detail in order to adequately understand the level of mitigation required.

5.5 The high-level consideration indicates that the identification of the required façade reduction is likely to be satisfactory. However, the provided mitigation requirements should be given as R_W+C_{tr}, where the specified noise reduction includes allowance for the urban traffic noise spectrum. Corrections for C_{tr} would affect the efficiency of mitigation options and may significantly change the requirements.

5.6 The mitigation requirements are provided as octave band sound levels, which typically allows for a more robust identification of mitigation requirements. However, the octave band noise levels adopted for the identification of mitigation requirements are not presented and the model results are identified as broadband values. Further clarification maybe required to demonstrate how the mitigation requirements have been identified.

5.7 The figure indicates a large area of the site will be in excess of the 55 dB upper guideline noise level during the daytime. It is likely that mitigation is required to suitably reduce ambient noise levels.

5.8 Additionally, the ranges adopted for the presentation of ambient noise levels are too broad to fully understand where impacts begin to arise or to understand the highest calculated noise levels at the site. The upper guideline noise level of 55 dB should be presented within this figure. Due to the large portion of the site which exceeds the upper guideline noise level it would be prudent to increase the number of contour bands and provide a more detailed identification of areas exceeding the external amenity criterion.

5.9 Notwithstanding this, it is acknowledged that BS 8233 states that increased amenity noise levels should not prohibit development provided such noise levels are mitigated as far as practicable. Accordingly, further mitigation is likely to be required and should be appropriately considered.

6 NOISE MODELLING – COMMERCIAL NOISE

6.1 The commercial noise assessment was undertaken using the adopted noise levels presented for location B. Section 7 of the assessment identifies that a plant and wheel wash facility is understood to be used on site. This source is not identified as being active during the survey, although it is unclear if the survey was fully attended. Wheel washing activities would be likely to increase the specific sound level from the Rocket Rentals site.

6.2 Insufficient information is provided to adequately demonstrate the derivation of specific sound levels from the Rocket Rentals site. These levels are not reported and further information should be provided.

6.3 The ground absorption value of 1 is not representative of the stated 'semi soft' ground and is adopted for soft ground. It is assumed that this value has been set as 0.5 within the model, although it is unclear why this value has been adopted as this contradicts the parameters identified for the environmental noise model.

6.4 The background sound level adopted for the assessment is not presented in within any table in the survey results. Additionally, Location F is not considered as representative of receptors in close proximity to Rocket Rentals. It is assumed that the background sound level has been adopted from location B due to the high values. These values are not considered appropriate as they will have been largely influenced by the commercial sources in consideration.

6.5 Location E is likely to be more appropriate as it appears to be situated in a similar environment but without the influence of commercial activities. Adopting the background sound levels identified for Location E would provide a day and night-time level of 54 dB and 44 dB $L_{A90,T}$. These levels are substantially lower than those adopted for the assessment and would materially change the outcome of the assessment.

6.6 Further to the above, the reduced background sound levels (in the absence of commercial activity) would increase the perceptibility of acoustic features. With consideration to the excess of the calculated specific level over the ambient and background levels at Location E it is likely that the identified acoustic features would be highly perceptible. It would therefore be more likely that a minimum +4 dB correction is applied for tonality and +6 dB applied for impulsivity.

6.7 The consideration of the correction for tonality is not considered acceptable due to the identification of 'reverse beeping' on site. Beeping reversing sirens are tonal by design and therefore it is considered that tonality would be perceptible.

6.8 There is no requirement to include a penalty for ‘other’ sound characteristics. The penalty correction for such characteristic is only applicable where a sound is neither tonal nor impulsive.

6.9 Consideration of the assessment presented in Table 19, with suggested amendments in accordance with the above, would result in an excess of +25 dB and +32 dB for the daytime and night-time assessments. This indicates significant adverse impacts would be likely at the receptor position.

6.10 The consideration of context relies on closed windows and sufficient trickle ventilation to suitably reduce the noise ingress at proposed residential properties. Mechanical ventilation is likely to be required in order to allow noise levels to be reduced whilst maintaining suitable airflow at all times.

6.11 Whilst it is possible to mitigate high noise levels to below the internal criteria, the nature of the sources is such that general amenity would be substantially affected by the Rocket Rentals site. The area in close proximity to this site is therefore unlikely to be suitable for development without substantial mitigation to the Rocket Rentals site and activities. Such mitigation should not be asked of an active site which is legally permitted to undertake the current activities.

6.12 The adoption of the background sound levels at Location F is likely to provide a suitable limit for proposed commercial activities. The identified values have been correctly adopted from Location F and are appropriate to apply as worst case limits.

7 SUMMARY

7.1 The ACL report has been considered to identify requirements for further clarification and to ensure compliance with BS 8233:2014 an BS 4142:2014, as agreed with the local authority at the time of assessment.

7.2 The methodology for modelling ambient noise levels, due to road and rail traffic, is likely to result in excessive noise levels from road traffic. This would provide higher noise than may realistically be observed, particularly at the section of the A38 near Location B, due to the influence of commercial activity in close proximity to the monitoring equipment.

7.3 Clarification is needed as to the inclusion of the Rocket Rentals site into the modelling. Identification of individual requirements across the development should also be provided. However, this would typically be undertaken at the detailed design stage.

7.4 There are several areas of inconsistency within the commercial noise assessment that are considered to require further clarification. The derivation of the specific and background sound levels would benefit from further detail. The background sound levels are likely to be unrealistic of the environment in the absence of Rocket Rentals and it is proposed that measurements at Location E are more likely to be representative of this scenario.

7.5 Changes to the adopted background sound level would affect the outcome of the assessment and would significantly increase the excess of the rating level over the background sound level. The changes in the excess will vary depending on representative background sound levels and derivation of specific sound levels and may not increase the excess as significantly as the consideration posited within this review.

7.6 The assessment of commercial activities is therefore not considered adequate and does not provide a representative assessment of the likelihood of impacts in accordance with BS 4142. A revised assessment is likely to be required, taking consideration a more representative background sound level and acoustic feature corrections.

7.7 Internal ambient noise levels are likely to be adequately mitigated with careful consideration during the detailed design stage. However, mechanical ventilation may be required where noise levels are particularly high. External ambient noise levels may be substantially high, particularly at the southern site. Detailed noise contours and calculation information are needed before this can be evaluated further.

7.8 It is unlikely that commercial noise levels from Rocket Rentals would be sufficiently reduced and therefore the layout of the development should be considered to site dwellings away from this area.

7.9 There are inconsistencies within the ACL report that would benefit form clarification. These are not considered to negatively affect the outcome of the BS 8233 assessment, although façade reduction and mitigation requirements should be considered carefully. The BS 4142 assessment may vary significantly with further consideration and may result in a substantial increase to the excess of rating levels over background sound levels.

Appendix 14

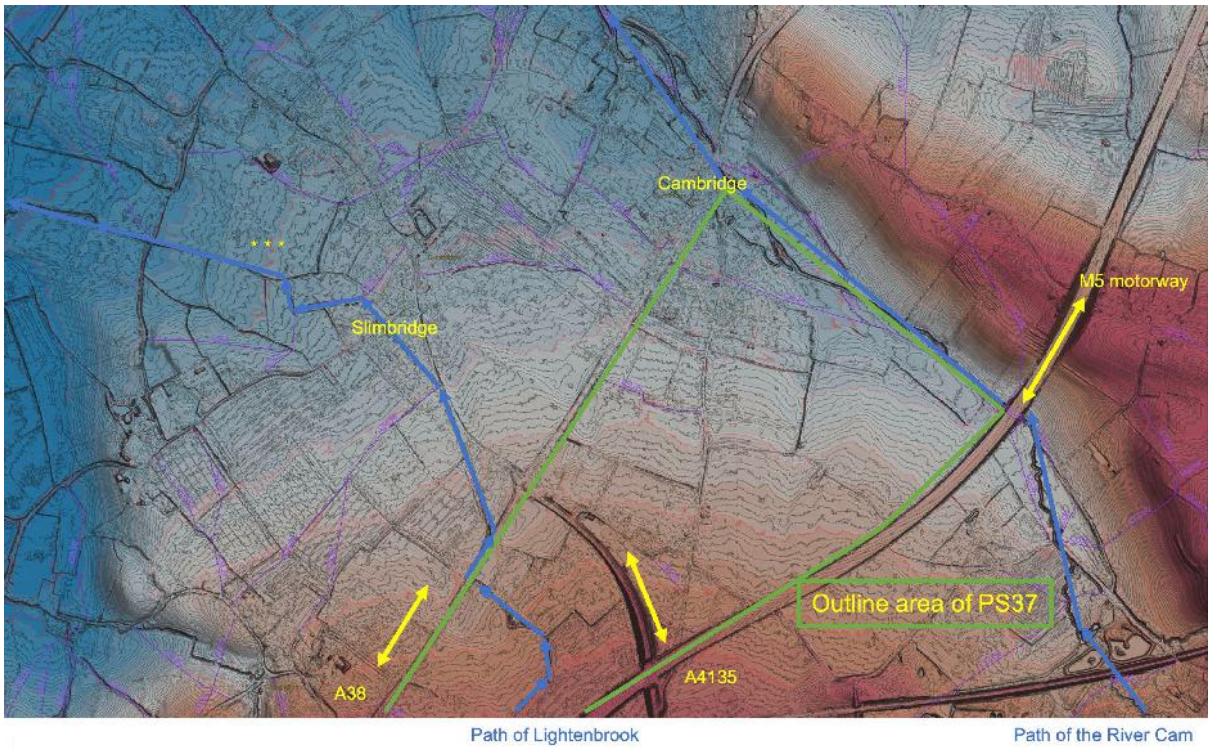
WAG flooding response

Background

1. The Stroud District Council (SDC) Local Plan proposes the development of 1,500 houses, a primary school, nursery, community facilities, shops and a café on land in Slimbridge parish. The land is jointly owned by Gloucestershire County Council (GCC) and the Ernest Cook Trust (ECT). It is high value Grade 2 agricultural land sandwiched between Cam and the villages of Slimbridge and Cambridge and the settlement at Gossington. It is bordered by the M5, which is elevated above the southerly section, and bisected by the A4135 which is positioned on an elevated bank and runs in a north, north westerly direction from Cam and Dursley to the Slimbridge roundabout.

2. In fully understanding the topography it is important to understand that all the existing villages and settlements are downhill and therefore downstream from PS37 Wisloe. Therefore, water runs from the M5 and beyond to the west, across the development. There are two critical paths for surface water, the River Cam and Lightenbrook. The River Cam forms the northerly boundary to the portion north of the A4135. Lightenbrook (or Lighten Brook) emanates from another site included in the Local Plan, PS24 West of Draycott, on the far side of the M5, and goes on to bisect the southerly portion. The A4135 forms an impenetrable raised barrier between the two portions of the proposed development and therefore, for flooding, and indeed, other purposes, the two portions should be addressed individually.

3. This is graphically illustrated on this diagram which uses Environment Agency (EA) lidar contour data. Red areas are high ground, blue areas low.



4. Historically, the low-lying land which makes up the majority of Slimbridge parish has been rich pastureland prone to regular flooding. This is the main reason why the PS37 land is Grade 2, best and most versatile. The construction in 1827 of what is now the Gloucester Sharpness Canal has effectively eliminated the direct flood threat from the waters of the River Severn which had often inundated the land. However, the threat of surface water flooding has remained. There are numerous descriptions and latterly photographs, of Slimbridge and Cambridge villages being inundated by short-lived, but devastating flash flooding. That threat remains today and there have been at least three serious floods in the last 25 years. The most recent and most serious being on 23/24 December 2020.

5. We maintain that including PS37 in the Local Plan poses an existential flooding threat to the adjoining settlements of Slimbridge and Cambridge. The Strategic Flood Risk Assessments and consultant's appraisal used by SDC had serious omissions and errors and left solutions to guesswork that is without foundation.

6. SDC were made aware of residents' concerns in the consultative phase of the draft plan. Eighty eight of the 193 individuals who responded to the consultation highlighted the threat from flooding as a major concern. In common with SDC's general response to the consultation no attempt was made to learn more about how these reservations would impact the selection of PS37. Had SDC taken the responses seriously and investigated residents concerns it would have shown that not only was PS37 unsuitable for development on this scale, but also the other alternatives of PGP1, Land at Grove End Farm Whitminster, and PGP2, Moreton Valence/Hardwicke, neither of which has similar issues, were infinitely preferable. It would also have realised that flood reporting from official sources was deficient. There is no evidence that the consultation responses were treated as anything other than a box ticking exercise.

7. In preparing the 2020 Neighbourhood Development Plan 23.3% of respondents stated they suffered from flooding and 20.5% suffered from sewage problems. 42% of parish households responded to the survey. This data was not available in time to be included in consultation responses but nevertheless emphasises that the threat from flooding is foremost in residents' minds. It must be understood that attributing flood damage to properties is an extremely sensitive subject with the owners and this information was gathered anonymously.

8. This leads to our contention that the existing plan is unsound.

Personal credentials

9. I should establish my credentials. My property is amongst a number of older properties in the parish and, like all the others of its vintage, is prone to garden and property flooding. This is to some degree inevitable as this is the Vale of Berkeley which has been flood prone through its existence. This can never be completely negated and this should be borne in mind when consider extravagant claims of flood mitigation measures provided by the proposers.

10. An example of the existing groundwater level is the well outside my back door. It is five feet deep and in the last twenty-three years, has never been dry and is

frequently full to the surface in winter after prolonged periods of heavy rain. It is a key barometer of groundwater level and was an important tool when I worked with Severn Trent Water (STW) Wholesale Assets Creation - Infrastructure Modelling and Investment Planning - Waste (West) engineer, to build a surface water flooding model to investigate infiltration of the sewage system.

11. In brief, we personally experienced a number of garden flooding incidents from surface water and the sewage system from 1998 onwards culminating in my property being flooded in 2012. See appendix 1. I should add, others will have been flooded on a regular basis long before this and continue to be flooded.

12. I decided it was simply unacceptable to do nothing and have continuously worked on a constructive basis with all those agencies involved. This began with Slimbridge Parish Council and went on to include the Lower Severn Internal Drainage Board (IDB), SDC Water Resources Engineer, District and County Councillors, GCC Highways Local Highway Manager and Lead Local Flood Authority (LLFA), Berkeley Estates Manager and tenants, the Ernest Cook Trust Senior Land Agent and tenants and last, but by no means least, local residents.

13. I gave a public presentation in December 2014 to residents in conjunction with GCC and STW and hosted a meeting involving the GCC highways manager, STW lead engineer and the contractor, Amey, which led to a multiagency effort to simultaneously install a new highway drainage system and implement a sophisticated flood grouting and lining programme for the sewage system in 2016.

14. You will read later in this document how these various agencies woke up to the situation in the parish (Slimbridge village and Cambridge) and have been investing heavily over the last few years to mitigate the effects of repeated flooding events. Recent events have shown that for all the work and investment made the problems continue.

15. The most recent example is on 23/24 December 2020 when the Legion Social Club and a number of properties in Slimbridge and Cambridge were flooded, many directly by the runoff from PS37. See photographs at Appendix 2. The impact of the storm has been documented by GCC LLFA in a summary report[1].

16. As mentioned in lessons learnt, the report notes that it relies purely on reported events at the time.

> *Another issue raised during the debrief sessions and in subsequent reports was the need for a clearer, more consistent list of immediate flooding contacts. It was evident that some residents and local councillors were not clear on who to contact for which elements of the flooding incident.*

17. This is a very important point. Without reporting from those affected there is no official record of the effects of surface water flooding. Occupiers are very reluctant to report house and garden flooding as they feel it will impact the value of their property

[1] December 23rd/24th 2020 flooding: Gloucestershire Lead Local Flood Authority summary report

and ongoing insurance costs. Therefore, all the official documents used to compile the proposers' desk top assessments are inherently flawed and incomplete.

18. The mitigation work goes on with STW planning to build a new model this winter to establish why the sewage system is still not coping in high groundwater and storm conditions. I have played an integral part in this overall effort and have learnt a lot from the professionals involved and achieved a good understanding of local conditions and the prime causes of local surface and river water flooding.

19. Given all those involved I am at a loss to explain why so few pertinent details were included in the desk based Strategic Flood Risk Assessments and the similarly desk based proposers' consultants' assessment. Undoubtedly the very limited reporting and recording of incidents plays a part but, despite being informed in the public consultation phase of the Local Plan, SDC planners made no attempt to compile a more accurate data set.

National Planning Policy Framework

20. I refer to the relevant National Planning Policy Framework (2019) paragraphs shown in bold in making the following observations which would have been available to SDC had it chosen to take the consultation responses seriously.

Inadequate assessment

> **Para 155: "Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (<u>whether existing or future</u>). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere."**

21. Development of PS37 poses a serious threat to the adjacent communities of Cambridge and Slimbridge. The SDC Local Plan fails to give adequate consideration to the effects of surface flooding currently affecting both communities which will be exacerbated by large scale development of the site. Too much emphasis has been placed on the Flood Risk Zones adjoining the site which only consider river and sea flooding without adequate assessment of the existing surface water threat to the adjoining communities of Slimbridge and Cambridge.

Omissions from the Strategic Flood Risk Assessments

> **Para 156: "Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards."**

22. In arriving at the flood risk assessment SDC has depended on advice from the EA and GCC, the Lead Local Flood Authority (LLFA). Unfortunately, neither

organisation compiles accurate records of surface water flooding on agricultural land and has not adequately considered adjacent existing communities. This is despite adequate evidence being made available.

23. GCC spent an estimated £600k installing a new road drainage system through the centre of Slimbridge in 2016 to attempt to mitigate repeated surface water flooding of properties. The system has only been partially effective which was dramatically demonstrated when surface flood water flowing directly from PS37 closed the A38 on 23 December 2020 and flooded St Johns Road, the local social club and a number of properties in Slimbridge and Cambridge.

24. Given the level of expenditure on this project there was clearly a reason for GCC to fund it. Why was this detailed information not made available to SDC planners when GCC LLFA had previously been involved in discussions and meetings with residents to discuss solutions? This project was also specifically mentioned in the residents' consultation responses. GCC Highways managed the project and the council is one of the landowners and proposers for PS37. Why was no effort made to establish the outcome of the project?

25. Similarly, there is no mention of the STW £1.2 million project, also in 2016, to reduce infiltration of surface water into the parish sewage system. The simple fact that surface water flooding can cause such a devastating impact on this critical infrastructure should surely have been taken into account when selecting Wisloe, which is upstream of Slimbridge and Cambridge, rather than one of the alternatives. Incidentally, the flooding pattern in December 2020 exactly matches the EA mapping for a 1:1000-year event. If that is so, what should we expect as climate change increases the frequency and magnitude of storm events? More of this later.

26. A summary of the project[2] shows that Slimbridge was ranked 21st on STW's overall sewer flood risk database placing it in the top 1% in the whole of the authority's area. This was a direct result of the volume and pressure exerted by surface water in flood conditions. Construction on the scale of that proposed for the Wisloe site will inevitably increase the amount and speed of surface water runoff. It should be noted that it will also be necessary to construct a new self-contained sewage system for PS37 feeding into the already stressed Coaley sewage treatment plant. This was noted in the Infrastructure Delivery Plan 2021 (IDP 2021)[3] where PS37 was rated as high risk by STW should the sewage system be connected to the existing Cambridge/Slimbridge system.

27. The IDP 2021 page 42 then goes on to elaborate the situation at PS37:

> *The site is in close proximity to the River Cam and there have been a number of recent sewer flooding events since 2007 affecting highways and the curtilage of properties.*
>
> *The site is included within the Environment Agency 2007 River Cam and Wickster's Brook detailed hydraulic model, but only a minor proportion of the*

[2] Severn Trent Slimbridge Infiltration Reduction (2019)
[3] Local Plan Review: Infrastructure Delivery Plan 2021 - Main Report - ARUP - 1 June 2021

site (1%) is considered to be impacted by fluvial flood risk. The site is at high risk of groundwater flooding, with a greater than 75% chance of groundwater emergence within a given 1km2 grid square, during a 1 in 100-year event. My emphasis

The Sequential Test must be satisfied. Only once the Sequential Test is satisfied should the Exception Test be applied. It is anticipated that proposed development will be sequentially located within Flood Zone 1.

The ordinary watercourse on the northern site will need to be surveyed and mapped as part of any application. Any proposals for drainage will have to be split into the separate catchments. The western side of the site north of the A4135 may be difficult to drain to the ordinary watercourse given the levels. My emphasis

A site-specific flood risk assessment will be required because the site is within Flood Zone 2 and 3 and at risk from sources of flooding other than rivers and the sea.

28. How much clearer does it need to be that the development poses a huge risk to downstream communities!

29. In the conclusions on page 44 the IDP 2021 states:

All major applications, and those sites in Flood Zones 2 and 3, require a flood risk assessment. It is expected that developers accord with the drainage hierarchy, creating flood storage where appropriate and implement measures to ensure that surface water is not increased onsite or elsewhere. My emphasis.

Any flood risk schemes should be delivered (or funded) entirely by developers, unless the scheme were to have wide-ranging benefits for other development sites or for existing properties.

30. It is our contention that the difficulty and cost of attempting to develop an effective drainage scheme to protect Slimbridge and Cambridge from the effects of development will make PS37 unviable.

Para 157: "All plans should apply a sequential, risk-based approach to the location of development – taking into account the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:

a) applying the sequential test and then, if necessary, the exception test as set out below;

b) safeguarding land from development that is required, or likely to be required, for current or future flood management;

c) using opportunities provided by new development to reduce the causes and impacts of flooding (where appropriate through the use of natural flood management techniques); and

d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.

31. The Ministry of Housing, Communities & Local Government guidance on flood risk and coastal change advises how to take account of and address the risks associated with flooding and coastal change in the planning process.[4] The guidance explains in detail the application of the sequential and exception tests in relation to EA Flood Zones 1-3 and the impact on sustainability.

32. A thorough sequential test using accurate and reliable data would have shown that PS37 was the most at risk of flooding of all the alternative sites and should not have been included in the Local Plan for this reason alone.

33. PS37 borders the River Cam which is a river susceptible to river flooding and attracts both Zones 2 and 3 bordering the site and encompassing large parts of the existing settlement of Cambridge. What the sustainability assessment fails to take account of is the impact of surface water flooding. The SDC SFRA detailed site summary[5] alludes to, but does nothing to properly explore, the implications of going ahead with the development. Therefore, the sustainability assessment for PS37 is fatally flawed.

34. The SFRA notes that Lightenbrook, which is an ordinary watercourse, bisects the southerly section of the site. The fluvial section of the SFRA notes the lack of any detailed hydraulic modelling for this watercourse. Given the importance of Lightenbrook, which flows from another site in the Local Plan, PS24, West of Draycott, under the M5 and then directly through the centre of Slimbridge village, this is a major omission and should have been assessed before PS37 was considered for inclusion in the Local Plan. Nowhere in any of the assessments is there any reference to the impact of developing PS24 and its likely impact on PS37, Lightenbrook and Slimbridge village. This when flash flooding from the brook is the prime cause for flooding in the village and this risk was clearly mentioned in the IDP.

35. The site is largely prime agricultural land and therefore there is no direct record of surface water flood incidents. The SFRA states that the record of sewer flooding incidents is incomplete. This is despite the forementioned expenditure of £1.8 million by GCC and STW in attempting to counter surface water flooding incidents in both Cambridge and Slimbridge.

[4] Ministry of Housing, Communities & Local Government - Flood risk and coastal change published 6 March 2014

[5] SDC Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables - Draft Document - JBA Consulting undated

Wisloe Green Flood Risk & Surface Water Site Appraisal

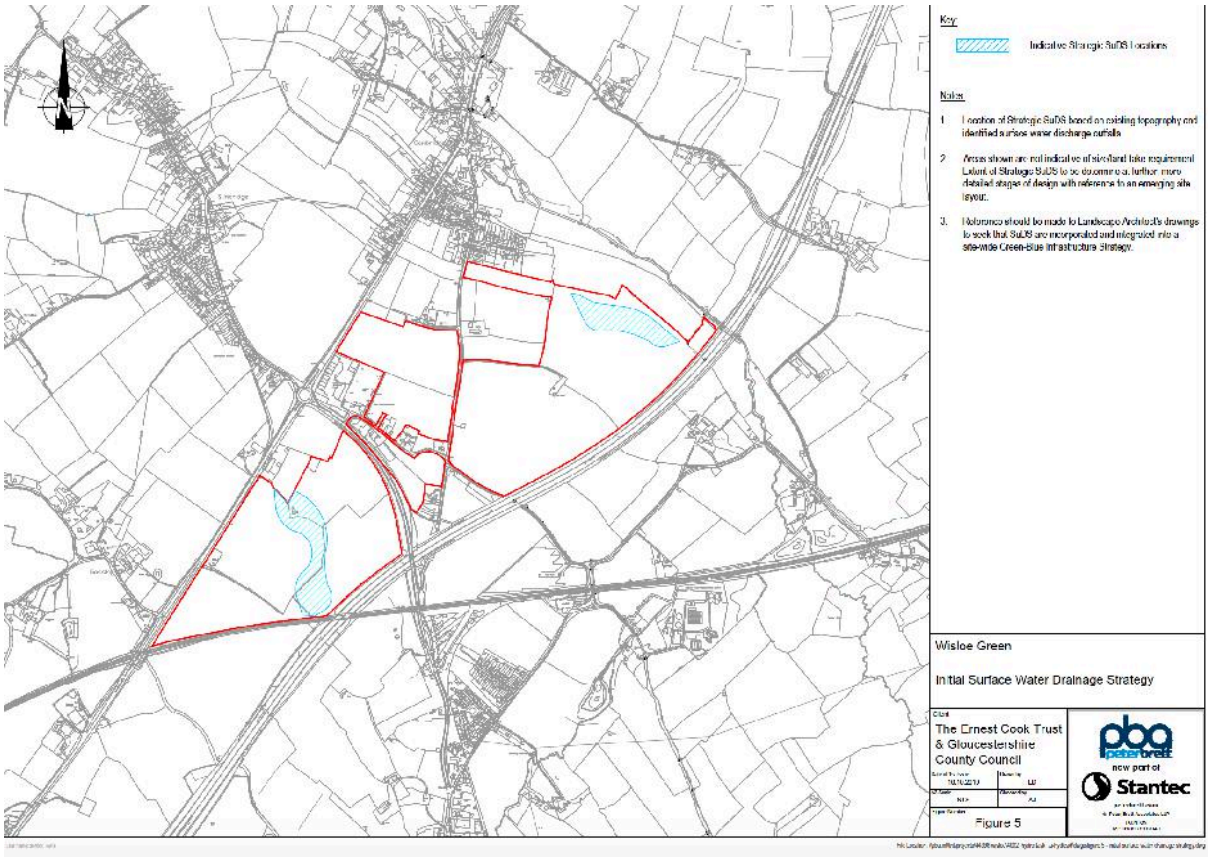
36. The Stantec report commissioned by the proposers[6], GCC and the ECT in 2019, on which SDC depended for the reliability of the sustainability assessment is riddled with fundamental errors and omissions. It states at 2.7.1. that requests for information have been sent to statutory consultees: GCC LLFA, SDC, STW, Lower Severn IDB and the EA. No response had been received from STW, Lower Severn IDB and SDC when the report was concluded. Responses had been received from the GCC LLFA and the EA. We already know the EA do not keep records of surface water flooding on agricultural land, simply a predicted map based on topography.

37. GCC LLFA says it is aware of a known downstream flood risk and that discharge rates should preferably be limited to existing present-day rates up to the 1:100-year event. This is incorrect. It is not preferable, nor should it be reference to the 1:100-year event rate. Flooding is already being experienced from the site at the 1:1,000-year event rate. Reference 3 states that 'Developers must seek opportunities to reduce overall level of flood risk both on and off-site, for example by reducing volume and rate of runoff and creating space for flooding'. See also NPPF para 155 given earlier which makes protection of surrounding settlements mandatory.

38. The Stantec report suggests this can be achieved by constructing two vast storage attenuation areas, one in each section of the development. It calculates the need to accommodate between 771 and 967m3 of attenuation storage per hectare of impermeable development. As the report states, the whole 82 hectares of the site is underlain with a bedrock of Blue Lia Formation and Charmouth Mudstone Formation Mudstone and therefore all of it is considered impermeable. This then equates to a requirement for between 63,222 and 79,294m3 of attenuation storage. The map below shows the likely extent of the required storage. While Note 2 states that the areas are not indicative of size/land-take requirements. Earlier incomplete information on the nature of Lightenbrook suggests that the area shown is an underestimation. This is further explained later.

39. What the report also fails to consider is the effect of the high ground water level. Had they been asked; any local farmer or landowner would have told them these storage areas will already be lakes when needed to accommodate flash flooding from a storm following a prolonged period of rainfall. If you dig a hole anywhere on this land it will fill with water. This plan has zero credibility and will be totally ineffective in preventing serious flooding in Slimbridge and Cambridge. Credible alternatives for disposal of this volume of flood water in these conditions simply don't exist. Should development of PS37 be included in the Local Plan these measures will be assessed and found wanting, leading to the refusal of planning permission. It should also be noted that these ponds require regular maintenance and if SDC are not going to funds this then residents are going to be saddled with payments to a management company.

[6] Wisloe Green Flood Risk & Surface Water Site Appraisal - Peter Brett part of Stantec - 11 October 2019 on behalf of ECT and GCC



40. As an aside, there is no reference in the Stantec report to the requirement given in the Level 1 SFRA 11.8.4 for an allowance of 8m development easement from the top of the bank on either side of a watercourse. Fencing will be required around the attenuation storage areas and Lightenbrook in the south, and alongside the River Cam in the north, to prevent access and reduce the risk to human life at all times. This is particularly so for children who will naturally be drawn to rivers and lakes. Application of this easement along the course of Lightenbrook and around the contiguous attenuation lake effectively cuts the southerly site in two.

41. Lightenbrook is not a gentle stream for the new residents to stroll along as portrayed in the proposer's literature. It is an essential element of land drainage at all times of the year and a dangerous water course in storm conditions which will need to be adequately maintained and protected from access at all times. It most certainly should not be straightened and profiled to speed up flood water as suggested in the report. This is quite possibly the worst proposal in an already deficient report and would create havoc in Slimbridge, overwhelming the banks of the brook in the built-up areas through which Lightenbrook flows. This includes the primary school, social club and numerous residential properties.

42. In summary, the Stantec report is packed with basic errors and false assumptions. Any sort of rigorous review by SDC based on the responses to the consultation would have revealed these as misleading and likely to result in a flawed sustainability assessment. It seems the report was taken at face value.

Para 67: "...planning policies should identify a sufficient supply and mix of sites, taking into account their availability, <u>suitability and likely economic viability</u>."

Para 158. The aim of the sequential test is to steer new development to areas with the lowest risk of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.

43. The process for the application of the sequential test for local plan preparation clearly states:

> *A local planning authority should demonstrate through evidence that it has considered a range of options in the site allocation process, using the Strategic Flood Risk Assessment to apply the Sequential Test and the Exception Test where necessary. This can be undertaken directly or, ideally, as part of the sustainability appraisal. Where other sustainability criteria outweigh flood risk issues, the decision making process should be transparent with reasoned justifications for any decision to allocate land in areas at high flood risk in the sustainability appraisal report. The Sequential Test can also be demonstrated in a free-standing document, or as part of strategic housing land or employment land availability assessments.*

44. Reference 3, the Ministry of Housing, Communities & Local Government guidance on flood risk and coastal change, details an extensive list of recommendations for Local Plan policy that must be complied with under the sequential test and should have been applied to PS37. It then goes on to list an extensive range of guidance measures which will need to be considered by any developer. These include many of the measures that make PS37 unsuitable in the way that it impacts the local settlements. Postponing consideration of the implications of failure to achieve the desired outcome at any early stage by SDC has led to a situation where it is most likely that planning permission will subsequently be refused. The Flood Risk Sequential Test for the Local Plan (2014) does not include PS37, PGP 1 or PGP 2.

45. Development of PS37 is unnecessary in order to fulfil the housing requirement as better, less flood prone, alternatives are available at PGP 1 and PGP 2 which were considered as alternatives and then not included in the final Local Plan. A sequential test using accurate data should have been used to assess the relative merits of PS37, PGP 1 and PGP 2.

46. In the Stroud Level 2 SFRA[7] used in the Local Plan the table on page 23 shows a flow chart 'Flood risk and preparation of Local Plans' which at step 4 offers an option to bypass the sequential test if the developments under consideration are located entirely within areas with low probability of flooding. It appears SDC chose

[7] Stroud Level 2 Strategic Flood Risk Assessment - Draft Report - November 2019

to assume that the area around PS37 was in a low probability of flooding area thereby bypassing the next step which would have required a sequential test of all sites under consideration. PS37 is not within an area with a low probability of flooding and therefore a sequential test between alternative sites should have been undertaken.

47. Indeed, paragraph 4.5 of the reference specifically refers to Slimbridge as being susceptible to substantial surface water accumulation and ponding. The photograph at appendix 3 was taken as I write this report on 4 July 2021. This is mid-summer. Things will be far worse in the winter. Unless this situation has been reported to GCC LLFA it will not feature in official statistics. There is no excuse for SDC and GCC not being aware of the situation and looking more closely at the implications for PS37 before including it in the Local Plan:

> 4.5 - *Surface water accumulation and ponding is substantial around the towns of Arlington, Berkeley, Sharpness and Slimbridge during the 1 in 30-year rainfall event and greater return periods.*
>
> *The recorded surface water flooding history correlates with the modelled surface water flood risk. Of the surface water flooding incidents reported by Gloucestershire County Council, the majority occurred in July 2007, a further seven occurred in November 2012 and one occurred in 2018. Many of the incidents occurred in the south-western area of Stroud District, which is susceptible to large areas of surface water ponding, and the internal flooding of properties.*

48. Surface, sewer and river water flooding is common in Cambridge:

> 4.6.1 - *Gloucester and Sharpness Canal*
>
> *The Gloucester and Sharpness Canal is found in the north-western area of the district. The raised canal embankments act as an informal line of defence. Many watercourses discharge into, and interact with, the canal and consequently, flooding of the canal has the potential to cause waters to back up, causing flooding further upstream.*
>
> *For the River Cam and Wickster's Brook, a series of flood defences have been constructed whereby the watercourse discharges into the canal (detailed in Section 4.2.6). Along the canal, several overtopping and breach events have occurred, in particular during 2007 and 2008. The flood events are clustered along four locations along the canal: near Parkend, between Upper Framilode and Whitminster (where the River Frome passes below the canal), near Slimbridge, and in the north along the district border near Quedgeley. All of these flood events have occurred as a result of high-water levels in the canal and heavy rainfall.*

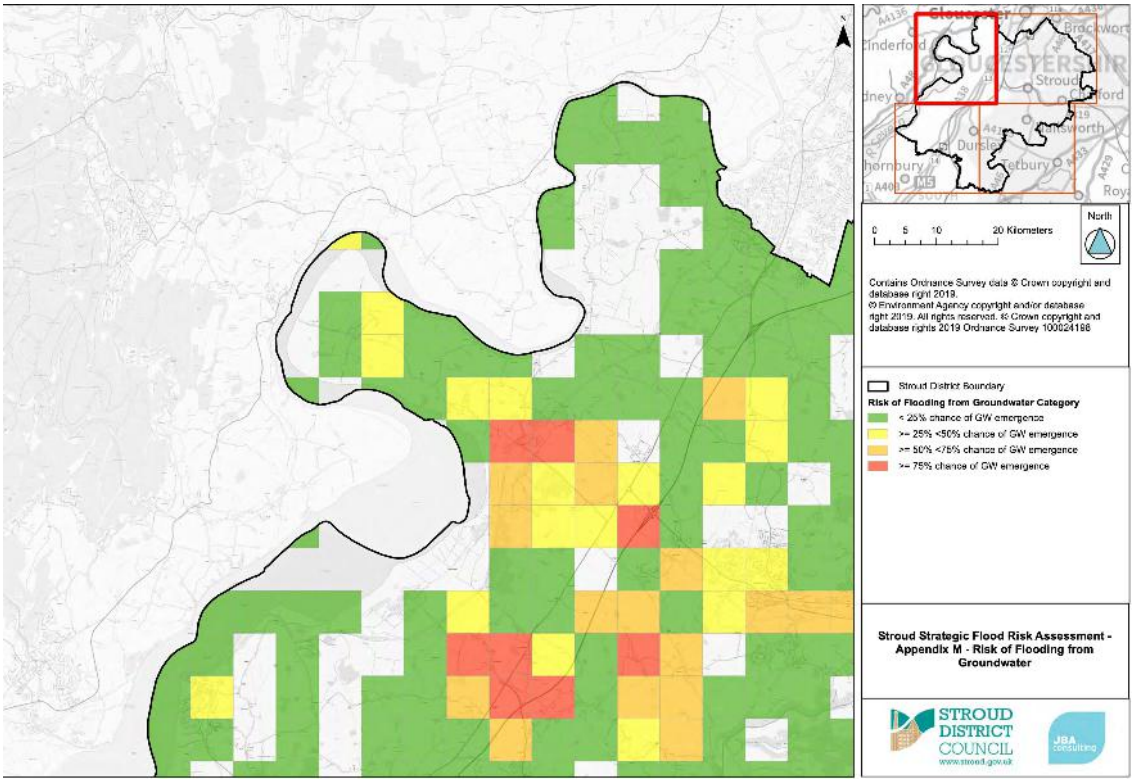
49. This system of flood defence (Severn Trent Water Authority River Cam and Wicksters Brook Improvement Scheme 1980) failed in December 2020 causing flooding to farms and properties on Ryalls Lane near the junction of the River Cam and the canal. We can find no evidence that the scheme has been reviewed or the

river dredged in the last 40 years despite extensive house building along the course of the River Cam. This demonstrates how vulnerable the river is to neglect and forced over capacity.

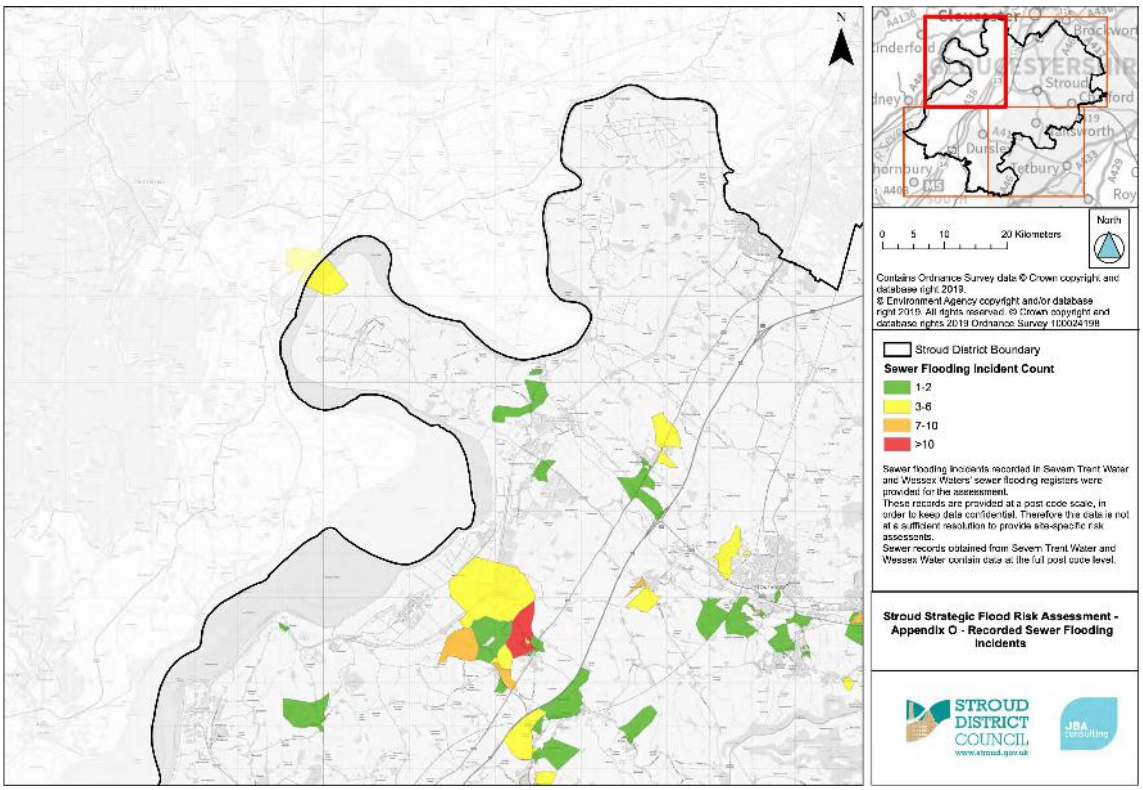
> *6.3.5 Groundwater Mitigation*
> *Groundwater flooding has a complex, and very different flood mechanism to any other and for this reason many conventional flood defence and mitigation methods are not suitable. An available option to manage groundwater flood risk would be through building design (development form), ensuring Finished Floor Levels are raised 300mm above the water levels caused by a 1 in 100-year plus climate change event. Site design would also need to preserve any flow routes followed by the groundwater overland to ensure flood risk is not increased downstream. Obstruction of sub-surface flows by buried services and basements should be avoided.*
> *When redeveloping existing buildings, it may be acceptable to install pumps in basements as a resilience measure. However, for new development this is not considered an acceptable solution and basements should be avoided in high groundwater zones.*
>
> *The management of groundwater also requires consideration during the construction process, as there is a risk that groundworks can lead to releases of groundwater, and/or provide a pathway for the contamination of groundwater. Consultation with the Environment Agency is recommended.*

50. This paragraph is relevant for two reasons. The Wisloe site has a near surface groundwater level and, while new build houses can be raised to alleviate the effects of flooding, existing buildings in Slimbridge and Cambridge cannot. Secondly, the option of directing flood water from the site to the River Cam will introduce domestic and industrial polluted water to the river which feeds the canal, the Bristol Water treatment plant at Purton and, by siphon, the Wildfowl & Wetlands Trust freshwater lakes. This area is a Ramsar site, a Site of Special Scientific Interest, and a Special Area of Conservation under the EU Habitats Directive. The implications of contaminating an internationally acclaimed site and Gloucestershire's number one tourist attraction, the nature reserve wetlands, with domestic and industrial pollution, don't bear thinking about.

51. Appendix M to the SFRA highlights the risk of groundwater flooding (>=75%) in the southerly section (Lightenbrook) of the site.



52. Appendix O to the SFRA gives a reasonable picture of the sewer flooding incidents downstream of the site.



Precautions and warnings are being ignored

> **Para 160. The application of the exception test should be informed by a strategic or site-specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. For the exception test to be passed it should be demonstrated that:**
>
> **a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and**
>
> **b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.**
>
> **Para 161. Both elements of the exception test should be satisfied for development to be allocated.**

53. There was ample evidence both from the respective SFRAs, the IDP 2021 and the information provided by residents to the consultation phase, to alert SDC to the dangers of extensive development in the Slimbridge and Cambridge area, which is prone to and, with the effects of climate change, will become increasingly prone to, surface water and river flooding.

54. The newly built estates on the banks of the River Cam in Cam are already contributing to increased domestic and industrial run off and further development is foolhardy when more sustainable alternatives had been assessed.

55. PS37 offers no sustainability benefit to the adjoining settlements that could possibly offset the increased flood risk. As mentioned earlier, suggestions that floor levels could be elevated on the site is not an option to those downstream who live in existing properties already at risk.

56. Steadily increasing numbers of flooding incidents in Slimbridge and Cambridge, despite extensive mitigating projects from STW and GCC, indicate the early signs of what climate change will bring.

Conclusion

57. SDC planners had ample opportunity to gather important flood data from the local communities, GCC and STW which would have supplemented the inadequate official sources. This was pointed out in the initial consultation and ignored. The consultants relied entirely on GCC LLFA and EA data which is incomplete as it relies entirely on reported and, in some cases, outdated information. This is graphically illustrated in the difference between actual events and reported events on 23/24 December 2020. There is no mention of the flooding in Slimbridge and the closure of the A38 in the GCC LLFA report. The actual situation is shown in appendix 2. It could be argued that the same lack of reporting applies to both the alternative sites at Whitminster and Morton Valence/ Hardwick, however, those sites do not have the

same documented historic flooding problems that Wisloe/Slimbridge experiences. We feel the independent inspector has the opportunity to review the flooding data from the three alternatives - which were available - PS37, PGP 1 and PGP 2 which we believe will conclude that PS37 was the least sustainable option.

58. If PS37 remains in the Local Plan, then the serious omissions mentioned above will manifest themselves when advanced planning takes place, and the potential for development will then be fatally compromised both economically and practically. This is particularly true when looking at the calculated attenuation rates which relied on underestimated figures. The lakes on the Wisloe site required to hold back surface water will need to be far larger than indicated if the legal restricted flow requirements are to be met. Importantly, residents of Slimbridge parish will know who is responsible if this reckless plan is approved.

59. It is worth closing on two quotes from the GCC LLFA 23/24 December 2020 report which was compiled after the proposers' consultant's report as they illustrate the level of miscalculation in the available data at the time:

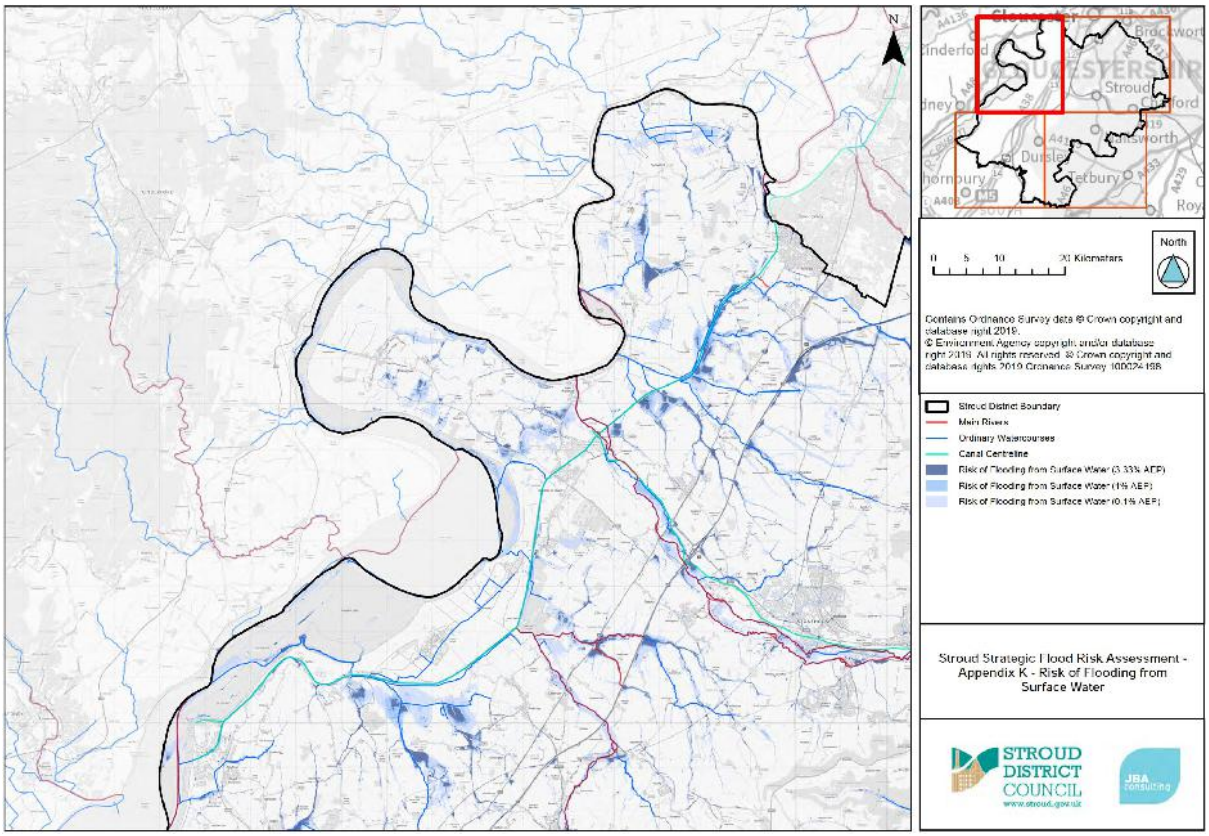
> *The event was characterised by a short period of intense rainfall that fell on saturated ground and elevated river levels. From the morning of the 23rd until midnight, the county saw nearly 16 hours of rainfall, with some locations reaching nearly 60mm. The rivers responded quickly with levels on some reaching their highest recorded peaks. Over 450 properties were affected, with over 300 internally. Drawing comparisons with historical flooding events can be misleading as critical monitoring infrastructure is now much more widely spread, but based on data collected thus far, it is safe to say that December 2020 was the most severe flood event since July 2007. With the accelerating impacts of climate change, short, intense, geographically diverse rainfall events such as these will become the norm as opposed to the exception, and valuable lessons must be learnt and acted upon to increase the county's readiness and resilience.*
>
> *The return period for a rainfall or flood event is a way of calculating the likelihood, and therefore the size, of the event. The underlying principle is that the larger the storm, the less likely it is and therefore the less frequently it will be seen. The return period can be written in two ways; 1 in x years or x% AEP (Annual Exceedance Probability). They mean the same thing so a 1 in 100 year storm will have a 1% chance of happening each year (AEP).*
>
> *According to the radar data in Meniscus Map Rain (not the rain gauges, which in some cases exceeded the radar rainfall), the return period for the event was relatively low at less than 1 in 5 years (20% AEP) for most areas. The return period at Tewkesbury was 1 in 8 years (12.5% AEP) and 1 in 7 years (14% AEP) for Bishop's Cleeve.*

60. The SFRA[8] data used by the proposers in making their calculations in 2019 is shown on the map below. The conditions experienced and witnessed by residents in December 2020 exactly match the light blue, 0.1 AEP area on the map. As stated in

[8] Stroud L2 SFRA - Stage 1 Draft Report v2.0 (Nov 2019) Appendix J

the GCC report, that AEP is now 20% not 0.1%. Therefore, it is 200 times more likely to be experienced. Now it is once every 5 years, not once every 1,000 years.

61. The frequency and severity of surface water flooding at Wisloe is far higher than the proposers have allowed for and for this, and all the other reasons above, show the proposed surface water flooding mitigation measures are inadequate and cast the deliverability of the whole development in considerable doubt. The proposed size of the attenuation ponds is a clear underestimation. The revised size which will be required at the planning stage, should the development be allowed to proceed, will be far larger and harder to manage than envisaged in the confined space of the development.



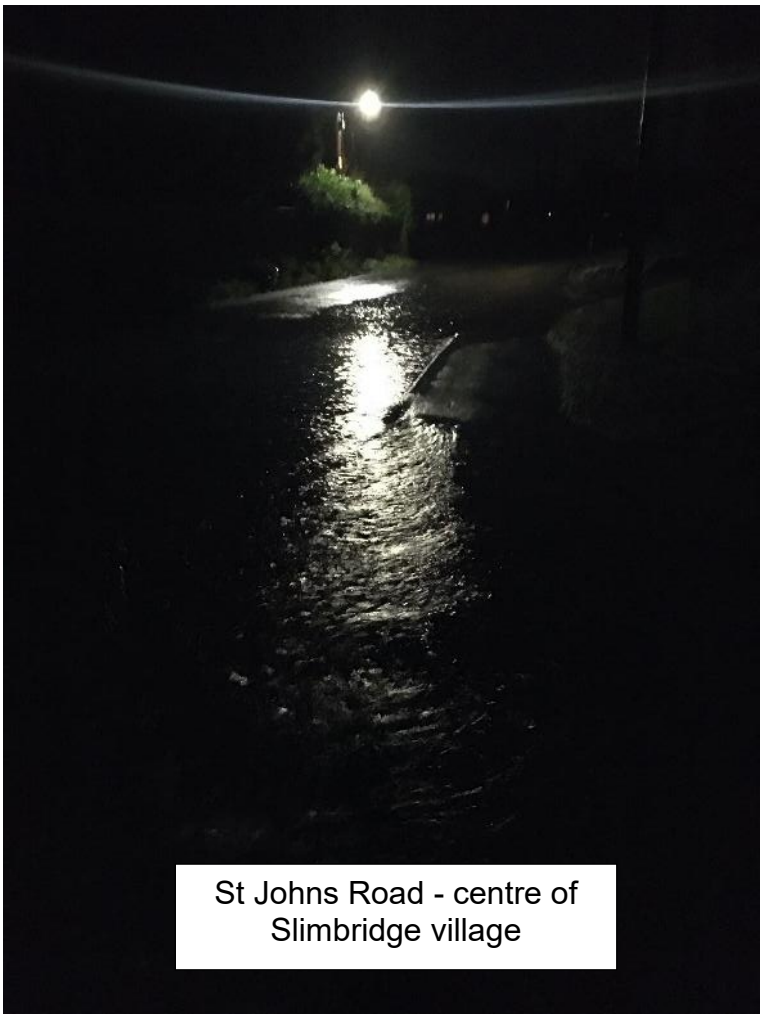
The inclusion of Wisloe in the Local Plan is unsound when more sustainable alternatives were available, evaluated, and then discarded.

Appendix 1.

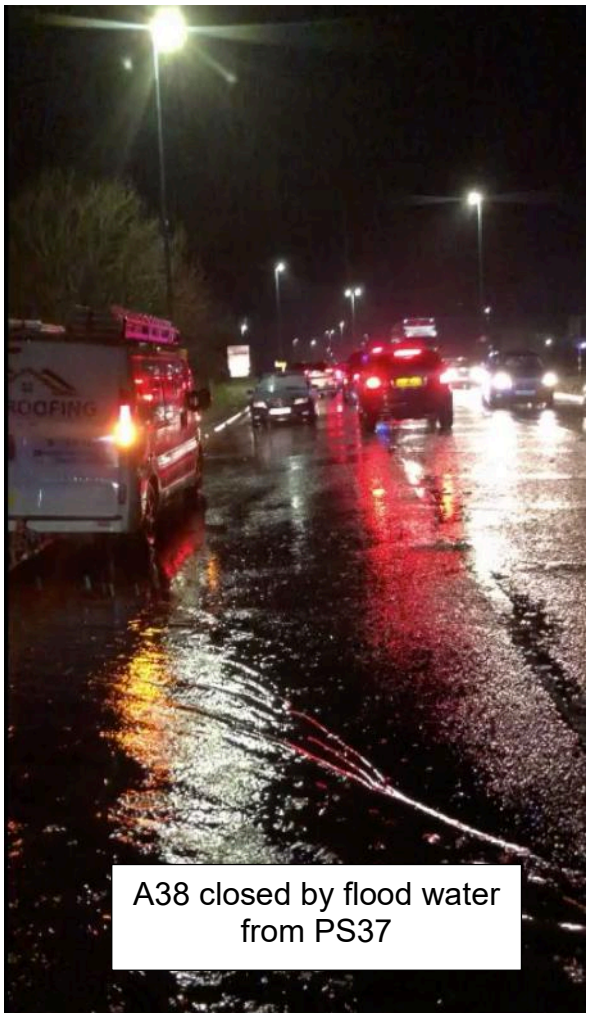
Flooding pictures November 2012

Appendix 2.

Flooding from PS37 23 December 2020



St Johns Road - centre of Slimbridge village



A38 closed by flood water from PS37

Fields around the village still flooded days later. The church can be seen in the distance

Appendix 3

Flooding on St Johns Road at Rectory Farm in Slimbridge village - 4 July 2021

Appendix 15

December 23rd / 24th 2020 flooding:

Gloucestershire Lead Local Flood Authority summary report

gloucestershire.gov.uk

Gloucestershire COUNTY COUNCIL

December 23rd / 24th 2020 flooding:

Gloucestershire Lead Local Flood Authority

Summary report

Introduction

The following report summarises the scale of the flooding seen across Gloucestershire on the 23rd and 24th December 2020, alongside its immediate and longer term impacts. It is intended to take a multi-agency overview of the response to the incident, but concentrates specifically on the Gloucestershire County Council (GCC) teams with a direct role in flood risk mitigation, response, recovery and resilience including Gloucestershire Highways, Gloucestershire Fire and Rescue (GFRS), Civil Protection Team (CPT) and the Lead Local Flood Authority (LLFA).

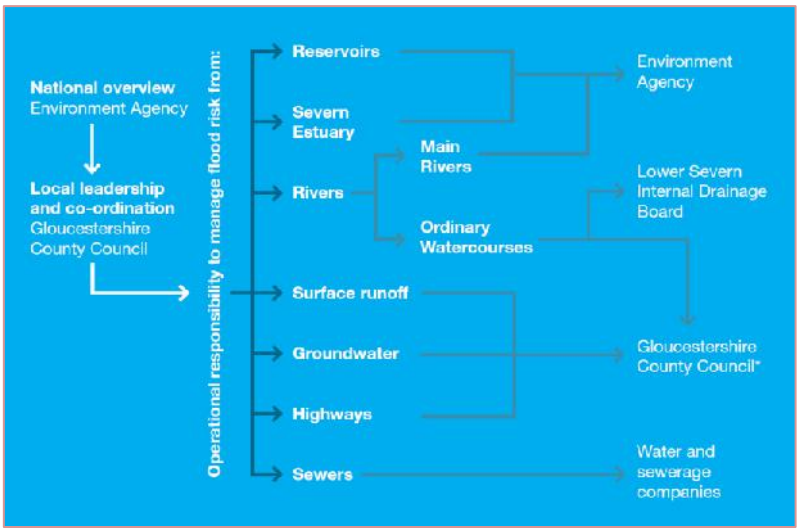
The event was characterised by a short period of intense rainfall that fell on saturated ground and elevated river levels. From the morning of the 23rd until midnight, the county saw nearly 16 hours of rainfall, with some locations reaching nearly 60mm. The rivers responded quickly with levels on some reaching their highest recorded peaks. Over 450 properties were affected, with over 300 internally. Drawing comparisons with historical flooding events can be misleading as critical monitoring infrastructure is now much more widely spread, but based on data collected thus far, it is safe to say that December 2020 was the most severe flood event since July 2007. With the accelerating impacts of climate change, short, intense, geographically diverse rainfall events such as these will become the norm as opposed to the exception, and valuable lessons must be learnt and acted upon to increase the county's readiness and resilience. A summary of property flooding across the county is provided in Appendix 1, and a summary of rainfall and river levels is in Appendix 2.

Lead Local Flood Authority

The County Council as LLFA has a wide range of responsibilities under legislation including the Flood and Water Management Act 2010. These include:

- Investigating and reporting flooding incidents;
- Managing flood risk from surface water, groundwater and ordinary watercourses;
- Producing a local flood risk management strategy;
- Statutory consultee on major developments;
- Consenting works on ordinary water courses; and
- Enforcing works to maintain the flow on ordinary water courses.

The LLFA also has as a local coordinating role, working alongside other Risk Management Authorities (RMAs). The following table explains these various roles and responsibilities:



*GCC includes the LLFA, Highways and GFRS and Civil Protection Team (N.b: GFRS and CPT responsibility extends only to incident preparation, response and recovery). It is also essential to note that District Councils also play a pivotal role in flood risk management which covers preparation, response, investigation and recovery. All Gloucestershire RMAs work as part of an extended, collaborative, multi-agency flood risk management team.

As part of the GCC role, a significant annual investment is made to support flood risk management. Since 2008, a minimum of £2.1million a year is made available for teams, projects and schemes to increase the flood resilience of the county. This investment includes GCC-led studies, initiatives and practical resilience measures including management of the highway drainage network and flood alleviation schemes. It also provides funding to contribute towards third-party flood alleviation schemes, often led and delivered by District Councils.

In line with the LLFA coordination remit, very soon after the event a series of District-based, multi-agency flooding debrief events were arranged. These were aimed at comparing notes and reports across the different agencies to build up an accurate picture of the event, to discuss lessons learnt and to agree short and longer term actions. Attendees included:

- LLFA;
- Gloucestershire Highways;
- CPT;
- District Councils (primarily flood risk / water management engineers);
- Environment Agency (EA); and
- Water and Sewage Companies (primarily Severn Trent Water).

This was an unprecedented and successful approach to incident assessment and investigation that will provide an effective working model for future events. The fact that the various RMAs were able to come together in such a short space of time was testament to the commitment to partnership working held by all parties. In addition to lessons learnt

and next steps, the sessions provided the basis for the LLFA-led impact and rainfall / river level summaries in Appendices 1 and 2.

Lessons learnt:

Further evidence was provided through the debrief sessions, and by the event in general, of the crucial role played by District Council officers. Not just assisting with incident response during a national lockdown, but the immediate efforts to investigate the full local impacts of the event. Without this valuable and expert resource, response to and recovery from flooding events would be far less effective. These teams are often very small and under-resourced (in some Districts just a single officer). Based on the December event, further consideration will need to be given to how the District resource is supported centrally if it is to fulfil its flood risk management potential.

An additional local resource that helped communities prepare for, and react to, the flooding is provided by local flood wardens and flood action groups. These schemes are more active in some areas than others, but are an example of positive local action that could be replicated in other areas if central support was increased.

Another issue raised during the debrief sessions and in subsequent reports was the need for a clearer, more consistent list of immediate flooding contacts. It was evident that some residents and local councillors were not clear on who to contact for which elements of the flooding incident. The LLFA provides a detailed flood guide containing information on how to prepare for, react to and recover from flooding which was revised and republished as an online resource shortly before the December event, and distributed via press release and social media channels. This contains all of the relevant contact details for the various RMAs, including how to report incidents on line (including the LLFA's Flood Online Reporting Tool, FORT) but a separate contact list was nevertheless developed immediately after the debrief sessions, agreed by all partners, and subsequently distributed widely / published on line (see Appendix 3).

Whilst there is an extensive resource allocated to flood warnings and river level / rainfall alerts across the RMAs, primarily by the EA, some of the initial warnings leading up to the 23rd may have under-estimated the speed at which the river levels responded to the rainfall and the impacts of surface water flooding. No one organisation has a 'crystal ball', and the response was nevertheless excellent, but attention may need to be given to strengthening this aspect of the county's preparedness, perhaps involving a programme of investigation / assessment / extension of flood warning infrastructure.

Increased frequency of high intensity storm events as those seen in December is resulting in increased activation of Combined Sewer Outlets (CSOs) to prevent internal sewer flooding in places like Cirencester, where the sewer system is predominantly an old combined sewer system. Increased frequency of CSO discharge to watercourses will have serious negative impacts on the aquatic environment and human health. Although complex and costly, a strategic review of sewer networks and CSOs, led by Water and Sewage Companies, is urgently required.

Individual property flood resilience funding is often made available by Government following major events, to enable households to be better protected from flooding and to speed their recovery. Eligibility criteria for these grants can often be overly restrictive and key communities can often miss out. To date, no such grants have been announced to cover the December event, and this leaves local authorities across the country facing the decision to fill the immediate need with local funded and delivered grant schemes.

A wider, catchment-scale approach to flood risk management needs to be strengthened alongside 'traditional' flood alleviation schemes. This is already in place in some areas, but this holistic approach, combining upstream land and natural flood management needs to be more widely implemented and centrally supported across the county. The LLFA has recently combined forces with neighbouring LLFAs to submit an £11 million project proposal to the national Innovation Resilience Programme. If successful, the local proposal, 'Working with Natural Gloucestershire' will see a £1.4 million investment into natural flood management and upper-catchment land management projects over the next six years.

Despite the need for improvement as listed above, two key positive messages arose from the December flooding. Firstly that the significant investment made over recent years has had a noticeable benefit. Whilst the event was severe, the potential impacts were to a certain extent reduced. Investment covering flood alleviation schemes, property level flood resilience measures, a robust approach to managing flood risk in new developments, public awareness raising and an enhanced highway drainage maintenance schedule have all added to the protection of homes and businesses and the overall resilience of the county. That said, there is always more that can be done, and these improvements will continue as long as the funding commitment is maintained. Secondly that all RMAs worked as a highly effective extended flood risk management team; both in the immediate response to the event, and also with regard to post event investigation and assessment, with very few shortfalls or gaps. This solid partnership will continue to work together to increase the resilience of the county and to respond to future flooding events.

Moving forward - Next steps:

Climate change and the short, intense, diverse rainfall events that it leads to present a challenge to the county's readiness and resilience. Responding to this the LLFA will continue to work with all of its partners to put in place a range of short and longer-term actions in line with a robust priority schedule and the statutory Local Flood Risk Management Strategy. Due to the scale of the event, local expectations must however continue to be managed. Initial actions include, but are by no means restricted to:

- Update resource priority schedule inline with recent data;
- Promote further public use of the FORT to inform the priority schedule, and wider distribution of the flood guide;
- Carry out location-based higher level Flood Risk Assessments for the worst-hit areas, where such evidence is either lacking or out of date;
- Facilitate information-sharing with local communities to maximise local involvement and to keep residents and businesses informed of progress;

- Immediate actions in worst-hit areas, including maintenance and improvement of existing flood alleviation schemes and warning systems;
- Investigate provision of recovery / resilience householder / business grants, either with central Government support or potentially on a local basis;
- Investigation into strengthening the District Council officers' roles, accessing funding where required;
- Pursue the Innovation Resilience Programme application to full business case and project roll-out; and
- Develop a longer-term action plan, based on an updated priority schedule, and in line with a full revision of the Local Flood Risk Management Strategy.

Gloucestershire Fire and Rescue Service

Operational response:

GFRS found ourselves in spate conditions which put staff in the Control Room under significant pressure. We established recall to duty for the Control Station Manager and dispatched a Group Manager to Waterwells to support the mobilising of appliances. Three Flexi Station Managers were dispatched to various locations across the county to assess flooding impact and report back. There were some issues regarding vehicular access to risk areas, lone working and lack of welfare (most were driving through significant flood areas for around 6 hours). We also saw issues regarding flat batteries in Airwave radios and mobile telephones due to lack of charging leads in temporary cars. The FRS operational elements have been fed back through our Operational Debrief and Monitoring system.

Resources:

From a resourcing perspective we had high activity and had to prioritise sending resources to where it was thought there was potential risk to life. This meant that many calls did not receive a response for several hours as they were not considered an urgent priority for GFRS due to no life risk. We reacted to information received from 999 calls and partner agency information to decide where our resources were needed most. Information received from the multi-agency Operation Link calls was shared internally by both the On Call Area Manager and Civil Protection Team. Overall, the On Call Area Manager overseeing GFRS response felt that, from a GFRS perspective, we managed well considering the limited resources in the Control Room and the spate conditions.

Lessons learnt:

GFRS recognised that an earlier "heads up" from the Control Room to the Flexi Duty Group would have been beneficial in starting to think about wider impacts and perhaps setting up Operation Link for multi-agency meetings, earlier than we did. From a resourcing perspective we managed limited resources in a timely and efficient manner and the prioritisation put in place ensured we reached those most in need as early as possible.

Civil Protection Team

Throughout the Christmas and New Year period (23rd – 31st December 2020) the County Council's Civil Protection Team (CPT) was involved in supporting the multi-agency response to the impacts of flooding and 'Storm Bella'.

CPT response:

During the evening of the 23rd CPT notified GCC Highways, GCC Communications Team and all District Councils that 'Operation Link' had been activated to convene a multi-agency meeting in response to the significant surface water flooding. CPT representatives attended the three meetings that were held over 23rd-24th December 2020 and, following the meetings, provided a 'Common Information Picture' to key GCC staff involved in emergency response and all Directors. The Head of Democratic Services also forwarded these updates to all GCC elected Members.

During the evening of the 23rd CPT liaised closely with Tewkesbury Borough Council and GFRS regarding deployment of the High Volume Pump to Tirley and also placed Gloucestershire Emergency Support Team (a volunteer scheme overseen by CPT) on standby should any of the District Councils have required support with Rest Centres.

Evacuation of vulnerable residents:

During the period CPT was also involved in liaising with Tewkesbury Borough Council and GFRS to coordinate the evacuation of two vulnerable residents by boat. This included the evacuation, on Christmas Day, of a lady from Tirley whose home had flooded and was taken to a hotel and a lady from Sandhurst who required urgent hospital treatment.

Other response support:

CPT Duty Officer (24/7) also liaised with relevant partners to respond to a number of queries that came in via the Duty Officer phone during this period. This included liaising with:

- GCC Asset and Management Service, Stroud District Council and GFRS regarding the potential overtopping of the Thames and Severn Canal at Chalford.
- Cotswold District Council regarding sewer flooding in Siddington, Cirencester.
- GCC Health Protection and the EA to provide advice on river levels to Tewkesbury Fields Care Home, where a number of residents supported by GCC Adult Social Care live.
- Police, following a request from Tewkesbury Borough Council, regarding motorists ignoring road closure signs in Sandhurst and getting stuck or causing bow waves.
- GCC Adult Social Care and Cotswold District Council to provide information on vulnerable people potentially affected by flooding in Cirencester.

Contact arrangements:

Previously, elected Members have been provided with a contact number for GFRS Control to report any (non 999) issues affecting communities during an emergency. This was on the

understanding that Control would then liaise with CPT Duty Officer or GFRS Officers as appropriate to follow up any such concerns.

However, during the evening of the 23rd GFRS Control were dealing with a huge volume of calls and it is recognised that, unfortunately, some elected Members were unable to make contact via this route. As such, GFRS Assistant Chief Fire Officer, CPT Leader and Head of Democratic Services have since met and agreed that elected Members can contact the on call Principal GFRS Officer (currently also GCC Gold Officer) during emergencies with any particular concerns.

This will ensure that Members are able to make direct contact with a GFRS Principal Officer and free up the CPT Duty Officer number for the emergency services, other GCC Teams, District Councils and partners to make contact on operational issues. Information to this effect including a flow chart, contact numbers and additional useful contact numbers and websites have been placed on the Members' area of the GCC website.

Debriefs:

Following the December flooding, CPT has also attended the flooding debriefs with District Councils, arranged and facilitated by GCC Flood Risk Team. Members of CPT have also submitted feedback to the online Local Resilience Forum (LRF) Flood Debrief.

Awareness session:

CPT had previously offered elected Members awareness training on GCC and wider multi-agency emergency response. CPT is planning to provide awareness refresher sessions for elected Members going forward. This forms part of the overall longer term project the team is undertaking to build on the County Council's arrangements and preparedness for emergencies and effectively meeting the Council's statutory responsibilities under the Civil Contingencies Act 2004.

Additional response to January / February 2021 flooding:

CPT and GFRS have since also been involved in supporting the multi-agency response to the recent flooding, in light of further heavy rainfall impacting on already saturated ground and elevated river levels. This has included re-deploying the High Volume Pump to Tirley, liaising with relevant partners, notifying partners and attending EA Flood Advisory Service teleconferences, monitoring relevant websites and providing weather and flooding updates to GCC staff involved with emergency response, which again the Head of Democratic Services has been forwarding to elected Members for information.

Gloucestershire Highways

The issue of highway flooding can generally be split into two categories. The first relates to flash flooding as a result of storm events and the second to flooding associated with high river levels. However, as flooding associated with main rivers tends to be more predictable as we usually receive advance notice from partner agencies such as the EA, the following

relates to GCC Highways' response to the more reactive and less predictable impact of flash flooding.

Recent events:

This winter, the Gloucestershire highways network experienced a number of storm related weather events that have resulted in heavy rain over an intense period with the most notable being on 23rd December 2020 and 20th January 2021. The December event resulted in wide spread flash flooding on the highway across the entire county resulting in hundreds of issues being reported to us from members of the public and the emergency services. Prior to the forecast heavy rain, we deployed crews to known areas at risk from flooding to ensure that gully gratings and trash screens were cleared, however the intensity of the rain meant that we also experienced issues in areas not normally affected. Storms with rainfall this intense deliver such a large amount of water in such a short period of time that it overwhelmed some of our drainage systems, and whilst in some cases this was caused by pipes and gully gratings becoming blocked, other key wider assets were also being overwhelmed such as ditches, watercourses and combined sewer systems. In these instances flooding can occur, not because the drainage system is blocked or faulty, but because the outfall of the system has become submerged, slowing the flow of water. In some cases the water level in a ditch or watercourse also exceeds the road level rendering the drainage system ineffective.

In urban areas, flooding is often caused as a result of gully gratings becoming blocked by leaves and other detritus. This is a particular problem where demand for on street car parking is high, which means it can be difficult for our crews to routinely cleanse the drainage systems. Our colleagues in the District Councils also often struggle to sweep the streets to remove debris which can then go on to block the drainage system. On 23rd December GCC Highways received such a volume of calls both to the in hours and out of hours contact centres, it was difficult deploy resources effectively, which meant we were still dealing with issues over the entire Christmas period and beyond. As a result, we suspended all planned drainage cleansing work at the start of January and redirected resources to flood clear up and remedial activities to allow us to empty gullies and use high pressure jetting to clear blockages in the drainage system. An additional 37 days of reactive jetting resource was used across the county in January as part of the response.

Working practices:

Following the December storm event we undertook a review and established a new approach to dealing with storms to ensure that resources were deployed in the most effective way for future events, the first of which occurred on 20th January in the form of storm Christophe. As part of the new approach, we set up Flood Desks in each of our four operational areas, which were manned by members of the GCC area teams. Calls continued to be taken by the Highway Customer Service Team centrally, however before emergency jobs were raised and passed to the contractor for scheduling, they were triaged by the flood desk. In addition to the flood desk staff, all available GCC area team staff were out on the network and were directed to trouble spots by the flood desk to make an assessment to

ensure that the correct response was arranged and to establish the required priority of each incident.

This approach allowed the management of an active list of incidents and the subsequent deployment of the right resource, to the right place in the correct priority order. This process, combined with the suspension of all planned work by works gangs and our jetting fleet, meant that we were able to resolve more issues on the first visit and freed up our resources to allow us to tackle the greatest risk, largest impact and highest profile problems above more minor issues and allowed us to deploy the right resource to the right job.

Key routes:

A number of roads and key transport routes were closed as a result of the flooding. Some of these are outside of the direct control of Gloucestershire Highways, but every effort was made to reopen routes as quickly and as safely possible. Where routes remained closed, signage was deployed to ensure public safety and reduce the flooding impact of car bow-waves entering neighbouring properties when motorists attempt to drive through flood waters.

One such key route which is often subject to flooding is the A417 near Maisemore. These closures present a persistent challenge for people in the local area and those using it as a regular access route into and out of Gloucester, with resulting significant detours and traffic congestion. The issue has, however, been recognised by GCC. In 2015, we bid for a Department for Transport (DfT) fund towards a £25M scheme to address the issue. The bid was unfortunately unsuccessful and the escalating cost of the scheme is beyond what GCC would be able to directly fund from existing budgets. More recently, however, fixing this problem has been identified as a key issue in the emerging review of the Local Transport Plan (LTP) and GCC are continuing to seek funding to do so as climate change will only increase the frequency of closures such as these.

Schedule enhancements:

Whilst Storm Christophe did not bring the rainfall we saw in December, it was a great opportunity to test our new process, and whilst there were still learning points to be had, the whole process delivered significant improvements in response and subsequent network recovery time. In addition to the flood desk approach, we are also reviewing the flood locations from December and January as part of an exercise to determine if adjustments need to be made the gully cleansing frequency in the worst affected areas. We also continue to work with the District Councils on joint authority area deep cleans in busy urban areas where residents are contacted to move cars from a street so that we can undertake collaborative works with minimal disruption to residents in locations where street cleansing and gully emptying is otherwise problematic. We have also increased the number of deep cleans undertaken this year and are planning to develop a schedule for further joint operations in the coming financial year.

Conclusion

The flooding associated with the high rainfall event of December 23rd / 24th was some of the worst that Gloucestershire has seen since 2007. The impacts were ameliorated by the work undertaken in the intervening period however, and response to the event was well coordinated and effective as a result of a solid multi-agency partnership. Some clear lessons have been learnt in the immediate aftermath, positive coordinated action on which will lead to improved readiness for, and resilience to, similar future events.

February 2021.

Appendix 1:

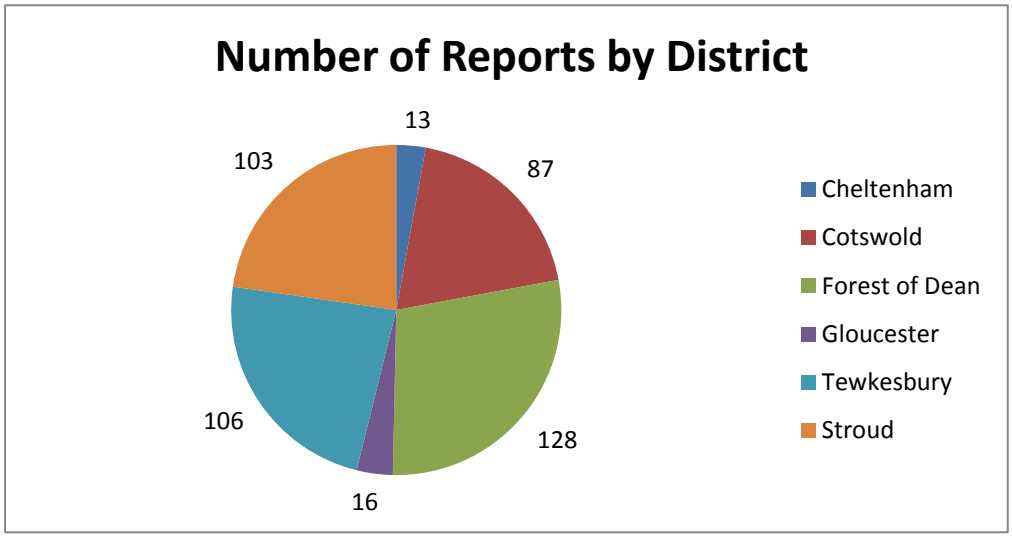
Gloucestershire property flooding reports summary

The following information has been derived from a number of sources, including District Council officer investigations, LLFA investigations and FORT. A source database is used to inform these summaries, but is not included here due to data GDPR restrictions. The database does however include information used to inform targeting of resources, such as source of flooding, which can be useful to other partners, so a condensed GDPR-compliant copy is available on request. Additional data is continually added to the database as further reports are received relating to the December event, but the summaries below are correct as of 9th March 2021. Report distribution maps are included at Appendix 4.

Flood reports by District:

District	Number of reports*
Cheltenham	13
Cotswold	87
Forest of Dean	128
Gloucester	16
Tewkesbury	106
Stroud	103
Total	**453**

*Numbers subject to change



Flood reports by type:

Type of Flooding	Number of Reports
Properties Flooded (Internal Flooding)	306
Properties Affected (External flooding)	139
Unknown	8
Grand Total	**453**

Property Type	Number of Reports
Residential	397
Commercial	55
School	1
Grand Total	**453**

District	Property Type	Number of Reports	Internal or External Flooding	Number of Reports
Cheltenham	Residential	11	Internal	1
			External	10
			Unknown	0
	Commercial	1	Internal	1
			External	0
			Unknown	0
	School	1	Internal	1
			External	0
			Unknown	0
Cotswold	Residential	82	Internal	67
			External	14
			Unknown	1
	Commercial	5	Internal	5
			External	0
			Unknown	0
Forest of Dean	Residential	107	Internal	99
			External	8
			Unknown	0
	Commercial	21	Internal	20
			External	1
			Unknown	0
Gloucester	Residential	15	Internal	3
			External	12
			Unknown	0
	Commercial	1	Internal	0
			External	1
			Unknown	0
Stroud	Residential	94	Internal	40
			External	51
			Unknown	3
	Commercial	9	Internal	6
			External	2
			Unknown	1
Tewkesbury	Residential	88	Internal	47
			External	38
			Unknown	3
	Commercial	18	Internal	16
			External	2
			Unknown	0

Parishes with 5+ internal property reports:

District	Parish	Number of Reports
Cheltenham	N/A	N/A
Cotswold	Bledington	24
	Cirencester	19
	Lower Slaughter	6
	Moreton-in-Marsh	5
Forest of Dean	Cinderford	10
	Drybrook	5
	Longhope	12
	Lydney	31
	Newent	15
	Rudford and Highleadon	13
Gloucester	N/A	N/A
Tewkesbury	Ashchurch Rural	7
	Gretton	7
	Tirley	12
	Winchcombe	12
Stroud	Brimscombe and Thrupp	12
	Stroud	14

Parishes with 5+ reports (internal and external) or most affected parish if less than 5:

District	Parish	Number of Reports
Cheltenham	Charlton Kings	3
	Lansdown Ward	3
Cotswold	Bledington	25
	Cirencester	20
	Lower Slaughter	12
	Moreton-in-Marsh	8
Forest of Dean	Cinderford	11
	Drybrook	5
	Longhope	14
	Lydney	31
	Newent	16
	Rudford and Highleadon	13
Gloucester	Abbeydale Ward	4
Tewkesbury	Ashchurch Rural	7
	Gretton	28
	Stoke Orchard	5
	Tewkesbury	8
	Tirley	12
	Winchcombe	13
	Woodmancote	6
	Longford	5
Stroud	Brimscombe and Thrupp	13
	Hamfallow	9
	Painswick	13
	Standish	7
	Stonehouse	8
	Stroud	16
	Upton St Leonards	13

Appendix 2:

Rainfall and river level summary

Table 1 shows the rainfall for 23rd December 2020 at various locations across the county and Table 2 shows the peak each river level gauge peaked at, on which date and time, and whether this was its highest level. It should be noted when looking at this table that many of the river level gauges were installed after the 2007 flood event so didn't record this event.

The areas with the highest rainfall appear to be Parkend (near Lydney), Bourton-on-the Water and Dowdeswell (near Cheltenham), which all recorded greater than 50mm over the course of the day. Followed by Newent, Stroud, mid-Cotswolds and areas in Tewkesbury Borough, which all saw rainfall in excess of 40mm. Rainfall in the south of the county seems to have been either less intense or for a shorter period as totals only reached around 20mm.

Table 1 - Rainfall totals for 23rd December 2020:

District	Location	Rainfall Total (mm)
Cheltenham	Dowdeswell (near Cheltenham)	53.4
Stroud	Ebworth (near Painswick)	47.8
	Miserden (near Stroud)	44.4
	Minchinhampton (near Nailsworth)	19
	Kingswood	19.4
Gloucester	Over Farm (near Gloucester)	8
Forest of Dean	Parkend (near Lydney)	56.8
	Taynton (near Newent)	47.8
Cotswold	Broadway	36.4
	Chipping Campden	30.2
	Bourton on the Water	56.1
	Stowell Park (near Northleach)	22.4
	Rapsgate (near Rendcomb)	42
	Shorncote (near South Cerney)	20.3
	Tetbury	20.8
Tewkesbury*	Tewkesbury	45
	Winchcombe	43
	Bishop's Cleeve	45
	Churchdown	30

* There are no rain gauges in Tewkesbury Borough so these values have been estimated using radar data

This rainfall translated into many watercourses across the county rising swiftly and significantly, many nearing their highest recorded level and in some instances exceeding it. It should be noted that many river gauges were installed after 2007 so the recorded levels here will not include the July 2007 flood event.

Table 2 - River Levels:

District	River	Location	Peak (m)	Date and Time of Peak	Record Peak (m)	Record Peak Exceeded?*
Cheltenham	Chelt	Charlton Kings	1.550	23/12/2020 18:00	2.657	No
		Cox's Flume	1.514	23/12/2020 17:14	2.167	No
		College Road	1.521	23/12/2020 19:09	1.442	Yes
		Arle	2.143	23/12/2020 18:28	2.976	No
	Wymans Brook	Prestbury Road	0.323	23/12/2020 18:00	0.320	Yes
		Windyridge Road	1.522	23/12/2020 18:02	1.338	Yes
	Lilley Brook	Moorend Road	1.112	23/12/2020 17:00	1.737	No
	Hatherley Brook	Merestones Road	1.524	23/12/2020 17:30	2.750	No
Cotswold	Evenlode	Moreton	1.492	23/12/2020 21:15	1.461	Yes
		Evenlode Bridge	2.350	23/12/2020 23:45	2.800	No
	Windrush	Bourton Windrush	0.352	24/12/2020 14:00	0.597	No
	Coln	Fosse Bridge	0.346	26/12/2020 22:45	0.420	No
		Bibury	0.462	27/12/2020 12:00	0.524	No
	Churn	Cirencester	0.837	27/12/2020 06:15	1.040	No
		South Cerney	1.401	27/12/2020 09:30	1.470	No
		Cerney Wick	0.711	27/12/2020 14:30	0.682	Yes
	Ampney Brook	Ampney St Peter	0.760	27/12/2020 06:00	1.230	No
	Thames	Ewen	0.945	27/12/2020 05:15	1.166	No
		Somerford Keynes	1.565	27/12/2020 12:00	1.470	Yes
Forest	Wye	Lydbrook	5.417	21/12/2020 03:15	7.551	No
	Lyd	Parkend	1.347	23/12/2020 22:38	1.268	Yes
		Lydney	1.419	24/12/2020 00:48	1.343	Yes
	River Leadon	Wedderburn Bridge	3.210	24/12/2020 03:00	3.799	No
Gloucester	Horsbere Brook	Clomoney Way	2.092	23/12/2020 17:44	2.043	Yes
	Wotton Brook	Kingcroft Road	1.804	23/12/2020 18:30	1.727	Yes
		Armscroft Place	1.197	23/12/2020 20:45	1.194	Yes
	Twyver	Abbeymead Avenue	1.287	23/12/2020 18:30	1.289	No
		Saintbridge	4.517	23/12/2020 20:45	4.500	Yes
		India Road	0.444	23/12/2020 15:15	0.717	No
	Sud	Cheyney Close	1.975	23/12/2020 21:15	1.072	Yes
		Matson Place	0.900	24/12/2020 03:15	1.040	No
	Whaddon Brook	Shepherd Road	1.226	23/12/2020 18:15	1.030	Yes
	Daniels Brook	Bodiam Avenue	2.481**	23/12/2020 18:59	1.110	Yes
	Dimore Brook	Field Court Drive	0.815	23/12/2020 21:45	0.934	No
		The Causeway	1.925	23/12/2020 22:30	2.286	No
	Severn	Gloucester	3.982	28/12/2020 23:15	4.919	No
Stroud	Frome (MI)	Chalford	0.626	24/12/2020 21:12	0.760	No

		Eastington	2.026	24/12/2020 02:43	2.211	No
	River Frome	Egypt Mill (Nailsworth)	0.608	27/12/2020 04:48	0.638	No
		Ebley Mill	1.198	23/12/2020 20:59	1.396	No
	Slad Brook	Slad Road	1.869	23/12/2020 21:02	1.175	Yes
		Merrywalks	1.319	23/12/2020 21:30	1.107	Yes
	River Cam	Cam	1.947	23/12/2020 19:00	2.651	No
		Cambridge	1.017	23/12/2020 19:57	1.375	No
Tewkesbury	Severn	Mythe Bridge	4.325	25/12/2020 11:04	5.498	No
		Deerhurst Flow	5.368	25/12/2020 23:45	6.382	No
		Haw Bridge	5.208	26/12/2020 05:14	6.228	No
		Ashleworth	4.837	26/12/2020 11:15	6.029	No
		Sandhurst	4.390	27/12/2020 09:18	5.376	No
	Hatherley Brook	Sandhurst	4.374	27/12/2020 12:30	5.350	No
	Leigh Brook	Leigh Court	3.219	26/12/2020 05:30	4.236	No
	River Isbourne	Toddington	1.339	23/12/2020 20:30	1.744	No
	River Avon	Upper Pound	4.407	25/12/2020 14:49	5.491	No

*Many gauges were installed after 2007 so this event isn't accounted for in the record peak
**This looks too high and may be an error

In Cheltenham, the notable river levels include the Wymans Brook in Cheltenham, which saw its highest level at around 18:00 on the 23rd. The previous highest at Prestbury Road was in August 2014 and at Windyridge Road in November 2019. The river Evenlode in Moreton-in-Marsh in the Cotswolds, reached its peak at 21:15 on 23rd and was its highest level recorded, exceeding the previous peak from November 2012. The lower reaches of the Churn and the upper reaches of the Thames peaked later, on 27th December. The Churn at Cerney Wick exceeded its peak recorded in November 1990 and the gauge for the Thames at Somerford Keynes exceeded its highest recorded level from December 2012.

In the Forest of Dean, the Lyd at Parkend and Lydney reached the highest peak, which was previously recorded on November 2012 and February 2020 respectively. River levels peaked at approximately 22:38 on 23rd at Parkend and 00:48 on 24th at Lydney. The Slad Brook in Stroud reached its highest recorded level at Slad Road and Merrywalks, which was previously from December 2013. It reached its peak around 21:00 on 23rd.

Finally, in Gloucester, a number of rivers reached their highest levels, a reflection of the rainfall levels in their headwaters rather than in the City itself. They include the Horsbere Brook at Clomoney Way (previous peak in July 2012), the Twyver at Saintbridge Balancing Pond (previous highest recorded in November 2012), and Whaddon Brook at Shepherd Road (previous highest peak from June 2016). River levels peaked between 18:00 and 21:00 on 23rd.

Return Period:

The return period for a rainfall or flood event is a way of calculating the likelihood, and therefore the size, of the event. The underlying principle is that the larger the storm, the less likely it is and therefore the less frequently it will be seen. The return period can be written in two ways; 1 in x years or x% AEP (Annual Exceedance Probability). They mean the same thing so a 1 in 100 year storm will have a 1% chance of happening each year (AEP).

According to the radar data in Meniscus Map Rain (not the rain gauges, which in some cases exceeded the radar rainfall), the return period for the event was relatively low at less than 1 in 5 years (20% AEP) for most areas. The return period at Tewkesbury was 1 in 8 years (12.5% AEP) and 1 in 7 years (14% AEP) for Bishop's Cleeve.

Rainfall for December 2020 and preceding months:

The impact of the rainfall appeared to be worse than what should be expected from the size of the storm according to the return periods. It is likely therefore that the preceding wet weather made the ground saturated so when it rained on the 23rd surface water developed rapidly and the levels of watercourses and rivers rose quickly.

Table 3 shows the rainfall totals for December for various locations across the county. When compared to Table 4, which shows the average rainfall totals for December for 3 locations in or near Gloucestershire, it can be seen that, in addition to the high rainfall on 23rd, December was well above average. Notable totals include Dowdeswell (near Cheltenham), Parkend (near Lydney) and Taynton (near Newent).

Table 2 - Rainfall totals for December 2020:

District	Location	Rainfall Total (mm)
Cheltenham	Dowdeswell (near Cheltenham)	356.6
Stroud	Ebworth (near Painswick)	181.2
	Minchinhampton (near Nailsworth)	160.2
	Miserden (near Stroud)	190.6
Gloucester	Over Farm (near Gloucester)	106
Forest of Dean	Parkend (near Lydney)	272.6
	Taynton (near Newent)	211.6
Cotswolds*	Chipping Campden	130
	Bourton on the Water	125
	Naunton	125
	Cirencester	130
	South Cerney	110
	Fairford	100
Tewkesbury**	Tewkesbury	140
	Winchcombe	150
	Bishop's Cleeve	200
	Churchdown	115

* This information for the rain gauges in the Cotswolds is not yet available so these are estimates based on radar data ** There are no rain gauges in Tewkesbury Borough so these values are estimates based on radar data

Table 3 - 1981-2010 average rainfall totals for December*:

Climate Station	Rainfall Total (mm)
Cheltenham	80.8
Cirencester	82.8
Ross-on-Wye	74.7

*https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcnx0z9e5

As well as December 2020 being a wetter than average month, October 2020 totals were also above average (in some cases by a similar degree as December totals) and, although November 2020 was generally below average, this amount of rainfall would have led to high levels of saturation of the ground.

Rainfall data in this summary was taken from EA rain gauges unless otherwise specified. River Levels were provided by the EA and, where not available, were taken from Gauge Map website (www.gaugemap.co.uk).

Appendix 3:

Flooding emergency contact list

As mentioned in the main document, the following document was approved by all listed partners. It is designed to work alongside the LLFA flood guide, and not as a replacement.

FLOODING EMERGENCY CONTACT LIST

Is a property imminently at risk of flooding internally and/ or likely to require evacuating due to flooding? Call Gloucestershire Fire and Rescue Service – 999

Is Main River flooding putting a property at imminent risk of flooding?

- Telephone: 0800 80 70 60 (Environment Agency incident hotline)

Is highway flooding putting a property at imminent risk of flooding?

- Telephone: 08000 514 514 (Gloucestershire Highways emergency line)

Is a sewer or water main putting a property at imminent risk of flooding?

- Severn Trent Water - 0800 783 4444 (emergency line)
- Thames Water - 0800 714 614 (emergency line)
- Wessex Water 0345 850 5959 (emergency line)
- Welsh Water - 0800 085 3968 (emergency line)

To report recent flooding events, use Gloucestershire County Council's Flood Online Reporting tool

To report highway drainage issues that aren't putting a property at imminent risk of flooding: Report It

District councils have local flood response plans and can be contacted regarding local flooding issues (links lead to flooding information pages):

- Cheltenham Borough Council - 01242 26 26 26
- Cotswold District Council - 01285 623 000
- Forest of Dean District Council - 01594 810 000
- Gloucester City Council - 01452 396 396
- Stroud District Council - 01453 766 321
- Tewkesbury Borough Council - 01684 295 010

Further information:

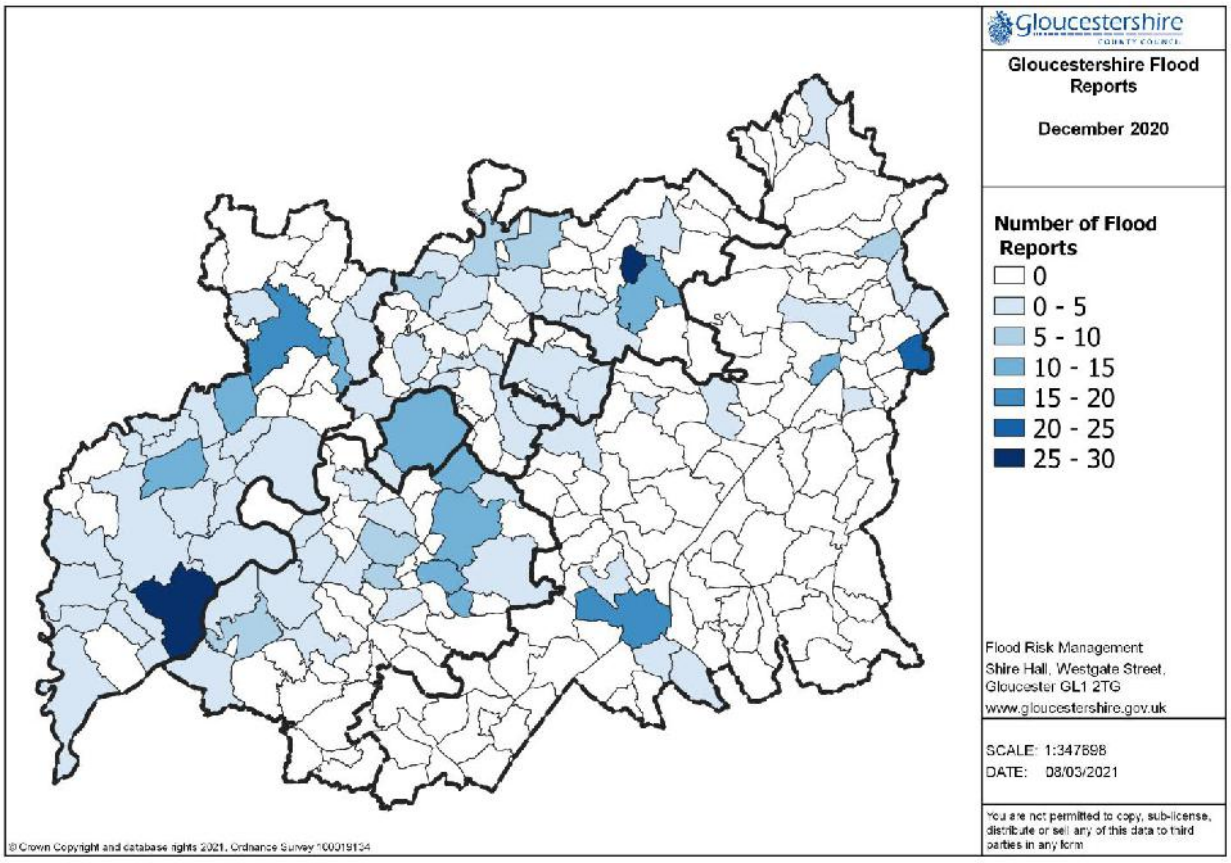
- GCC Essential Flood Guide - one-stop shop for information on how to prepare for, react to and recover from flooding
- EA Flood Warnings or 0345 988 1188
- EA River Levels
- GCC Highways Closed Roads
- Highways England roads
- Lower Severn Internal Drainage Board or 01454 413340

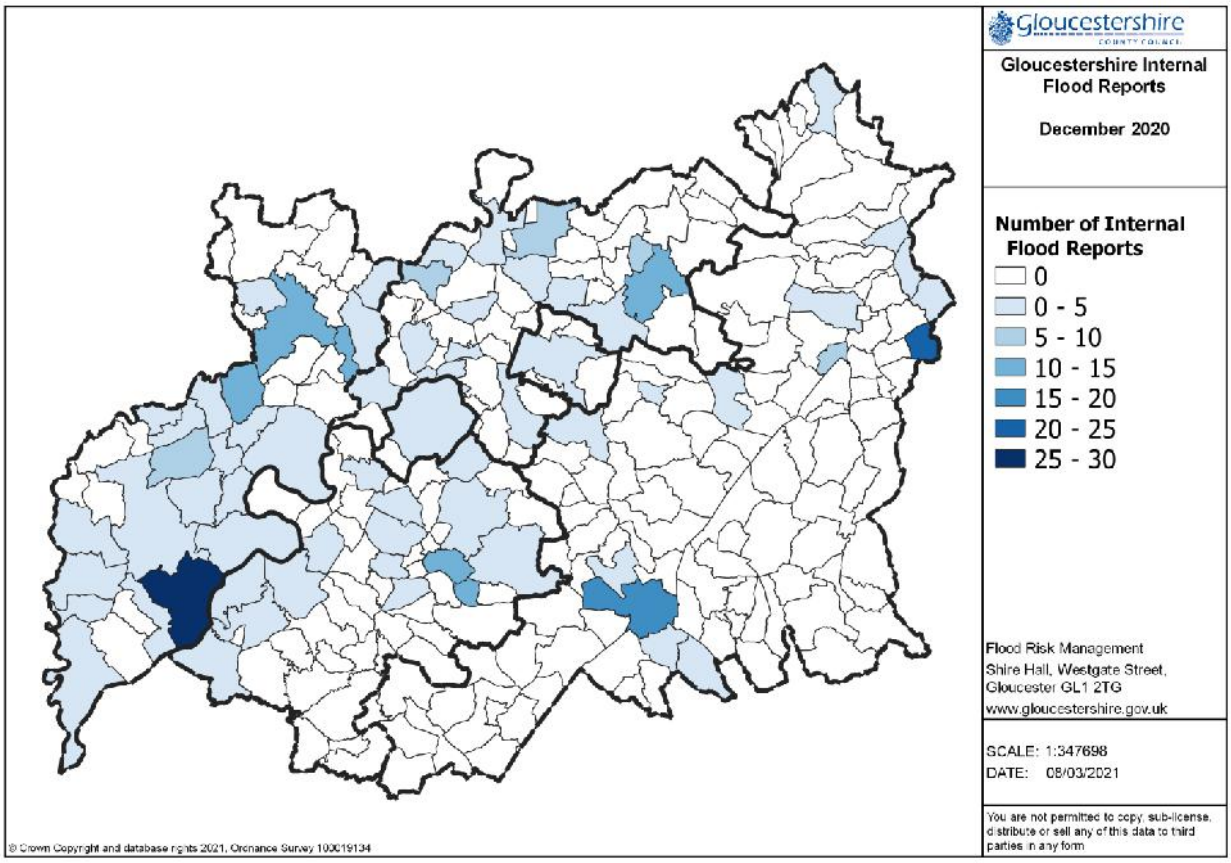
IF YOUR PROPERTY HAS FLOODED INTERNALLY OR IF YOU NEED ASSISTANCE WITH EVACUATION, CALL GLOUCESTERSHIRE FIRE AND RESCUE SERVICE – 999

JANUARY 2021

Appendix 4:

Flood report distribution maps





Appendix 16

Wisloe Action Group Ecology Statement

1.0 Introduction and Qualification

Wisloe Action Group (WAG) was formed in late 2019 to help represent our community's views in response to Stroud District Council's Local Plan public consultation process. This statement has been prepared by WAG. It sets out evidence with respect to the ecological impact for PS37 which has not been properly assessed and highlights that Stroud District Council (SDC) has failed to act upon consultation responses highlighting the presence of protected species in the proposed site and surrounding land. The plan does not comply with Paragraph's 170, 171, 174 and 177 of the NPPF.

2.0 Introduction to PS37

2.1 The Slimbridge Parish lies on the Severn Plain and as such is flat with open views across the Severn Estuary to the Forest of Dean to the East and the Cotswold escarpment to the West. Slimbridge is best known as the home of the Wildfowl and Wetlands Trust's (WWT) Slimbridge Reserve which was founded by Sir Peter Scott in 1946 as a centre for research, education, recreation and conservation. He opened it to the public so that anyone could enjoy getting close to nature. The WWT Slimbridge website *states* [1]*"Sir Peter Scott, had an early and instinctive appreciation of its basic principles of sustainability. He argued that we have a responsibility to future generations to care for the natural environment and that "sooner or later, [mankind] will become much more widely concerned with optimum rather than maximum,* ***quality rather than quantity****" (emphasis added).*

2.2 The Severn Estuary has extensive intertidal mud-flats and sand-flats, rocky platforms and islands. Saltmarsh fringes the coast backed by grazing marsh with freshwater ditches and occasional brackish ditches. The subtidal seabed is rock and gravel with subtidal sandbanks.

2.3 Wildfowl and waders are present on the River Severn in Nationally and Internationally important numbers. They also make extensive use of the estuary's hinterland and environs. This includes surrounding agricultural fields in and around the Slimbridge Parish.

3.0 Biodiversity Designations

3.1 The Severn Estuary and surrounding land is ecologically sensitive and is subject to the following restrictive designations:

Severn Estuary Site of Special Scientific Interest (SSSI)

Upper Severn Estuary Site of Special Scientific Interest (SSSI)

Severn Estuary Special Protection Area (SPA)

Severn Estuary Special Area of Conservation (SAC)

Severn Estuary Ramsar

Severn European Marine Site (EMS)

and Strategic Nature Reserves

3.1.2 The designations are shown in Map 1 of the [2]Habitats Regulations Assessment of the Stroud District Local Plan Review Pre-submission Draft Plan and [3]Figure 3.3. of the Sustainability Appraisal Scoping Report (April 2018).

3.1.3 PS37 is next to a Strategic Nature Area (SNA) shown in [3]Figure 3.3. Sustainability Appraisal states in para 3.51 that *"Strategic Nature Areas (SNAs) have been identified as selected landscape-scale areas of land which show where the characteristic habitats which typify the County can be expanded and linked to protect and enhance biodiversity assets.* ***The Nature Map shows that within Stroud there are important areas for wildlife at the SNAs. These are areas for wet grassland*** *(including areas for traditional orchards) (emphasis added)* ***mostly to the west towards the River Severn and along parts of a number of the other smaller water bodies*** *(including the Berkeley Pill/Little Avon,* ***River Cam*** *and River Frome) as well as areas for woodland mosaic and lowland calcareous (limestone) grassland mostly towards the east and the edge of the Cotswolds AONB."* (emphasis added).

3.1.4 The [3]Sustainability Appraisal para 3.52 mentions that *"In total six Priority Landscapes which contain important ecosystems and ecological networks have been identified. Within Stroud, Severn Vale has been identified as one of these areas recognising it as part of the "wildlife highway" with an overall aim to restore a continuous expanse of* ***lowland wet grassland and other wetland habitats****"* (emphasis added).

3.2 There is an established recreation mitigation approach for the Severn Estuary, which applies a zone of 7.7km around the designation sites. The Conservation of Habitats and Species Regulations 2017 requires SDC to assess the impact of their local plan through a Habitats Regulations Assessment (HRA). The impact is assessed on the internationally important sites for biodiversity in and around the Stroud district. The HRA assesses designated sites (such as SPA, SAC and Ramsar) which are referred to as European sites. These are the foundation of UK nature conservation policies. Each of these shapes a national network of sites that have the highest protection in domestic policy and law. Any new residential development is likely to contribute to a significant effect. The assessments focus on the increased use of European Sites and functionally-linked land) for recreation such as walking, as a consequence of an increased number of people. The HRA also considers the urban effects (cat predation, light pollution etc), loss of supporting habitat and air quality issues. The HRA mentions in particular mobile species such as birds but ecological assessments have not been undertaken for PS37.

3.3 Evidence has been presented to SDC through consultation responses (since January 2020) and sightings recorded of Protected Species (Appendix 1). Protected species were also raised at the SDC Environment Committee meeting in April 2021. Given the importance of the European Site's Functionally-Linked land, it is unclear why SDC did not refer this to Natural England to undertaken an ecological assessment, when two other sites in the Berkeley Cluster have been subject to a high level of appraisal and scrutiny. PS37 should be identified as functionally linked land to the SPA within the HRA of the Local Plan. It is currently not identified within the HRA Report dated May 2021.

3.4 The SNA incorporates the River Cam in Cambridge, which flows the boundary with PS37 to the North. Ground water run-off from PS37 (or pumping water into the River Cam from PS37) would have a negative impact. Given the importance of the SNA, it is unclear why SDC did not refer this to Natural England to undertaken an ecological assessment. It is currently not identified within the HRA report dated May 2021. No assessment of the impacts to the SNA or the River Cam has been undertaken by SDC to understand the effect.

3.5 The Pre-Submission Local Plan includes "on site and, if appropriate, off site work to mitigate against the identified impacts of development upon the Severn Estuary SAC/SPA/Ramsar site". The [4]Sustainability Appraisal Report for the Stroud District Local Plan Review – Pre-submission Draft Local Plan does not explain what the potential effects of this site could be on the Severn Estuary. It simply states that it is within 7.7km of the European Site.

4.0 Protected and Threatened Species

4.1 Eurasian Curlews

4.1.1 The Curlew Recovery Partnership (CRP) brings together organisations who have an interest in Curlew conservation to help secure one of England's most iconic and threatened species. The CRP receives financial support from Defra. The WWT is one of nine organisations on the CRP steering group. CRP's website states [5]*"The Curlew is arguably the most pressing bird conservation priority in the UK, where nearly half the breeding population has been lost over the last 25 years and where range contraction has seen Curlews disappear from many traditional sites".*

4.1.2 In a recent [6]BBC article (March 2021), Dr Hilton of the WWT said [curlew] *"numbers were steadily disappearing in the south, with a 'few hundred' pairs left, estimating there were about **35 in the Severn Vale*** (emphasis added). Documentary evidence is provided in this statement (Appendix 1) confirming in the region of 30+ Eurasian Curlews regularly use PS37 and hinterland for refuge roosting and feeding each year. Dr Hilton also stated that *"the **main reasons for the decline in numbers was the loss of habitat** and the large number of predators in the UK*" (emphasis added).

4.1.3 Members of CRP are aware of the presence of Eurasian Curlews and are engaged in discussions with WAG regarding this Functionally Linked land.

4.1.4 With respect to Eurasian Curlew recovery, the [7]WWT website states *"In the Severn and Avon Vale where the birds are struggling to safely rear young, we're working to find solutions to adapt to the birds' needs. **We are supporting farmers to protect the curlews that use their land***"(emphasis added). WAG are aware that the WWT have undertaken Curlew surveys on other Ernest Cook Trust (one of the promoters) land near PS37.

4.1.5 Sightings of Eurasian Curlews have been registered with the Gloucestershire Bird Recorder and the Gloucestershire Centre for Environmental Records (GCER) on the PS37 strategic allocation site itself and on land adjacent to the A38 to the south west of the PS37 site. Curlew are classified in the UK as Red under the Birds of Conservation Concern 4: the Red List for Birds (2015), Priority Species under the UK Post-2010 Biodiversity Framework and listed as Near Threatened on the global IUCN Red List of Threatened Species. Curlew are identified as interest feature 7 of the Severn Estuary Special Protection Area (SPA) as part of the internationally important assemblage of waterfowl, meaning that the open agricultural land of PS37 and the surrounding area are both important for curlew and provide supporting habitat for the Severn Estuary SPA. PS37 should therefore be identified as functionally linked land to the SPA within the HRA of the Local Plan. It is currently not identified within the HRA Report dated May 2021.

4.2 European Eel

4.2.1. The European Eel is listed as a critically endangered species on the global IUCN Red List of Threatened Species. It is also a priority species under the UK Post-2010 Biodiversity Framework. In 2014 at the cost of £300k, the Environment Agency completed work on two weirs on the River Cam. This opened up several kilometres of the River Cam to encourage eels (& other fish) to migrate for the first time since the early 1980's. It appears a study has not been considered or undertaken to assess the potential impacts on the River Cam from PS37 (disturbance, promoters drainage solution or ground water).

4.2.2. The Natural England response to the Regulation 18 consultation states in para 12.3 (with reference to another allocation) *"Re - Functionally linked land…….With regard to the* ***SAC and Ramsar Site it should be noted that these designations include a suite of migratory fish which spend a part of their life cycle in the watercourses of the Severn hydrological catchment****. As a result the River Severn and its tributaries (including tributaries flowing directly into the wider estuary such as the R.Frome) constitute* ***'functionally linked watercourses'****"*. (emphasis added). There is evidence therefore to suggest that the River Cam constitutes a Functionally Linked Watercourse.

5.0 Promoters Ecology Reports

5.1 In 2019, the promoters of PS37 commissioned All Ecology Ltd to produce appraisal reports. A survey took place at the end of August 2019. Other protected species have been identified in the reports including; bats, water voles, dormice, birds, badgers and other mammals, invertebrates and newts. Further assessments are recommended by [7]All Ecology Ltd. The promoters have not undertaken any assessment since these reports were produced in September 2019.

5.2 The [7]promoters report recommends, *"The scale of the potential proposals for the site would* ***significantly alter the character of the site*** *(emphasis added),* ***resulting in the loss of fields*** *(emphasis added) as well impacts on hedgerows and trees. The* ***proximity of the site to the Slimbridge Wetland Centre and the Severn Estuary, the farmland character of the site, and the large size of the site would mean that any development of the site would need to be supported by a full assessment of the site to establish its value for various birds. Therefore, it is likely that wintering/migrant bird surveys would be needed as well as farmland/breeding bird surveys*** *(emphasis added) in order to inform a suitable mitigation strategy."* The promoters have not undertaken any assessment since these reports were produced in September 2019.

5.3 The European otter is also present on the River Cam with sightings recorded with GCER in the past year. The [7]promoters ecology report state *"….the River Cam runs adjacent to the north boundary of the site which is upstream of the River Cam (part of unit 5). Maintaining the integrity of this river corridor would be an important consideration in any landscape scheme and retaining, possibly extending the woodland buffer could form the basis of this. Provision will also need to be made to* ***address the long-term potential impacts to this river by providing sufficient measures to ensure that the hydrology of the site is not changed to the detriment of the river*** *and that potential pollutants from new residents (detergents, nutrient enrichment etc.) can be avoided"*.(emphasis added)
The promoters have not undertaken further assessments since the reports were produced in September 2019.

6.0 Water Issues

6.1 The [8]Infrastructure Delivery Plan (IDP) states "…..*allocations will add foul flows to wastewater networks that are already constrained in places. For some allocations, existing capacity is not available and providing new capacity will involve Environment Agency consent review and/or construction outside of the existing STW boundary. Both Severn Trent and Wessex Water have highlighted the sites that they think have the highest risks, where upgrades to local pumping stations and sewage treatment works are likely required to support the sites….."Severn Trent have growth schemes planned for: Stroud, Stonehouse, Cam and the Gloucester Fringe,* ***however the scheme at Cam does not yet account for the additional flows from the Land at Wisloe".***

6.2 It is worrying that there is no evidence to suggest there is an agreed plan to manage the additional flows from the land at PS37. Not only does the River Cam contain protected species, but it supplies water to the WWT.

7.0 Relevant Planning Policies

7.1.1 [9]Para 170 of the NPPF states, Planning policies and decisions should contribute to and enhance the natural and local environment by:
(a) **protecting** and enhancing valued landscapes, **sites of biodiversity** or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); (emphasis added)

7.1.2. [9]Para 171 of the NPPF states that plans should: **distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value**, where consistent with other policies in this Framework ; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries (emphasis added).

7.1.3 [9]Para 174 of the NPPF – to protect and enhance biodiversity and geodiversity, plans should: (a) **Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity ; wildlife corridors and stepping stones that connect them**; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation ; and (b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity (emphasis added).

7.1.4 [9]Para 177 of the [9]NPPF states that the **presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site** (either alone or in combination with other plans or projects), **unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site** (emphasis added).

7.1.5 With respect to the [9]NPPF para's 170, 171 and 177, SDC as the competent authority has failed to acknowledge there was a need to undertake further levels of evidence gathering and evaluation to adequately protect the European site's functionally linked land, SNA and protected species, even though this has been raised in representations submitted at the Regulation 18 stage. PS37 should therefore be identified as functionally linked land to the SPA, and the River River Cam as a functionally linked watercourse, within the HRA of the Local Plan as outlined in 3.3.

7.2 The Government 'A Green Future: Our 25 Year Plan to improve the Environment 2018' Plan

7.2.1 The [9]25 year plan states that New development will happen in the right places, delivering maximum economic benefit while taking into account the **need to avoid environmental damage**. We will protect ancient woodlands and **grasslands** (emphasis added).

7.2.2 SDC as the competent authority has failed to acknowledge that there was a need to undertake further levels of evidence gathering and evaluation to adequately protect the European site's functionally linked land, SNA and protected species, even though this has been raised in representations submitted at the Regulation 18 stage.

8.0 Summary

8.1 PS37 does not conform to the requirements of NPPF paragraphs 170, 171, 174 and 177 or the Government Plan 'A green future: Our 25 year plan to improve the environment 2018'.

8.2 There is documented evidence of protected species, including Eurasian Curlews which are identified as interest feature 7 of the Severn Estuary Special Protection Area (SPA) as part of the internationally important assemblage of waterfowl, meaning that the open agricultural land of PS37 and the surrounding area are both important for curlew and provide supporting habitat for the Severn Estuary SPA. There would be a loss of habitat outside a European site boundary that is currently serving a supporting role for the European site. PS37 should therefore be identified as functionally linked land to the SPA within the HRA of the Local Plan.

8.3 PS37 adjoins the River Cam at Cambridge, which incorporates a Strategic Nature Area (SNA). There is evidence to suggest that with respect to the SAC and Ramsar, the River Cam constitutes a Functionally Linked Watercourse. Given the importance of PS37 as Functionally Linked Land and the SNA, it is unclear why SDC did not refer PS37 to this to Natural England.

8.5 The HRA does not assess disturbance and the urban effects from development such as light pollution and at predation.

8.6 The promoters of PS37 commissioned an appraisal in August 2019 which identified many protected species and recommended a full assessment of the site. This has not been done.

8.7 Assessment of additional foul water flows from PS37 into the River Cam has not been considered.

Endnote

[1]WWT Website

[2]Habitats Regulations Assessment of the Stroud District Local Plan Review Pre-submission Draft Plan

[3]Sustainability Appraisal Scoping Report (April 2018)

[4]Sustainability Appraisal Report for the Stroud District Local Plan Review – Pre-submission Draft Local Plan

[5]Curlew Recovery Partnership (CRP) website

[6]BBC news article Curlew: Urgent work needed to save 'loved' endangered bird - BBC News

[7]WWT website Eurasian curlew recovery | WWT

[7]Promoters Ecology Reports (2019)

[8] Local Plan Review: Infrastructure Delivery Plan (2021)

[9]National Planning Policy Framework (NPPF)

APPENDIX 1

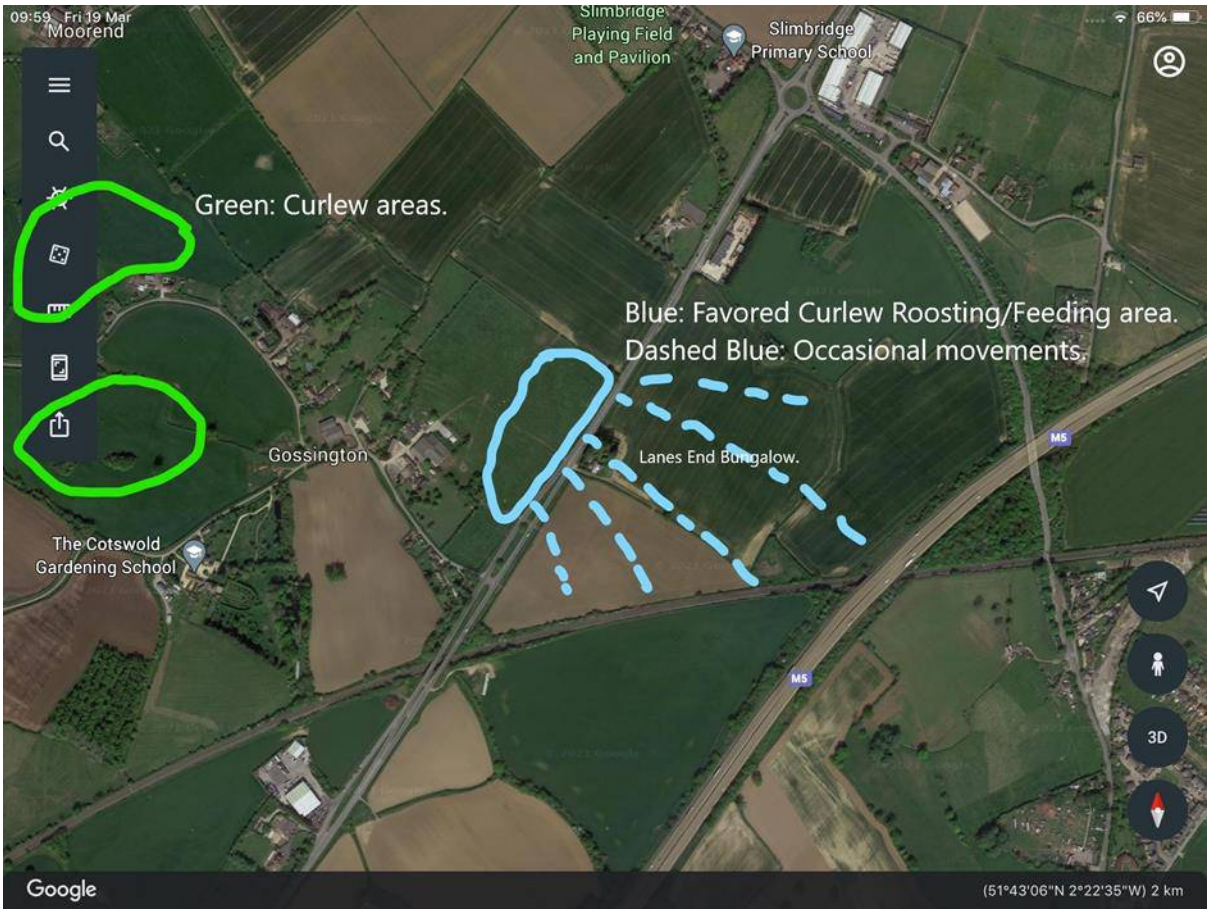
IN CONFIDENCE

Dear [redacted]

Further to our conversation last week about the Curlew Recovery Project, please find information below.

The map and following photographs attached show areas where Curlews are seen every year between approximately July and December. The photos included have been selected as they generally have a geographical landmark of some kind to help identify and confirm the area sighting. We have other photos and some video of mixed quality.

Please let us know if you need further information.



30th November 2018. Blue map area. Looking east towards raised motorway embankment. Curlew.

30th November 2018. Blue map area. Looking east towards raised motorway embankment. Curlew.

31st August 2020. Blue map area. Looking east towards raised motorway embankment. Curlew.

31st August 2020. Blue map area. Looking east towards raised motorway embankment. Curlew.

31st August 2020. Blue map area. Looking north towards Slimbridge Church. Curlew.

31st August 2020. Blue map area. Looking north towards Slimbridge Church. Curlew.

31st August 2020. Blue map area. Looking north towards Slimbridge Church. Curlew.

30th November 2018. Blue map area. Looking east towards Lanes End Bungalow and motorway embankment. Curlew.

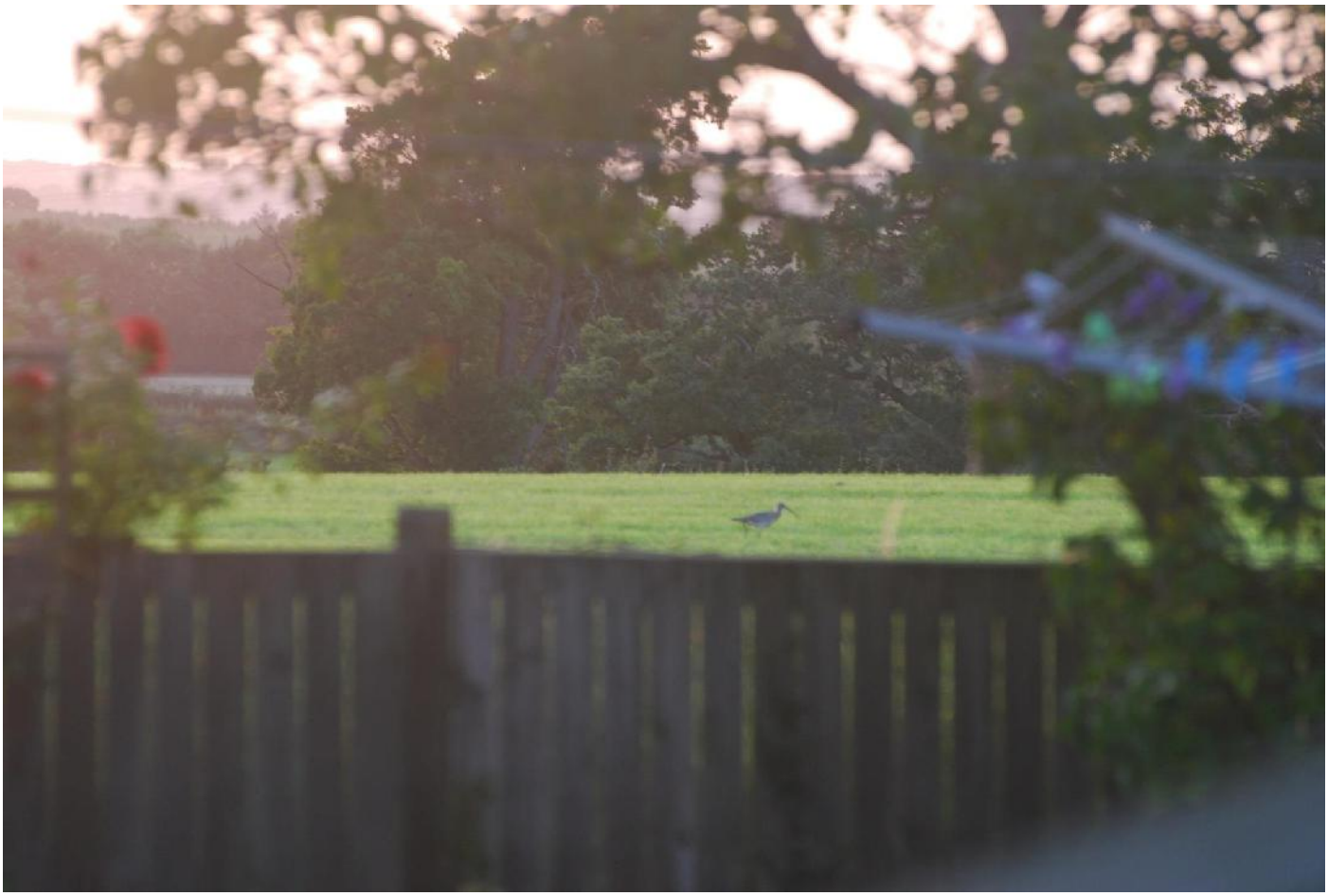
30th November 2018. Blue map area. Looking east towards Lanes End Bungalow and motorway embankment. Curlew.

12th September 2020. Green map area. Rear of ‘Grasea’ cottage. Curlew.

12th September 2020. Green map area. Rear of ‘Grasea’ cottage. Curlew.

12th September 2020. Green map area. Rear of ‘Grasea’ cottage. Curlew.

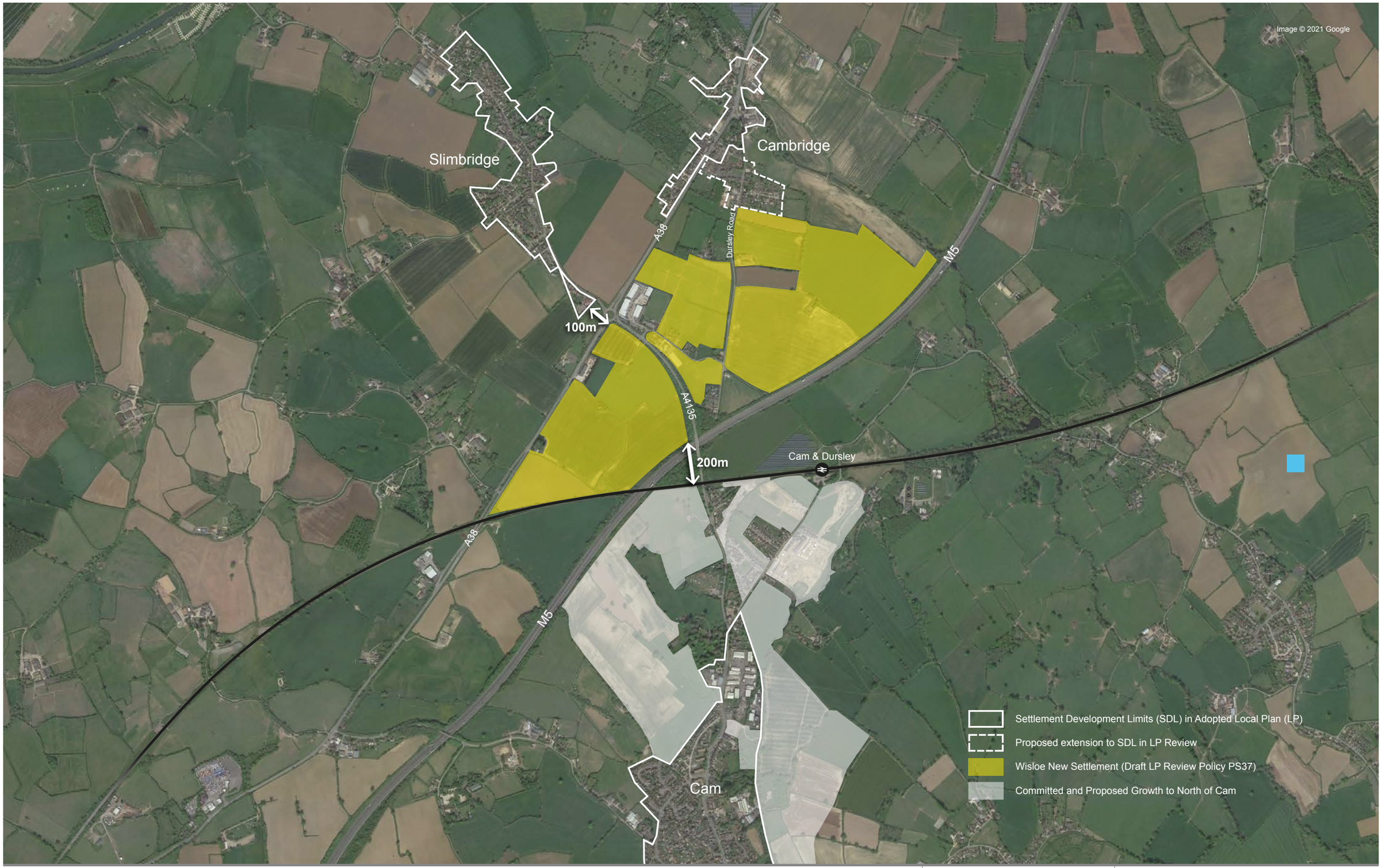
12th September 2020. Green map area. Rear of ‘Grasea’ cottage. Curlew.



13th September 2020. Green map area. Rear of ‘Chesieres’ cottage. Curlew.

13th September 2020. Green map area. Rear of ‘Chesieres’ cottage. Curlew.

Appendix 17



COALESCING EFFECT OF WISLOE NEW SETTLEMENT PROPOSAL

Stroud Local Plan Review (Regulation 19) Representations

Client: **Slimbridge Parish Council**

1624/0?
14/06/2021

1:15,000 @ A3

metres 500

N

jb planning associates
town planning
and development
consultants

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Appendix 18

Protection of archaeology at PS37 Wisloe

1. The co-sponsors for development at PS37 Wisloe Green, Gloucestershire County Council (GCC) and the Ernest Cook Trust (ECT), commissioned a heritage assessment by Cotswold Archaeology[1] in May 2019 which was published in September 2019.

2. The assessment mentioned in paragraph 3.10:

> *'systematic field walking recorded an assemblage of Romano-British pottery sherds and building material fragments; coins are also reported from chance finds and non-systematic metal detecting'*

3. This quote refers mainly to a brief field walk conducted by members of Slimbridge Local History Society[2] on the 13 October 2001 and published in the Glevensis, the official publication of the Gloucestershire Archaeology Society in 2003. The Cotswold Archaeology assessment did not give a reference, but it is provided below. When taken in context of later findings, after the assessment was completed, the artefacts were more important than the assessment suggests.

4. They clearly showed the presence of high-status occupation including pottery, roof tiles and hypocaust from Roman heating systems. Therefore, even at this stage, it can be safely assumed that at least one and maybe more Roman buildings will be found on PS37. This is hardly surprising given the proximity to the Roman road and even more so when more recent discoveries are taken into account. Photographs of the artefacts are at Appendix 1.

5. The Cotswold Archaeology assessment concluded that:

> *6.2. The Site has high potential for Romano-British settlement remains and possible remains of the Gloucester to Sea Mills Roman road. The Site has potential for medieval settlement remains, and more limited potential for Saxon settlement remains. The Site has some limited potential for Prehistoric remains, particularly later prehistoric deposits associated with the known settlement to the south of the Site.*
>
> *6.3. The proposed residential redevelopment of the Site would likely result in the truncation and/or total removal of the anticipated archaeological resource within the Site. None of these remains are anticipated to be of such significance that they would preclude such redevelopment. However, a programme of archaeological evaluation works would be recommended in order to establish the nature and extent of the potential archaeological deposits, and establish their significance, in order to design a programme of archaeological works which could mitigate for the harm of their removal (through residential redevelopment of the Site, through preservation by*

[1] Land at Wisloe Green, Slimbridge/Cambridge, Gloucestershire, Heritage Assessment September 2019

[2] Fieldwalking at Slimbridge in 2001 - Glevensis 36 2003

record. It may also be possible, through heritage led design measures, to preserve some of the identified archaeological resource in-situ.

6. In January 2020 [redacted], GCC Heritage Team Leader, reassured the Wisloe Action Group in an email[3] that he was well aware of the *'potential for significant archaeology and we will be recommending a full range of archaeological evaluation before any planning permission is in place'.*

7. There is a paragraph in the National Planning Policy Framework 2019[4] which merits furthermore examination:

> **187. Local planning authorities should maintain or have access to a historic environment record. This should contain up-to-date evidence about the historic environment in their area and be used to:**
>
> **a) assess the significance of heritage assets and the contribution they make to their environment; and**
>
> **b) predict the likelihood that currently unidentified heritage assets, particularly sites of historic and archaeological interest, will be discovered in the future.**

8. Clearly then, GCC were well aware of the significance of the site but were not prepared to investigate further until after PS37 had been approved. As GCC were one of the co-sponsors it was clearly reluctant to investigate, and possibly confirm, just how significant the site might be. This directly contradicts the requirement in NPPF paragraph 187 above.

9. In the Wisloe Action Group's (WAG) consultation response to Stroud District Council's (SDC) Draft Local Plan Consultation[5] in January 2020 details of recent discoveries made after the Cotswold Archaeology assessment, were provided. They were as follows:

> *In the summer of 2017 permission was given for a detectorist rally on land behind Lancelot Close just north and west of the church. To everyone's surprise literally hundreds of Roman coins, brooches and artefacts were found. The detectorists were given permission to conduct three more rallies at other sites in the parish before it was realised that they were simply looting most of what was being found. The location of the finds was not being recorded and the vast majority were never seen again.*
>
> *The rallies were stopped and, with the kind permission of the tenant and the landowner, Berkeley Estate, the Slimbridge Local History Society (SLHS) began coordinating a project to geophysically scan and systematically metal detect three fields in the parish. It soon became apparent that not only was there a significant Roman presence in the parish but also an Iron/Bronze Age*

[3] Slimbridge Development 7 January 2020 at 08:49
[4] NPPF February 2019
[5] Wisloe Action Group's (WAG) consultation response to Stroud District Council's Draft Local Plan Consultation - hand delivered 21 January 2020

settlement on the Lighten Brook. Hundreds of Roman coins and artefacts from around the second to third century AD have been recovered along with a whole range of items associated with Roman settlement and also a small number of Iron/Bronze Age coins. A Romano British double-ditch enclosure was found in Lynch Field close to Rectory Farm along with signs of an Iron/Age roundhouse next to Lighten Brook on Lightenbrook Lane.

All the finds were carefully mapped and shared with [redacted] the Gloucestershire and Avon Finds Liaison Officer based at Bristol City Museum & Art Gallery. Geophysical scanning was conducted by [redacted] of Archeoscan[6]. Members of SLHS provided field support to the scanning and an educational programme was started by the society with local schools and information shared with the local community. [redacted] report is available from the Gloucestershire County Council (GCC) Heritage Team.

Possible unexploded WWII munitions

One elderly resident recalls a German bomber dumping its bombs just off Dursley Road. He was in one of the six houses nearest the M5 and was sheltering under a table in one of the houses when the bombs were dropped, blowing out the windows of the houses. He recalls playing in the bomb craters but, given the overgrown nature of the soft ground at the time, he can't be sure that all the bombs exploded. He would be willing to pinpoint the location if asked.

Significance of the discoveries

The significance of the two discoveries, Lanes End Bungalow Field <u>(part of PS37)</u> *and Lynch field, is that they are linked by Lightenbrook. Firstly, the brook would have been crossed by the Roman Road. Secondly, the gravel bed would have provided high quality drinking water for travellers and those living in Lynch field and, lastly, the brook would have given access to the River Severn. This almost certainly shows settlement occupation stretching between at least Lanes End Bungalow field on the Roman road and a settlement on what would have then been the banks of the River Severn and may well extend over all the land earmarked for development. The view that there is a larger archaeological landscape is enforced by aerial photographs showing distinct and as yet unexplored cropmarks in fields behind Tyning Crescent which would link the two sites. This is a far larger and more significant settlement than was previously recognised.*

It also seems quite possible that this was also the site of a road junction leading not only to the Roman town of Corinium, present day Cirencester, but also the River Severn. Slimbridge would have been pretty much equidistant to all three major Roman towns, Bristol, Gloucester and Cirencester, and therefore a logical place for the interchange of materials and people. You could view this settlement area as a military and civilian settlement at a

[6] Geophysical Survey at Slimbridge, Gloucestershire - A gradiometer survey of fields surrounding the village of Slimbridge, Gloucestershire 2019. AJ Roberts BSc (Hons), MA, ACHA

crossroads which formed a vital, major location for trade, manufacturing and the import of goods from across the Roman Empire. If this so, this would be an unprecedented discovery in the Severn Vale.

10. Further geophysical scanning in what is called Stanborough Mead, next to the Lightenbrook west of Slimbridge village, has revealed a very large building of Roman origin. Test pits were dug in October 2020 and two items were sent to Glasgow University for radiocarbon dating. A bone knife handle dates from the turn of the second century and burnt remains from around 240AD. Stanborough Mead is approximately two kilometres from PS37 and similarly on the banks of Lightenbrook.

11. A full post-excavation report and archaeological evaluation was published in November 2020.[7] It is worth quoting some paragraphs from the report:

11.1 The discovery of the significant Roman remains in this location potentially has a huge significance in the story of the Roman development in Gloucestershire. Given the large amount of coinage, and other metal artefacts, recovered from the Lynch Field it can be speculated that this area around Slimbridge may have been the location of a port or trading area located on the banks of the Severn. If the large structure that has been identified in Stanborough Mead dates to the 1st and 2nd centuries AD, it could indicate that this potential port has a strategic significance in this early period. There is no doubt that the structure was significant in size. It has a footprint over 3200m2. If it was a domestic building that is large comparison with other structures in Gloucestershire. If it is not domestic, but a storage/military facility, it may indicate military control of trade at this location and again point to the significance the Slimbridge locality. Either type of structure, in this location, is both unusual and significant, even more so if it were to prove to be a military facility dating to the 1st century AD.

11.2 A port facility at Slimbridge in the 1st Century AD may make sense given the political and geographical landscape of the period. The Colonia at Gloucester (Glevum) was established in 97 AD and until that point the dominant facility in Gloucester was the Kingsholm fortress. A port/trading area at Slimbridge would allow supplies to flow to the Gloucester area by road and inland towards Cirencester without having to sail the additional distance around the Noose in the Severn. Equally the Severn could be easily crossed here to allow goods and supplies to flow into/out of South Wales in a much timelier fashion than travelling up to Gloucester and back.

11.3 The landscape setting of the large buildings in Stanborough Mead is also significant. It can be seen from the LIDAR images at Annex F that the complex is located on effectively a spur of higher ground projecting into the lower ground of the Severn Estuary. Different Severn levels could have meant that this location was highly visible for traffic sailing up the Severn and heading for the port facility at Slimbridge. It could also be significant that the 'inlet' formed by the higher ground to the North of the location of the buildings leads to the Lynch Field where the thousands of coins and metal artefacts have been recovered. Is it possible

[7] Stanborough Mead Archaeological Evaluation 2020, November 2020, A J Roberts BSc (Hons) MA ACIfA

that this stone complex could have been a 'controlling' or dominant building in the functioning of a trading centre at Slimbridge?

11.4 Notwithstanding the Roman presence in Stanborough and Lynch field it must not be overlooked that there is a significant Iron Age presence. The geophysics has identified several areas of extensive Iron Age occupation underlying the Roman settlement that is starting to be identified. A significant question must be whether the area was a major trading/port area in the Late Iron Age, a function that was continued after the Roman conquest.

11.5 Whatever the speculation there is no doubt that, given the presence of significant prehistoric settlement, large, potentially early, Roman stone buildings and thousands of coins and brooches have been identified in the landscape around Slimbridge. This area around Slimbridge has a significant strategic importance in the local landscape. Should further work indicate that the buildings in Stanborough Mead date to the 1st Century AD this would be a significant addition to the understanding of the Roman presence in Gloucestershire, particularly on the Severn foreshore.

12.1 The initial findings of the evaluation are both exciting and promising. The presence of large Roman structures in this part of the Slimbridge landscape potentially is incredibly significant in understanding the development of the Slimbridge area and potentially the development of the Late Iron Age/Roman Landscape in this part of Gloucestershire.

12.2 It would greatly assist the understanding of the landscape setting of the Roman buildings to continue to expand the geophysical survey in the surrounding areas. These large buildings probably did not stand in isolation but had a relationship with a larger community in the vicinity. The evidence collated to date suggest that the wider landscape around Slimbridge is more populated in the early Roman period that previously understood and could have a much greater strategic significance than currently believed.

12. In addition to the above, a Roman villa was discovered on the neighbouring Bovis Homes housing development at Box Road Cam in early 2020. This discovery forced a major redesign of the development in order to preserve the villa. [redacted], Cotswold regional director at Bovis Homes stated:

"Bovis Homes is very proud to preserve a valuable part of Cam's history and an information board, at the location of the remains, has been placed for the community. We'd also like to thank TVAS for their commitment and support throughout the findings and preservation process.

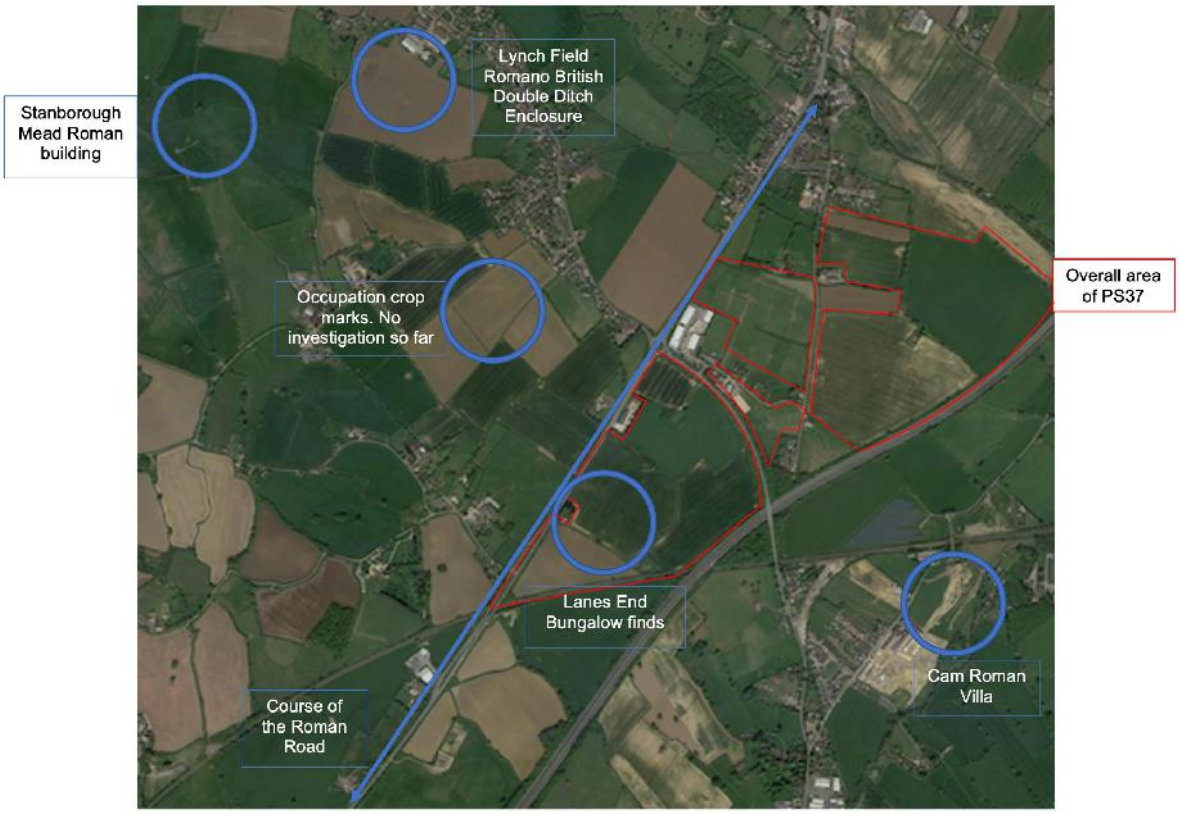
"We've been working closely with the local community and local councillors, to work through a coordinated approach to maintaining the villa and we're delighted to preserve these historical artefacts.

"We redesigned our development after discovering the remains, so that no homes are built on top and have done all we can, with TVAS, to ensure these findings last forever." My emphasis.

13. This statement is available on the Bovis Homes website.[8] It could be argued that the discovery was unexpected however, the same could not be said for Wisloe.

14. There was, therefore, ample proof from a variety of expert sources of the likelihood of a substantial Roman settlement stretching from what would have been the banks of the River Severn, across the Roman Road over PS37 and reaching into Cam.

15. By early 2020 a clear picture was emerging. The initial assessment was correct as far as it went, although it played down the findings from the field walk and did not provide the full details of the findings. The subsequent later discoveries on both sides of PS37 revealed the likely presence of an extensive early Roman settlement contemporary to the establishment of Gloucester as a military outpost. This is a simplified map showing significant finds mentioned earlier but leaving out the multiple, more detailed reports, to be found on the Historic Environment Record held by GCC.



16. Despite the requirements of the NPPF, SDC has chosen not to take heed of the WAG response to the initial consultation, the discovery at Stanborough Mead and the discovery of the Roman villa off Box Road. GCC has deferred further investigation until the planning application stage. Therefore, through inaction, SDC and the proposers have simply crossed their respective fingers and hoped for the best. The lack of a development strategy, save a few colourful maps and leaflets,

[8] https://www.bovishomes.co.uk/news/revised-plans-see-new-part-of-cam-community-taking-shape-around-roman-villa-remains-/

demonstrates an unprofessional approach unlike what would have been expected from a developer.

17. Given the deferral of any archaeological investigation by the proposers, the true historical value of PS37 remains unknown. There is a strong possibility that the opportunity to further investigate the parish's history in a timely manner will be compromised. Importantly, significant discoveries could fatally undermine the delivery requirements for PS37 in terms of time and the required number of houses leaving the overall Local Plan seriously compromised.

18. This is in sharp contrast to the developer led proposal at PGP1, Whitminster, where the developer has invested a considerable sum in having the site geophysically scanned and test trenches dug. This professional approach has ensured that the development will not be compromised and building work can be commenced quickly if the site were included in the Local Plan.

19. We will pass over the lack of follow up on the possibility of there being unexploded munitions on the site as this is not a heritage consideration but is a serious public health risk should the development proceed.

20. This laissez-faire approach is non-compliant and puts the safety, deliverability and viability of the Wisloe site in serious doubt.

Wisloe Action Group June 2021

Appendix 1.

Appendix 19

The High Pressure Gas Pipeline at Site PS37 (Wisloe Green)

HSE "ADVISE AGAINST" DEVELOPMENT

Author

[redacted], Member of the Wisloe Action Group. Scientific background and spent entire career working on military system for the Ministry of Defence and as a Consultant. Now retired.

Objective

1. To inform all interested parties of the dangers of developing PS37 because of the presence of a High Pressure Gas Pipeline (>7 bar) running through the site.

Background

2. As part of the Stroud District Draft Local Plan a development site was proposed near Slimbridge for a "Garden Village", by The Ernest Cook Trust and Gloucestershire County Council. Local opposition from residents in Slimbridge Parish resulted in a public meeting held on 21 December 2019 and the formation of the Wisloe Action Group (WAG), which was charged with putting forward a case opposing PS37. A Dossier was prepared and presented to SDC in January 2020 as part of the Public Consultation process. Part of the Dossier covered the implications of a High Pressure Gas Pipeline (>7 bar) running approximately north–east / south-west through the site.

Utilities present on the site

3. Linesearch provide a service which is designed to be used by anyone that needs to know where utility assets (pipelines and cables) are in order to work safely and provide an online app which allows users to identify and map all utilities which pass through a site: https://www.linesearchbeforeudig.co.uk/)
This showed two utilities running through the site:

Zayo fibre optic cables. This utility will not be considered for the purposes of this document.
Wales and West Utilities >7 bar high pressure gas pipeline.

Health and Safety Executive

4. The Health and Safety Executive have a Statuary Duty to advise Local Authorities on land use planning near dangerous installations, including High Pressure Gas Pipelines. They provide an online app which identifies any installations of interest to the HSE and also defines a "Consultation Distance" (CD) from the installation. The CD is divided into three zones, the inner, middle and outer zones. The app then defines the type of development which would be allowed in each zone. The methodology is defined by the HSE in the Land Use Planning Methodology Document (https://www.hse.gov.uk/landuseplanning/methodology.htm).

5. The Wisloe Action Group registered with the HSE and ran the App on PS37, which identified the pipeline and stated that this was of interest to the HSE. The HSE also provided a

map identifying the position of the inner, middle and outer zones, (See Annex B). Further discussion with HSE defined the zone distances from the pipeline, (see Annex C). The distances for each zone either side of the pipeline were:

Inner zone – 16 metres
Middle zone – 49 metres
Outer zone – 70 metres

6. The zones are shown on the 1:25000 scale map of the proposed site at Annex C. The extent of PS37 is shown in blue. The pipeline is marked in red, the Middle Zone is marked in green and the Outer Zone is marked in purple.

7. The HSE methodology defines Development Types and assigns a Sensitivity Level (SL1,2,3 or 4) to each type. SL4 is the most sensitive level. The HSE would then "advise against" or "do not advise against" for development types in each zone. Applying the methodology to the PS37 Inner, Middle and Outer Zones, relating to the proposed types of development yields the following results:

Development	Development Type	Sensitivity Level	Inner Zone	Middle Zone	Outer Zone
5 hectare industry	DT1.1 or DT1.1z1	SL1 SL2	DAA AA	DAA DAA	DAA DAA
1500 houses	DT2.1x2	SL3	AA	AA	DAA
Primary school	DT3.1 or DT3.1x2	SL3 SL4	AA AA	AA AA	DAA AA
Community Centre	DT2.4 or DT2.4x2	SL2 SL3	AA AA	DAA AA	DAA DAA
Public open space	DT2.5	SL2	AA	DAA	DAA

AA – Advise Against
DAA – Do Not Advise Against

8. These data above shows that the available land for house building would be significantly reduced and fall below the 1500 minimum required for a "garden village".

Stroud District Council's analysis

9. SDC carried out an independent analysis with HSE. HSE "advised against development" and agreed with the WAG analysis. This is reported at:
https://www.stroud.gov.uk/media/1166432/final-gas-pipeline-statement-website-june-2020_redacted.pdf

Consequences of a catastrophic failure

10. The advice given by HSE is defined in the Land Use Planning Document, referenced earlier and is based on the consequences of receiving a "dangerous dose", which is defined as:

Severe distress to all

A substantial number requiring medical attention
Some requiring hospital treatment
Some (about 1%) fatalities

11. Note that the DAA does not imply zero casualties; but that that the incidences would be less than the consequences listed above.

12. Examples can be found of high-pressure gas pipeline failures. To quote one incident, which occurred in Ghislenghien, Belgium on 30 July 2004. The French Ministry for Sustainable Development reported their analysis of the incident in a document, in English, entitled "Rupture and ignition of a gas pipeline 30 July 2004 Ghislenghien Belgium." (https://www.aria.developpement-durable.gouv.fr/wp-content/files_mf/FD_27681_Ghislengheinv_2004ang.pdf).

13. The explosion occurred two weeks after work on a car park was completed. 24 people were killed and 150 survivors were hospitalised, mostly with severe burns. Debris from the initial explosion was found 4 miles away. Up to 200 metres away, roof covering on commercial property liquefied. An 11metre section of the pipeline weighing more than one tonne was projected 150 metres. The crater produced was 10 metres diameter and 4 metres deep. The heat from the blast was felt 2 kilometres away. The economic damage was estimated to be 100 million euros. The report also noted:

"*Controlling urbanisation patterns plays a predominant role in limiting the effects of a potential accident capable of exposing third parties to strong thermal fluxes and excess pressure waves. The route of facilities conveying hazardous substances within an urban or industrialised zone, along with the layout of cut-off and control devices, would need to be studied in great detail.*
The presence of a flare extending over 100 m high subjected nearby installations to major thermal impacts and caused many fires around the periphery of the accident zone. The pipe shutdown step was complicated due to the onset of powerful vibrations propagating along the pipeline trajectory. Beyond the actual physical damage, psychological consequences may prove dramatic and require professional accompaniment by a counselling office and extended psychological monitoring of the exposed individuals."

14. The route of the pipeline running through PS37 would have been chosen (as can be seen from the map) to avoid population centres. The French report quoted above stresses the importance of limiting urban development near these pipelines as a means of limiting the effects of a potential accident. It would be counter intuitive to build a population centre around the pipeline, literally putting people in harm's way.

15. This accident is not unique and similar incidents occurred at:

Grenoble, 18 January, 1984
Perry (United States), 12 February, 2002
Carlsbad (United States), 19 August, 2000
Appomattox (United States), 14 September, 2008

16. Reference to the map at Annex C reveals some very important features of the site. The prevailing wind is from the West. The triangular part of the site to the East of the pipeline is bounded to the West by the pipeline, to the East by the M5 motorway and to the North by the

River Cam. It is important to recognise that, in the event of catastrophic failure, access to the site by large rescue equipment and evacuation of the site would be difficult, if not impossible, without a new heavy duty bridge across the M5.

17. The Institute of Gas Engineers and Managers (IGEM) in a document "Safety Advice for Emergency Services Attending Gas Escapes". https://www.igem.org.uk/_resources/assets/attachment/full/0/7611.pdf, advises that the evacuation zone for a high pressure gas pipeline should be a **minimum** of 750 metres each side of the pipeline. This zone would include Slimbridge Primary School, Cam & Dursley Railway Station and the M5 motorway. Closure of the M5 would imply significant economic damage to the UK.

Mitigation at PS37

18. It is very unlikely that any of the current pipeline has any sort of extra protection as it was originally laid in open farmland away from centres of population..

19. With the likely consequences of an accident at PS37 being extremely horrific, mitigation must be considered. One option would be to relocate the pipeline. On 4 November 2011 John Duncan of NRSWA Ltd (https://www.nrswa.net/case-studies/), reported in a case study that the estimated cost of moving 2 km of a similar pipeline at Didcot to be £8 million, (£10 million at 2021 prices). This is regarded as a minimum cost and could be considerably higher. It should also be noted that reference to the map at Annex C shows that a suitable site for re-location would be difficult to find. Another option would be to replace the pipeline with a stronger pipeline. Indicative costs are not available for this option but are likely to be similar to the relocation option.

The role of the Promoters

20. Despite the problems regarding the pipeline having been visible for many months, The Ernest Cook Trust and Gloucester County Council have failed to provide any useful information on their intentions regarding this serious problem.

21. Social, a PR company, acting on behalf of the Ernest Cook Trust provided the following undated input to SDC regarding the HSE evaluation of the pipeline. This is reported at: https://www.stroud.gov.uk/media/1166432/final-gas-pipeline-statement-website-june-2020_redacted.pdf

> "*The Health and Safety Executive's advice is in relation to only the small section of the site at Wisloe that the pipeline impacts. It is a key consideration for this part of the site as we progress plans. It is both an opportunity and a constraint. Considerations like this are common and our plans will obviously need to avoid development around the pipeline. We are exploring the exact area impacted which could increase or decrease depending on mitigations that could be made to the pipeline itself. This area presents an opportunity to form part of the network of open and green spaces that will help define the development at Wisloe. As we progress our plans we will do so in consideration of the pipeline and work alongside utilities companies, the Health and Safety Executive and all other relevant stakeholders – including the local community – to propose a solution that is sensible, attractive and of benefit to the local community and the environment*."

22. For Social to suggest that the route of the pipeline could be part of a "*network of open and green spaces"* is appalling. This would attract people to use the space, hence inevitably increasing the number of casualties in the event of a catastrophic failure of the pipeline. Logically, to minimise casualties, the area should be enclosed behind a substantial high fence to prevent public access.

23. Despite assurances that options are being examined, almost a year has passed and further information has not been presented by ECT or GCC. It is not sufficient to state that, once the site is in the Local Plan, that they will deal with the issues at the detailed planning stage. The problems raised are sufficiently serious such that detailed mitigation is needed at this stage to satisfy the valid concerns of current residents and the safety of future residents.

The role of Stroud District Council

24. The Wisloe Action Group has kept the Stroud District Council Planning Department fully informed of the dangers posed by this pipeline. They have chosen to ignore WAG's recommendation to remove PS37 from the plan and therefore Stroud District Council has accepted the risks documented in this paper.

Information for prospective purchasers

25. Given the likely domestic and industrial activity on the site, all prospective residents and businesses will need to be made aware of the existence of the pipeline, the implications should the pipeline be ruptured or fail and the developer's evacuation plans.

Conclusions

26. The High Pressure gas pipeline at PS37 represents a major threat to any development of the site and the site should be removed, for the following reasons:

HSE "Advise against development".
The risk of serious injuries and death is unacceptable.
Rescue and evacuation would be difficult.
The Promoters have failed to provide any useful information or mitigation.
Stroud District Council by including PS37 in the Local Plan have accepted the risks highlighted in this paper.

Wisloe Action Group
6 June 2021

Annex A

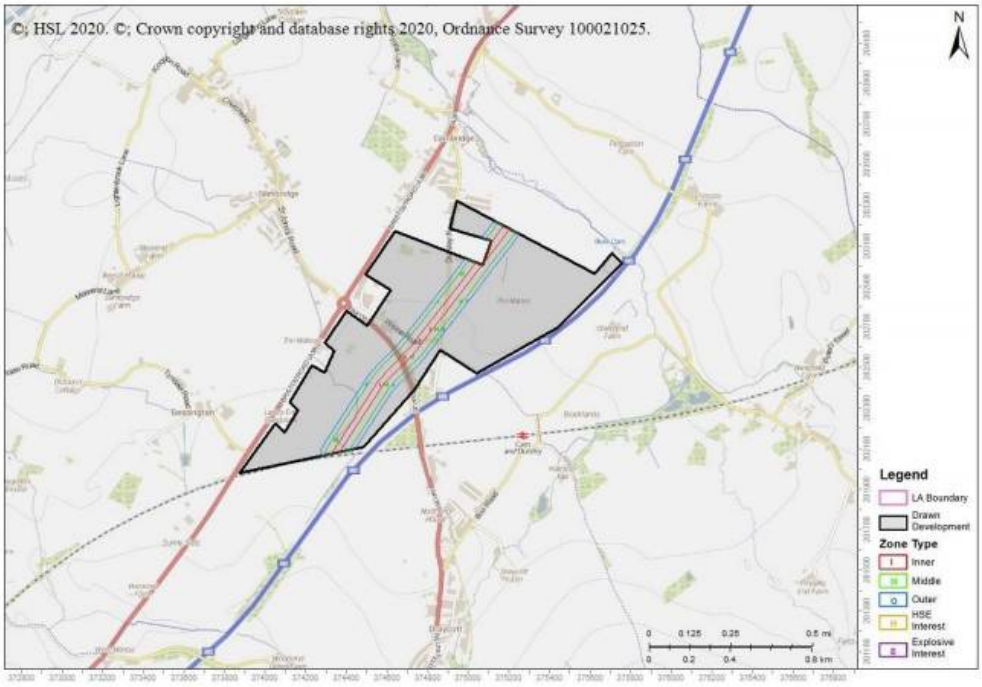
Wisloe Action Group
Beresford House
Slimbridge
Gloucestershire
GL2 7BL

Health and Safety Executive

Advice : HSL-200310161952-1368 Crosses Consultation Zone

Please enter further details about the proposed development by continuing with the enquiry on the HSE's Planning Advice Web App from the Previous Enquiries tab either now or at a later time, unless the Web App has stopped the process and notified you to contact HSE.

Your Ref: WAG1
Development Name: Wisloe Green
Comments:



Commercial In Confidence

The proposed development site which you have identified currently lies within the consultation distance (CD) of at least one major hazard site and/or major accident hazard pipeline; HSE needs to be consulted on any developments on this site.

This advice report has been generated using information supplied by David Thombs at Wisloe Action Group on 10 March 2020.

You will also need to contact the pipeline operator as they may have additional constraints on development near their pipeline.

- 7208_1477 Wales and West Utilities

HSL-200310161952-1368 Date enquiry processed :10 March 2020 (374803,202674)

Annex B

lupenquiries@hsl.gsi.gov.uk

to me

Dear XXXXX,

Thank you for your enquiry regarding possible developments at Wisloe Green.

HSE is a statutory consultee for certain developments within the consultation distance of major hazard sites and major accident hazard pipelines.

I have had a look at the information you have provided and there are HSE Consultation zones for a Major Accident Hazard Pipeline that affect your proposed development.

The details for the Major Accident Hazard Pipelines and their associated HSE zones are:
Name: **Gloucester / Wickwar (Ref: GW)**
HSE Ref: **7208**
Transco Ref: **1477**
Operator: **Wales and West Utilities**
HSE Consultation Zones
Inner Zone (in metres): **16**
Middle Zone (in metres): **49**
Outer Zone (in metres): **70**

These distances apply on either side of the pipeline. All distances should be measured from the centre of the pipeline. Where consultation distances coincide, the inner-most zone is used to determine HSE's Land Use Planning Advice.

Please contact the operator for any constraints they may have around the pipeline, and for a map showing the pipeline route. Please note that we only have indicative maps for the pipeline routes. If you wish to know the exact layout of the pipelines you will need to contact the pipeline operator.

HSE's Land Use Planning advice is based on an assessment of the risks from the pipeline as originally notified to HSE. It may be that in the vicinity of the proposed development the operator has modified the pipeline to reduce risks by, for example, laying thick-walled pipe. You may wish to consider contacting the pipeline operator to see if the pipeline has been modified in this area; if it has, then HSE is willing to reassess the risks from the pipeline (there may be additional costs for this), relative to the proposed development, if all the following details are supplied:

a) pipeline diameter, b) wall thickness, c) grade of steel, d) depth of cover over pipeline, e) start and finish points of thick-walled sections (this is not required if it is confirmed that they are more than 750m from all parts of the proposed development site. Please note that reassessment(s) may incur charges under our Option 3 consultancy services.

There is also further information on HSE's land use planning here: www.HSE.gov.uk/landuseplanning/

Please note we are now charging for elements of the pre-application advice to developers. The information provided in this email is part of our Option 1 service and is free, however options 2 and 3 will incur a charge. For further information please see www.hse.gov.uk/landuseplanning/developers.htm

If you require any further help please contact us.

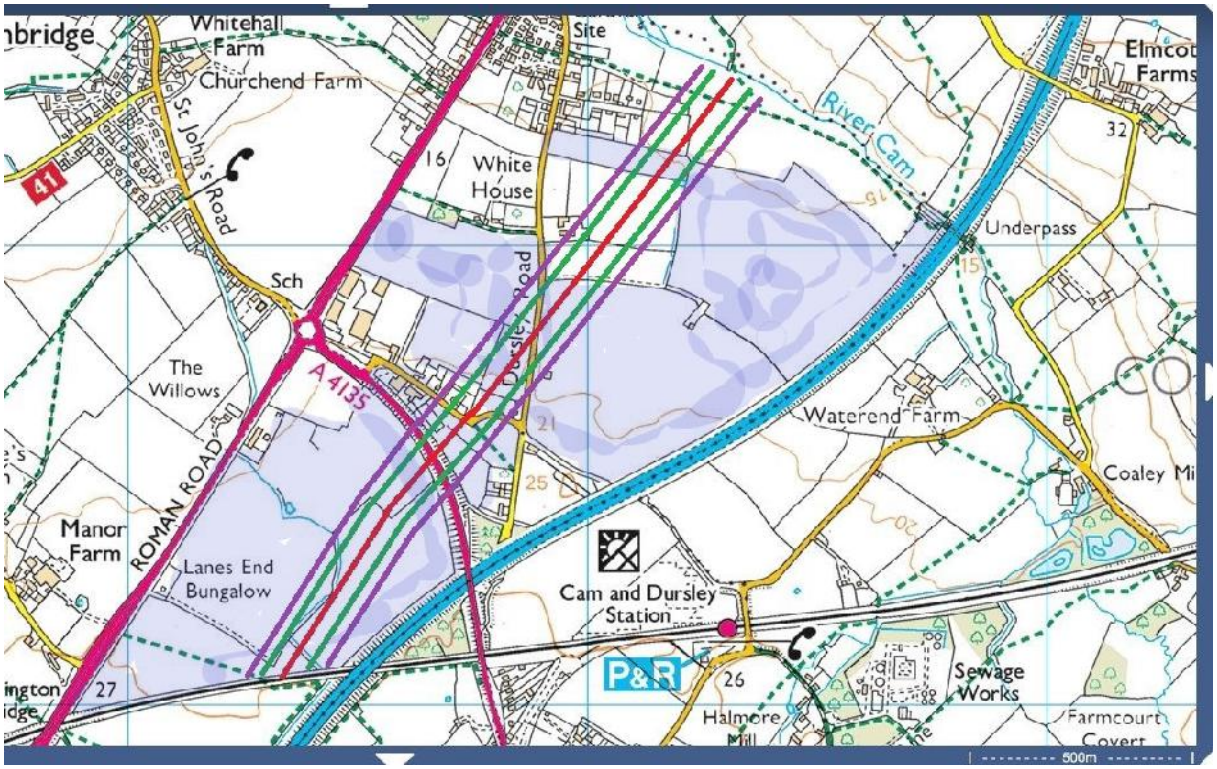
Regards

[redacted]

HSE's Land Use Planning Support Team
HSE Science and Research Centre
Harpur Hill, Buxton, Derbyshire, SK17 9JN
Direct: +44 (0) 203028-3708
Find out how HSE is **Helping Great Britain work well**

For HSE's Land Use Planning Advice Terms and Conditions, please click on the following link https://www.hsl.gov.uk/planningadvice and then click on 'terms and conditions'.

Annex C


Whitehall Farm
Churchend Farm
St John's Road
41
Site
16
White House
River Cam
Elmcot Farms
32
Underpass
15
Sch
A 4135
Dursley Road
The Willows
ROMAN ROAD
21
25
Waterend Farm
Coaley Mi
Manor Farm
Lanes End Bungalow
Cam and Dursley Station
P&R
26
27
Sewage Works
Halmore
Farmcourt Covert
500m

Appendix 20

INSIGHT
FEBRUARY 2020

Start to Finish

What factors affect the build-out rates of large scale housing sites?

SECOND EDITION

LICHFIELDS

LICHFIELDS

Lichfields is the pre-eminent planning and development consultancy in the UK

We've been helping create great places for over 50 years.

lichfields.uk

Executive summary

Lichfields published the first edition of Start to Finish in November 2016. In undertaking the research, our purpose was to help inform the production of realistic housing trajectories for plan making and decision taking. The empirical evidence we produced has informed numerous local plan examinations, S.78 inquiries and five-year land supply position statements.

Meanwhile, planning for housing has continued to evolve: with a revised NPPF and PPG; the Housing Delivery Test and Homes England upscaling resources to support implementation of large sites. Net housing completions are also at 240,000 dwellings per annum. With this in mind, it is timely to refresh and revisit the evidence on the speed and rate of delivery of large scale housing sites, now looking at 97 sites over 500 dwellings. We consider a wide range of factors which might affect lead-in times and build-out rates and have drawn four key conclusions.

In too many local plans and five-year land supply cases, there is insufficient evidence for how large sites are treated in housing trajectories. Our research seeks to fill the gap by providing some benchmark figures - which can be of some assistance where there is limited or no local evidence - but the averages derived from our analysis are not intended to be definitive and are no alternative to having a robust, bottom-up justification for the delivery trajectory of any given site.

We have drawn four key conclusions:

1 Large schemes can take 5+ years to start

Our research shows that if a scheme of more than 500 dwellings has an outline permission, then on average it delivers its first home in c.3 years. However, from the date at which an outline application is validated, the average figures can be 5.0-8.4 years for the first home to be delivered; such sites would make no contribution to completions in the first five years.

2 Lead-in times jumped post recession

Our research shows that the planning to delivery period for large sites completed since 2007/08 has jumped compared to those where the first completion came before 2007/08. This is a key area where improvements could be sought on timeliness and in streamlining pre-commencement conditions, but is also likely impacted by a number of macro factors.

3 Large greenfield sites deliver quicker

Large sites seem to ramp up delivery beyond year five of the development on sites of 2,000+ units. Furthermore, large scale brownfield sites deliver at a slower rate than their greenfield equivalents: the average rate of build out for greenfield sites in our sample is 34% greater than the equivalent brownfield.

4 Outlets and tenure matter

Our analysis suggests that having additional outlets on site has a positive impact on build-out rates. Interestingly, we also found that schemes with more affordable housing (more than 30%) built out at close to twice the rate as those with lower levels of affordable housing as a percentage of all units on site. Local plans should reflect that – where viable – higher rates of affordable housing supports greater rates of delivery. This principle is also likely to apply to other sectors that complement market housing for sale.

Key figures

180 sites assessed, with combined yield of 213k+ dwellings; 97 sites had 500+ homes

c.3yrs average time taken from outline decision notice to first dwelling completions on sites of 500+ homes

8.4yrs the average time from validation of the first planning application to the first dwelling being completed on schemes of 2,000+ dwellings

160 dpa the average annual build-out rate for a scheme of 2,000+ dwellings (median: 137)

68 dpa the average annual build rate of a scheme of 500-999 dwellings (median: 73)

+34% higher average annual build-out rate on greenfield sites compared with brownfield sites

61 dpa average completions per outlet on sites with one outlet, dropping to 51 for sites of two outlets, and 45 for sites with three outlets

01
Introduction

This is the second edition of our review on the speed of delivery on large-scale housing development sites. The first edition was published in November 2016 and has provided the sector with an authoritative evidence base to inform discussions on housing trajectories and land supply at planning appeals, local plan examinations and wider public policy debates.

Over this period, housing delivery has remained at or near the top, of the domestic political agenda: the publication of the Housing White Paper, the new NPPF, an emboldened Homes England, a raft of consultations on measures intended to improve the effectiveness of the planning system and speed up delivery of housing. Of particular relevance to *Start to Finish* was the completion of Sir Oliver Letwin's independent review of build out ("the Letwin Review"), the inclusion within the revised NPPF of a tighter definition of 'deliverable' for the purposes of five-year housing land supply (5YHLS) assessment, and the new Housing Delivery Test which provides a backward looking measure of performance. The policy aim is to focus more attention on how to accelerate the rate of housing build out, in the context of the NPPF (para 72) message that the delivery of a large numbers of new homes can often be best achieved through larger scale development such as new settlements or significant extensions to existing villages and towns, but that these need a realistic assessment of build-out rates and lead in times of large-scale development.

This second edition of *Start to Finish* is our response to the latest policy emphasis. It provides the planning sector with real-world benchmarks to help assess the realism of housing trajectory assumptions, particularly for locations where there have been few contemporary examples of strategic-scale development. The first edition looked in detail at how the size of the site affected build-out rates and lead in times, as well as other factors such as the value of the land and whether land was greenfield or brownfield. We have updated these findings, as well as considering additional issues such as how the affordability of an area and the number of outlets on a site impacts on annual build-out rates.

We have also expanded the sample size (with an extra 27 large sites, taking our total to 97 large sites, equivalent to over 195,000 dwellings) and updated with more recent data to the latest monitoring year (all data was obtained at or before the 1st April 2019).

Our research complements, rather than supplants, the analysis undertaken by Sir Oliver Letwin in his Review. The most important differentiation is that we focus exclusively on what has been built, whereas each of the sites in the Letwin Review included forecasts of future delivery. Additionally, the Letwin Review looked at 15 sites of 1,500+ homes, of which many (including the three largest) were in London. By contrast, the examples in this research sample include 46 examples of sites over 1,500 homes across England and Wales, the majority of which are currently active. As with the first edition of our research, we have excluded London because of the distinct market and delivery factors in the capital.

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03	**Timing is everything**	5
04	**How quickly do sites build out?**	9
05	**What factors influence build-out rates?**	14
06	**Conclusions**	18

180
sites

97
large sites of 500 units or more

27
additional sites compared with our 2016 research

8
sites also included in Sir Oliver Letwin's review

02 Methodology

The evidence presented in this report analyses how large-scale housing sites emerge through the planning system, how quickly they build out, and identifies the factors which lead to faster or slower rates of delivery.

We look at the full extent of the planning and delivery period. To help structure the research and provide a basis for standardised measurement and comparison, the various stages of development have been codified. Figure 1 sets out the stages and the milestones used, which remain unchanged from the first edition of this research. The overall 'lead-in time' covers stages associated with gaining an allocation, going through the 'planning approval period' and 'planning to delivery period', finishing when the first dwelling is completed. The 'build period' commences when the first dwelling is completed, denoting the end of the lead-in time. The annualised build-out rates are also recorded for the development up until the latest year where data was available at April 2019 (2017/18 in most cases). Detailed definitions of each of these stages can be found in Appendix 1. Not every site assessed will necessarily have gone through each component of the identified stages as many of the sites we considered had not delivered all dwellings permitted at the time of assessment, some have not delivered any dwellings.

Information on the process of securing a development plan allocation (often the most significant step in the planning process for large-scale schemes, and which – due to the nature of the local plan process - can take decades) is not easy to obtain on a consistent basis across all examples, so is not a significant focus of our analysis. Therefore, for the purposes of this research the lead-in time reflects the start of the planning approval period up to the first housing completion.

The 'planning approval period' measures the validation date of the first planning application on the site (usually an outline application but sometimes hybrid), to the decision date of the first detailed application to permit dwellings in the scheme (either full, hybrid or reserved matters applications). It is worth noting that planning applications are typically preceded by significant amounts of pre-application engagement and work, plus the timescale of the local plan process.

The 'planning to delivery' period follows immediately after the planning approval period and measures the period from the approval of the first detailed application to permit development of dwellings and the completion of the first dwelling.

Development and data

Whilst our analysis focuses on larger sites, we have also considered data from the smaller sites for comparison and to identify trends. The geographic distribution of the 97 large sites and comparator small sites is shown in Figure 2 and a full list can be found in Appendix 2 (large sites) and Appendix 3 (small sites).

Efforts were made to secure a range of locations and site sizes in the sample, but there is no way of ensuring it is representative of the housing market in England and Wales as a whole, and thus our conclusions may not be applicable in all areas or on all sites. In augmenting our sample with 27 additional large sites, new to this edition of our research, we sought to include examples in the Letwin Review that were outside of London, only excluding them

Box I: Letwin Review sites

1. Arborfield Green (also known as Arborfield Garrison), Wokingham
2. Ledsham Garden Village, Cheshire West & Chester
3. Great Kneighton (also known as Clay Farm), Cambridge (included in the first edition of this research)
4. Trumpington Meadows, Cambridge
5. Graven Hill, Cherwell
6. South West Bicester, Cherwell
7. Great Western Park, South Oxfordshire
8. Ebbsfleet, Gravesham and Dartford (included in the first edition of this research)

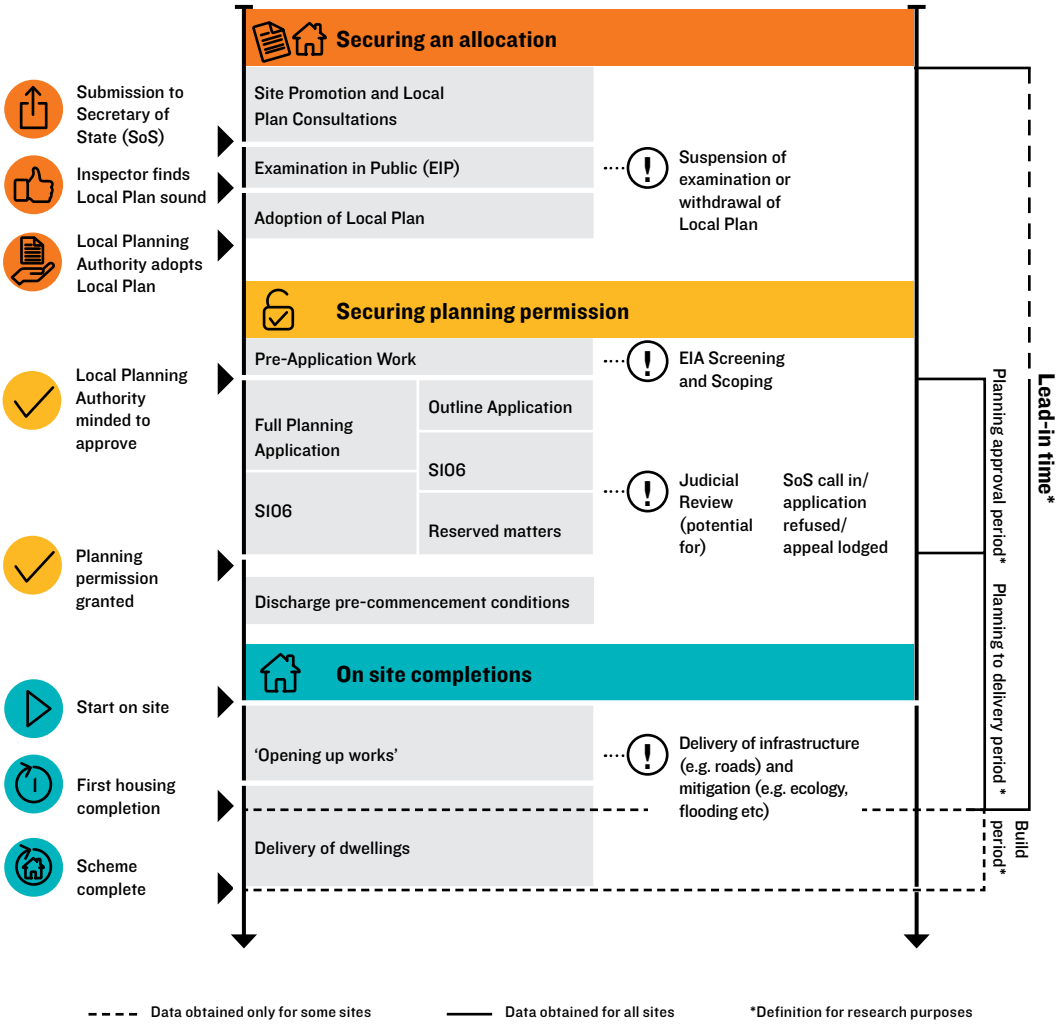
when it was difficult to obtain reliable data. The study therefore includes the Letwin Review's case studies listed in Box 1.

In most instances, we were unable to secure the precise completion figures for these sites that matched those cited in the Letwin Review. Sources for data Lichfields has obtained on completions for those sites that also appear in the Letwin Review are included at the end of Appendix 2.

The sources on which we have relied to secure delivery data on the relevant sites include:

1. Annual Monitoring Reports (AMRs) and other planning evidence base documents[1] produced by local authorities;
2. By contacting the relevant local planning authority, and in some instances the relevant County Council, to confirm the data or receive the most up to date figures from monitoring officers or planners; and
3. In a handful of instances obtaining/ confirming the information from the relevant house builders.

Figure I: Timeline for the delivery of strategic housing sites



Source: Lichfields analysis

[1] Monitoring documents, five-year land supply reports, housing trajectories (some in land availability assessments), housing development reports and newsletters

196,714

units on large sites of 500 or more homes

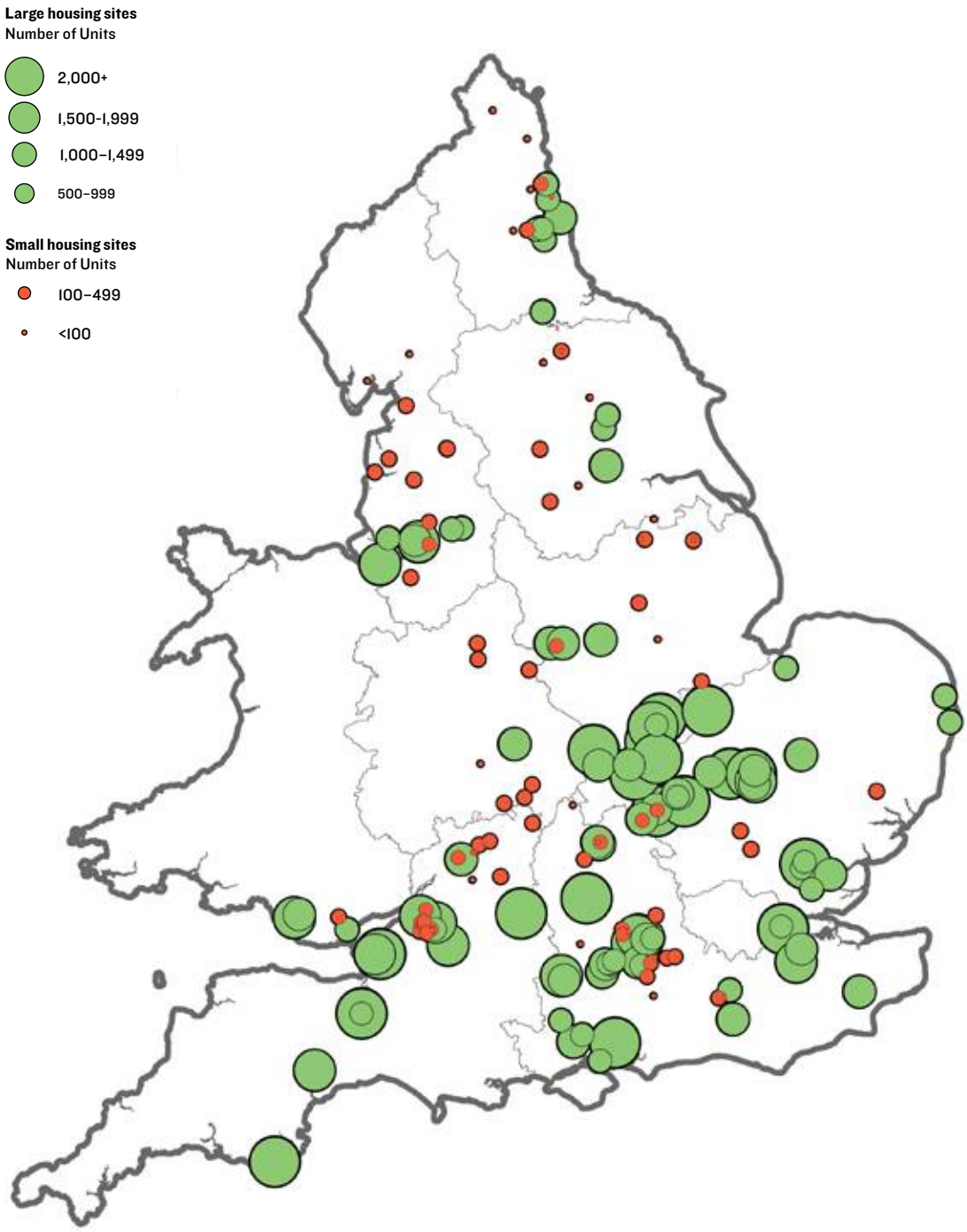
16,467

units on small sites under 500 homes

35

sites of 2,000 homes or more

Figure 2: Map of site sample by size of site (total dwellings)



Source: Lichfields analysis

03
Timing is everything: how long does it take to get started?

In this section we look at lead-in times, based on the time it takes for large sites to get the necessary planning approvals, 'the planning approval period' and also the time to get the first homes completed including the 'planning to delivery' period – this measures the period from the approval of the first detailed application to permit development of dwellings and the completion of the first dwelling. It is this period during which pre-commencement planning conditions have to be discharged as well as other technical approvals and associated commercial agreements put in place.

The new definition of 'Deliverable'

The question of how quickly and how much housing a site can begin delivering once it has planning permission, or an allocation, has become more relevant since the publication of the new NPPF with its new definition of deliverable. Only sites which match the deliverability criteria (i.e. suitable now, available now and achievable with a realistic prospect that housing will be delivered on the site within five years) can be included in a calculation of a 5YHLS by a local authority. This definition was tightened in the revised NPPF which states that:

"sites with outline planning permission, permission in principle, allocated in the development plan or identified on a brownfield register should only be considered deliverable where there is clear evidence that housing completions will begin on site within five years". (emphasis added)

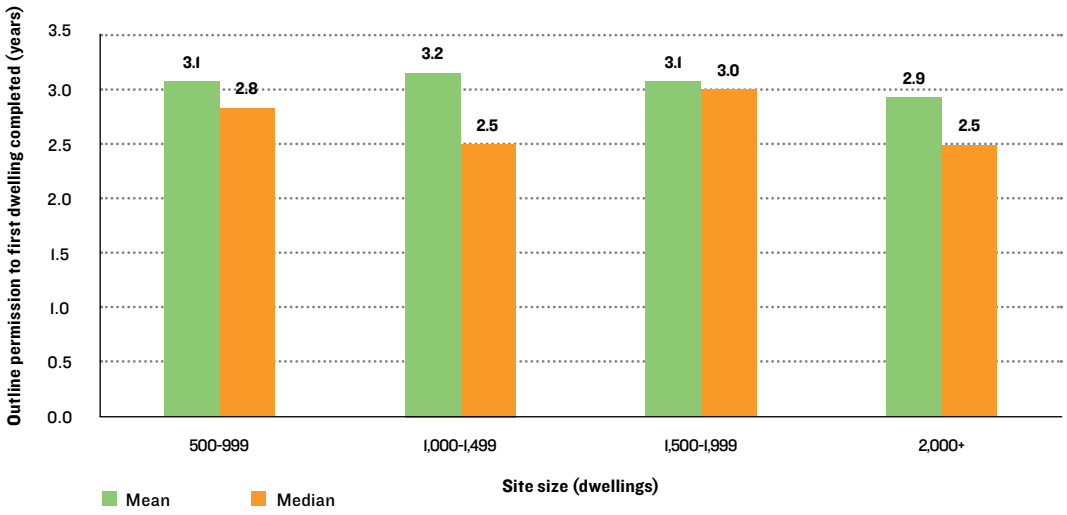
What constitutes 'clear evidence' was clarified in a number of early appeal decisions and in the Planning Practice Guidance[2] and can include information on progress being made towards submission of a reserved matters application, any progress on site assessment work and any relevant information about site viability, ownership constraints or infrastructure provision. In this context, it is relevant to look at how long it takes, on average, for a strategic housing site to progress from obtaining outline permission to delivering the first home (or how long it takes to obtain the first reserved matters approval, discharge pre-commencement conditions and open up the site), and then how much housing could be realistically expected to be completed in that same five-year period.

Based on our sample of large sites, the research shows that, upon granting of outline permission, the time taken to achieve the first dwelling is – on average c.3 years - regardless of site size. After this period an appropriate build-

c.3 years

average time from obtaining outline permission to first dwelling completion on sites of 500+ homes

Figure 3: Average time taken from gaining outline permission to completion of the first dwelling on site (years), compared to site size



Source: Lichfeilds analysis

[2] Planning Practice Guidance Reference ID: 68-007-20190722

Only sites of fewer than 499 dwellings are on average likely to deliver any homes within an immediate five year period.

out rate based on the size of the site should also be considered as part of the assessment of deliverability (see Section 4). Outline planning permissions for strategic development are not always obtained by the company that builds the houses, indeed master developers and other land promoters play a significant role in bringing forward large scale sites for housing development[3]. As such, some of these examples will include schemes where the land promoter or master developer will have to sell the site (or phases/parcels) to a housebuilder before the detailed planning application stage can commence, adding a step to the planning to delivery period.

Figure 4 considers the average timescales for delivery of the first dwelling from the validation of an outline planning application. This demonstrates that only sites comprising fewer than 499 dwellings are – on average - likely to deliver anything within an immediate five year period. The average time from validation of an outline application[4] to the delivery of the first dwelling for large sites ranges from 5.0 to 8.4 years dependent on the size of the site, i.e. beyond an immediate five-year period for land supply calculations.

Comparison with our 2016 findings

Planning Approval Period

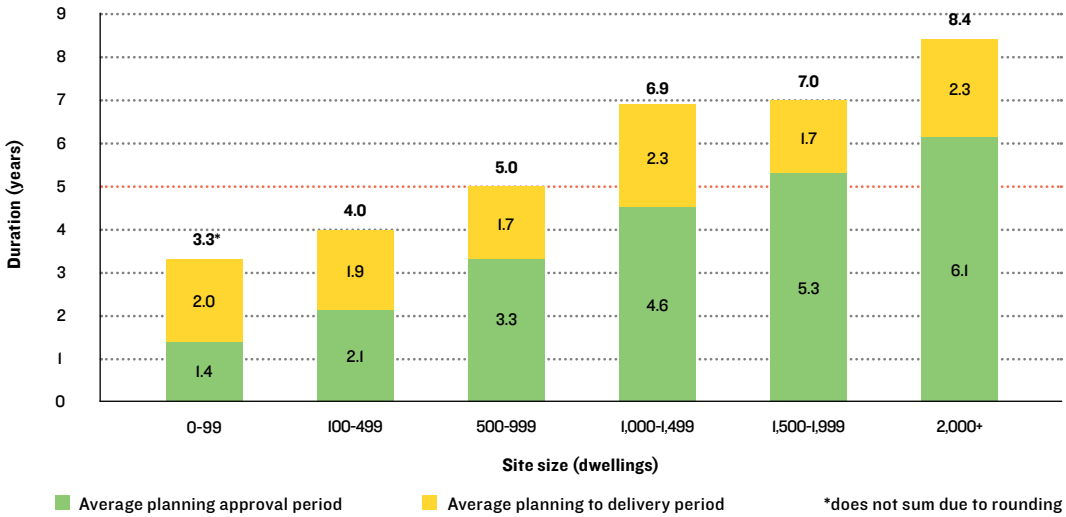
Our latest research reveals little difference between the average planning approval period by site size compared to the same analysis in the first edition (see Table 1). However, it is important to remember that these are average figures which come from a selection of large sites. There are significant variations within this average, with some sites progressing very slowly or quickly compared to the other examples. This is unsurprising as planning circumstances will vary between places and over time.

Table 1: Average planning approval period by size of site (years)

Site Size	1st edition research (years)	This research (years)
0-99	1.1	1.4
100-499	2.4	2.1
500-999	4.2	3.3
1,000-1,499	4.8	4.6
1,500-1,999	5.4	5.3
2,000+	6.1	6.1

Source: Lichfields analysis

Figure 4: Average timeframes from validation of first application to completion of the first dwelling



Source: Lichfields analysis

[3] Realising Potential - our research for the Land Promoters and Developers Federation in 2017 - found that 41% of homes with outline planning permission were promoted by specialist land promoter and development companies, compared to 32% for volume house builders.

[4] The planning approval period could also include a hybrid or full application, but on the basis of our examples this only impacts a small number of sites

Planning to Delivery Period

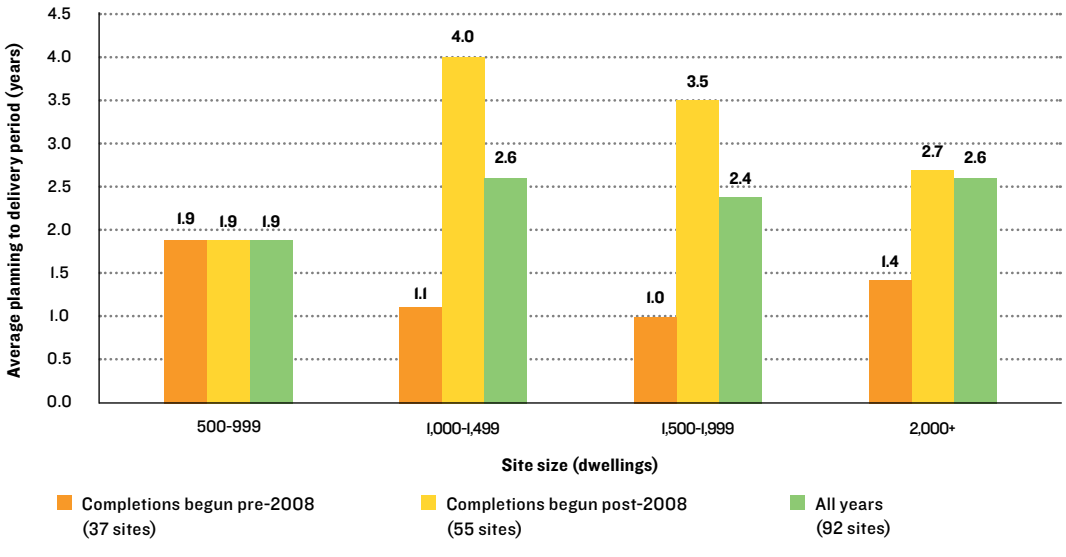
Although there is little difference between the average planning approval periods identified in this research compared to our first edition findings, the average lead-in time after securing of planning permission is higher in this edition of the research (Figure 5).

This is likely to be due to the inclusion of more recent proposed developments in this edition. Of the 27 new sites considered, 17 (63%) completed their first dwelling during or after 2012; this compares to just 14 (20%) out of 70 sites in the first edition of this research (albeit at the time of publication 8 of these sites had not delivered their first home but have subsequently). This implies that the introduction of more recent examples into the research, including existing examples which have now commenced delivery[5], has seen the average for planning to delivery periods lengthening.

A similar trend is apparent considering the 55 sites that delivered their first completions after 2007/08. These have significantly longer planning to delivery periods than those where completions began prior to the recession. The precise reasons are not clear, but is perhaps to be expected given the slowdown in housing delivery during the recession, and the significant reductions in local authority planning resources which are necessary to support discharge of pre-commencement conditions. However, delays may lie outside the planning system; for example, delays in securing necessary technical approvals from other bodies and agencies, or market conditions.

Sites that delivered their first completion during or after the 2007/08 recession have significantly longer planning to delivery periods than sites which began before.

Figure 5: Planning to delivery period, total average, pre and post-2008



Source: Lichfeilds analysis

Figure 5: Five of the large sites examples do not have a first dwelling completion recorded in this research

[5] Priors Hall has been amended since the first edition based on more recent data

In demand: how quickly do high pressure areas determine strategic applications for housing?

Using industry-standard affordability ratios, we found that areas with the least affordable places to purchase a home (i.e. the highest affordability ratios) tended to have longer planning to delivery times than areas that were more affordable. This is shown in Figure 6, which splits the large site sample into national affordability quartiles, with the national average equating to 8.72.

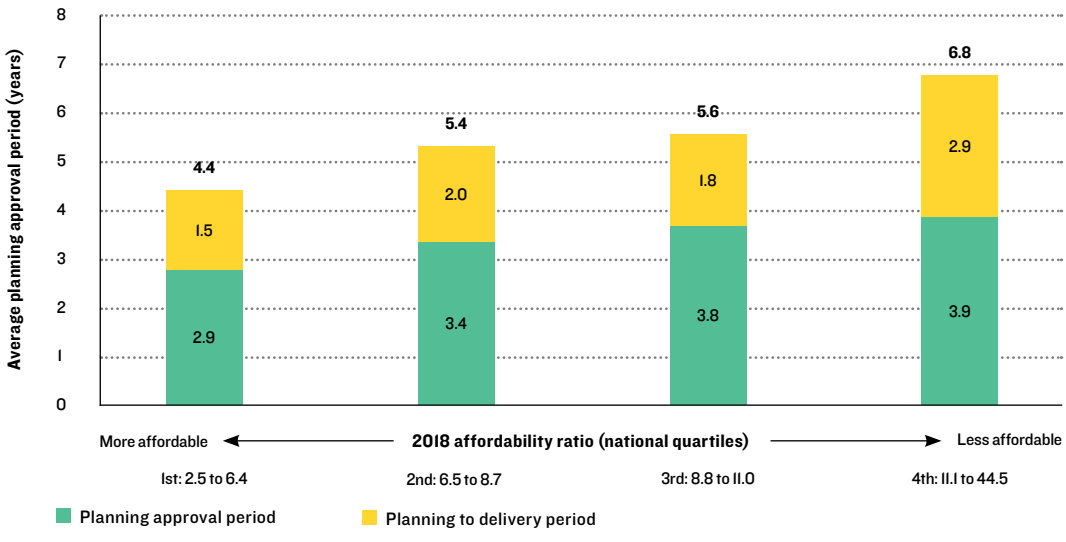
The above analysis coincides with the fact (Table 2) that sites in the most affordable locations (lowest quartile) tend to be smaller than those in less affordable locations (an average site size of c.1,150 compared to in excess of 2,000 dwellings for the three other quartiles). Even the least affordable LPAs (with the greatest gap between workplace earnings and house prices) have examples of large schemes with an average site size of 2,000+ dwellings. It may be that the more affordable markets do not support the scale of up-front infrastructure investment that is required for larger-scale developments and which lead to longer periods before new homes can be built. However, looking at the other three quartiles, the analysis does also suggest that planning and implementation becomes more challenging in less affordable locations.

Table 2: Site size by 2018 affordability ratio

Affordability ratio (workplace based)	Average site size
2.5 – 6.4	1,149
6.5 – 8.7	2,215
8.8 – 11.0	2,170
11.1 – 44.5	2,079

Source: Lichfields analysis

Figure 6: Planning approval period (years) by 2018 affordability ratio



Source: Lichfields analysis

04
How quickly do sites build out?

The rate at which new homes are built on sites is still one of the most contested matters at local plan examinations and planning inquiries which address 5YHLS and housing supply trajectories. The first edition of this research provided a range of 'real world' examples to illustrate what a typical large-scale site delivers annually. The research showed that even when some schemes were able to achieve very high annual build-out rates in a particular year (the top five annual figures were between 419-620 dwellings per annum), this rate of delivery was not always sustained. Indeed, for schemes of 2,000 or more dwellings the average annual completion rate across the delivery period was 160 dwellings per annum.

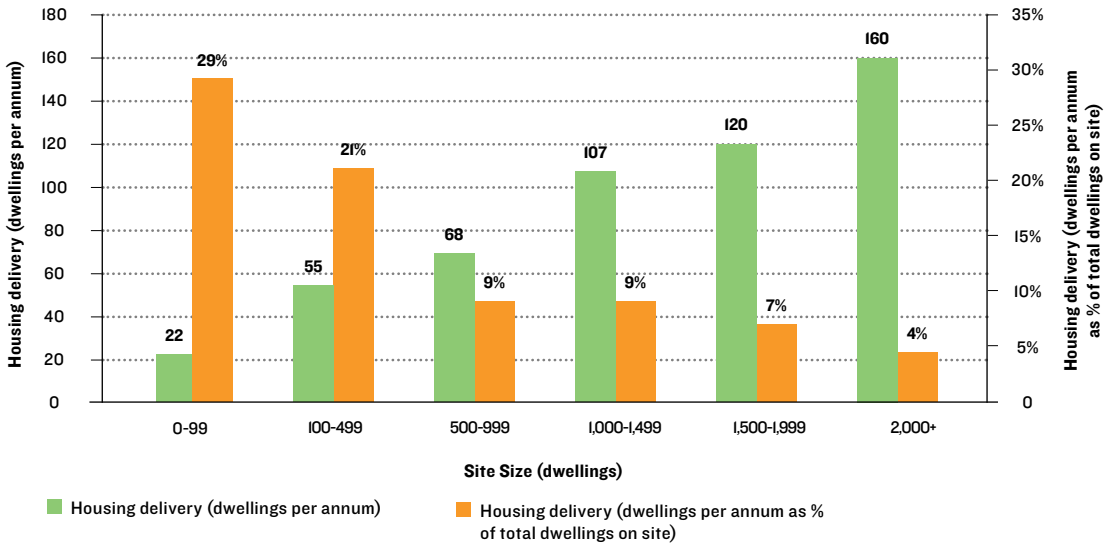
Average Annual Build-out rates

Figure 7 presents our updated results, with our additional 27 sites and the latest data for all sites considered. The analysis compares the size of site to its average annual build-out rate. Perhaps unsurprisingly, larger sites deliver on average more dwellings per year than smaller sites. The largest sites in our sample of over 2,000 dwellings, delivered on average more than twice as many dwellings per year than sites of 500-999 dwellings, which in turn delivered an average of three times as many units as sites of 1-99 units. To ensure the build-out rates averages are not unduly skewed, our analysis excludes any sites which have only just started delivering and have less than three years of data. This is because it is highly unlikely that the first annual completion figure would actually cover a whole monitoring year, and as such could distort the average when compared to only one other full year of delivery data.

160 dpa

the average annual build rate for schemes of 2,000+ dwellings

Figure 7: Build-out rate by size of site (dpa)



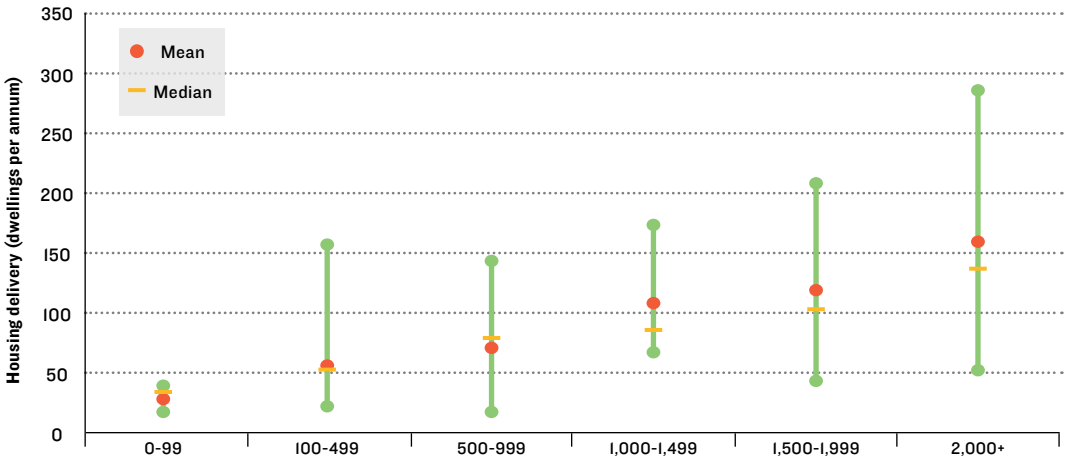
Source: Lichfields analysis

In most cases the median annual delivery rate is lower than the mean for larger sites.

We include the relevant percentage growth rates in this edition's analysis; this shows that the proportion of a site's total size that is build out each year reduces as site size increases.

Our use of averages refers to the arithmetic mean across the sample sites. In most cases the median of the rates seen on the larger sample sites is lower, as shown in Figure 8; this reflects the small number of sites which have higher delivery rates (the distribution is not equal around the average). The use of mean average in the analysis therefore already builds in a degree of optimism compared with the median or 'mid-point scheme'.

Figure 8: Minimum, mean, median and maximum build-out rates by size of site (dpa)



Source: Lichfields analysis

Table 3: Median and mean delivery rates by site size

Site Size	Number of sites	Median housing delivery (dwellings per annum)	Median delivery as % of total on site	Mean annual delivery (dwellings per annum)	Mean annual delivery as % of total units on site
0-99	29	27	33%	22	29%
100-499	54	54	24%	55	21%
500-999	24	73	9%	68	9%
1,000-1,499	17	88	8%	107	9%
1,500-1,999	9	104	7%	120	7%
2,000+	27	137	4%	160	4%

Source: Lichfields analysis

Comparison with our 2016 findings

Comparing these findings to those in the first edition of this research, there is very little difference between the averages observed (median was not presented) for different site sizes, as set out below. The largest difference is a decrease in average annual build-out rates for sites of 1,000-1,499 dwellings, but even then, this is only a reduction of 10 dpa or 9%.

As with the first edition of the research, these are averages and there are examples of sites which deliver significantly higher and lower than these averages, both overall and in individual years. Figure 8 shows the divergence from the average for different site size categories. This shows that whilst the average for the largest sites is 160 dpa and the median equivalent 137 dpa, the highest site average was 286 dpa and the lowest site average was 50 dpa for sites of 2,000+ dwellings. This shows the need for care in interpreting the findings of the research, there may well be specific factors that mean a specific site will build faster or slower than the average. We explore some of the factors later in this report.

Variations for individual schemes can be marked. For example, the 2,605 unit scheme South of the M4 in Wokingham delivered 419 homes in 2017/18, but this was more than double the completions in 2016/17 (174) and the average over all six years of delivery so far was just 147 dwellings per annum.

Even when sites have seen very high peak years of delivery, as Table 5 shows, no sites have been able to consistently delivery 300 dpa.

Site build-out rates for individual years are highly variable. For example, one scheme in Wokingham delivered more than twice as many homes in 2017/18 as it did in the year before.

Table 4: Mean delivery rates by site sizes, a comparison with first edition findings

Site size (dwellings)	2016 edition research (dpa)	2020 edition research (dpa)	Difference
0-99	27	22	-5 (-19%)
100-499	60	55	-5 (-8%)
500-999	70	68	-2 (-3%)
1,000-1,499	117	107	-10 (-9%)
1,500-1,999	129	120	-9 (-7%)
2,000+	161	160	-1 (-0.62%)

Source: Lichfields analysis

Table 5: Peak annual build-out rates compared against average annual delivery rates on those sites

Site	Site size (dwellings)	Peak annual build-out rate (dpa)	Average annual build-out rate (dpa)
Cambourne, South Cambridgeshire	4,343	620	223
Oakley Vale, Corby	3,100	520	180
Eastern Expansion Area, Milton Keynes	4,000	473	268
Clay Farm, Cambridge	2,169	467	260
South of M4, Wokingham	2,605	419	147
Cranbrook, East Devon	2,900	419	286

Source: Lichfields analysis

Table 5: Please note The Hamptons was included as an example of peak annual delivery in the first edition with one year reaching 520 completions. However, evidence for this figure is no longer available and as it was not possible to corroborate the figure it has been removed. The analysis has been updated to reflect the latest monitoring data from Peterborough City Council.

Longer term trends

This section considers the average build-out rates of sites which have been delivering over a long period of time. This is useful in terms of planning for housing trajectories in local plans when such trajectories may span an economic cycle.

In theory, sites of more than 2,000 dwellings will have the longest delivery periods. Therefore, to test long term averages we have calculated an average build-out rate for sites of 2,000+ dwellings that have ten years or more of completions data available.

For these sites, the average annual build-out rate is slightly higher than the average of all sites of that size (i.e. including those only part way through build out), at 165 dwellings per annum[6]. The median for these sites was also 165 dwellings per annum.

This indicates that higher rates of annual housing delivery on sites of this size are more likely to occur between years five and ten, i.e. after these sites have had time to 'ramp up'.

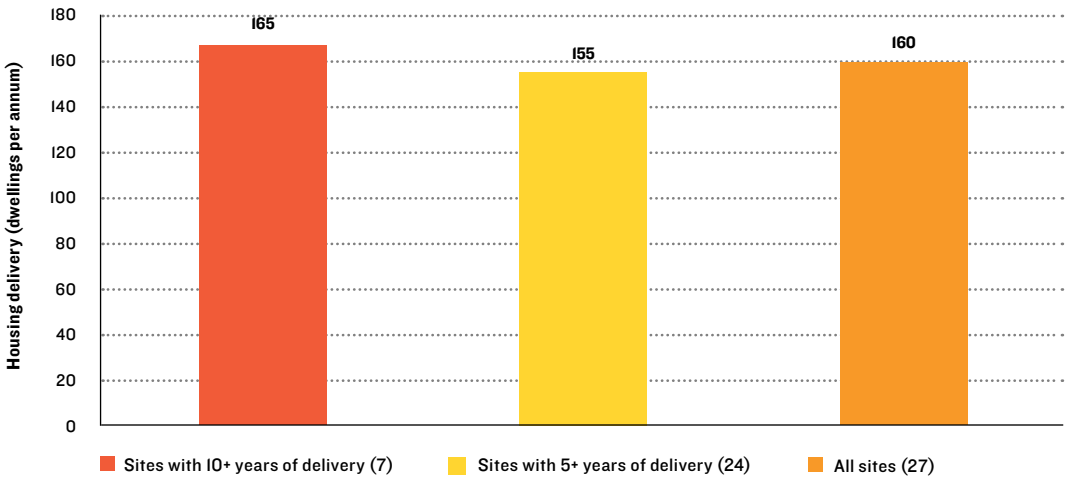
It might even relate to stages in delivery when multiple phases and therefore multiple outlets (including affordable housing) are operating at the same time. These factors are explored later in the report.

The impact of the recession on build-out rates

It is also helpful to consider the impact of market conditions on the build-out rate of large scale housing sites. Figure 10 overleaf shows the average delivery rate of sites of 2,000 or more dwellings in five-year tranches back to 1995/96. This shows that although annual build-out rates have improved slightly since the first half of the 2010's, they remain 37% below the rates of the early 2000's. The reasons for the difference are not clear and are worthy of further exploration – there could be wider market, industry structure, financial, planning or other factors at play.

In using evidence on rates of delivery for current/historic schemes, some planning authorities have suggested that one should adjust for the fact that rates of build out may have been affected by the impact of the recession. We have therefore considered how the average rates change with and without including the period of economic downturn (2008/09 – 2012/13). This is shown in Table 6 and it reveals that average build-out rates are only slightly depressed when one includes this period, but may not have fully recovered to their pre-recession peaks. We know that whilst the recession – with the crunch on mortgage

Figure 9: Average build-out rate for sites over 2,000 homes by length of delivery period (dpa)



Source: Lichfields analysis

[6] This is based on the completions of seven examples, Chapelford Urban Village, Broadlands, Kings Hill, Oakley Vale, Cambourne, The Hamptons and Wixhams

availability – did have a big impact and led to the flow of new sites slowing, there were mechanisms put in place to help sustain the build out of existing sites.

However, setting aside that stripping out the recession has a modest impact on the statistical averages for the sites in our sample, the more significant point is that – because of economic cycles - larger sites which build out over five or more years are inherently likely to coincide with a period of economic slowdown at some point during their build out. It therefore makes sense for housing trajectories for such sites to include an allowance for the prospect that, at some point, the rate of build out may slow due to a market downturn, albeit the effect may be smaller than one might suspect.

Table 6: Impact of recession on build-out rates

	All sites including recessionary period (2008/9-2012/13)		Excluding recession		Pre-recession only	
	Average rate	Sample size	Average rate	Sample size	Average rate	Sample size
All large sites 500+	115	77	126	68	130	21
All large sites 2,000+	160	27	171	25	242	6
Greenfield sites 2,000+	181	14	198	12	257	3

Source: Lichfields analysis

Figure 10: Average build-out rate by five year period for sites over (dpa)

Source: Lichfields analysis

05
What factors can influence build-out rates?

+34%

higher average annual build-out rates on greenfield land compared with brownfield

Having established some broad averages and how these have changed over time, we turn now to look at what factors might influence the speed at which individual sites build out. How does housing demand influence site build out? What is the impact of affordable housing? Does it matter whether the site is greenfield or brownfield? What about location and site configuration?

In demand: do homes get delivered faster in high pressure areas?

One theory regarding annual build-out rates is that the rate at which homes can be sold (the 'absorption rate') determines the build-out rate. This is likely to be driven by levels of market demand relative to supply for the product being supplied.

This analysis considers whether demand for housing at the local authority level affects delivery rates by using (industry-standard) affordability ratios. Higher demand areas are indicated by a higher ratio of house prices to earnings i.e. less affordable. Whilst this is a broad-brush measure, the affordability ratio is a key metric in the assessment of local housing need under the Government's standard methodology. Figure 11 shows the sample of 500+ unit schemes divided into those where the local authority in which they are located is above or below the national median affordability ratio (8.72) for sites which have delivered for three years or more. This analysis shows that sites in areas of higher demand (i.e. less affordable) deliver on average more dwellings per annum.

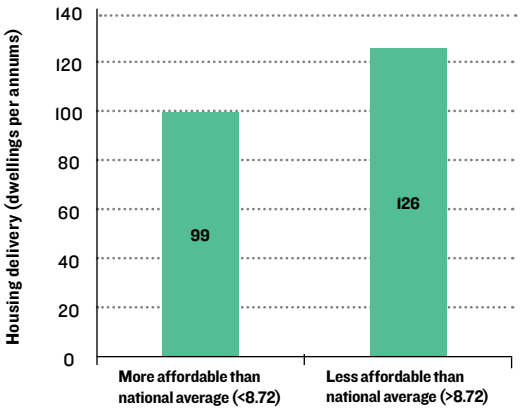
Our analysis also coincides with the fact that sites in less affordable areas are on average c.17% larger than those in more affordable areas. The average site size for schemes in areas where affordability is below the national average is 1,834 dwellings. For those delivered in areas where the affordability is greater than the national average, average site size is 2,145 dwellings. So, it is possible that the size of site – rather than affordability *per se* – is a factor here.

Do sites on greenfield land deliver more quickly?

The first edition of this research showed that greenfield sites on average delivered quicker than their brownfield counterparts. In our updated analysis this remains the case; large greenfield sites in our sample built out a third faster than large brownfield sites.

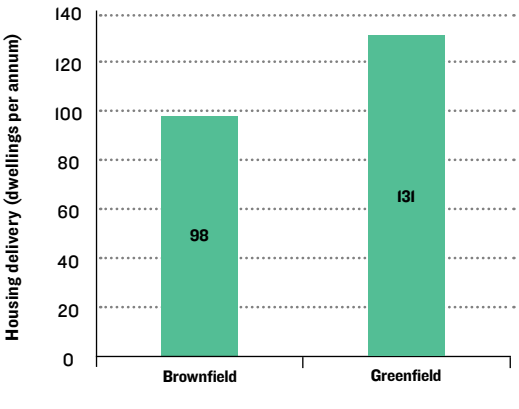
In the life cycle of a site, our data also shows that greenfield sites had shorter planning to delivery periods (2.0 years compared to 2.3 for brownfield sites), although on average, longer planning approval periods (5.1 years compared to 4.6 for brownfield sites).

Figure 11: Build-out rates by level of demand using national median 2018 workplace based affordability ratio (dpa)



Source: Lichfields analysis

Figure 12: Build-out rates on brownfield and greenfield sites (dpa)



Source: Lichfields analysis

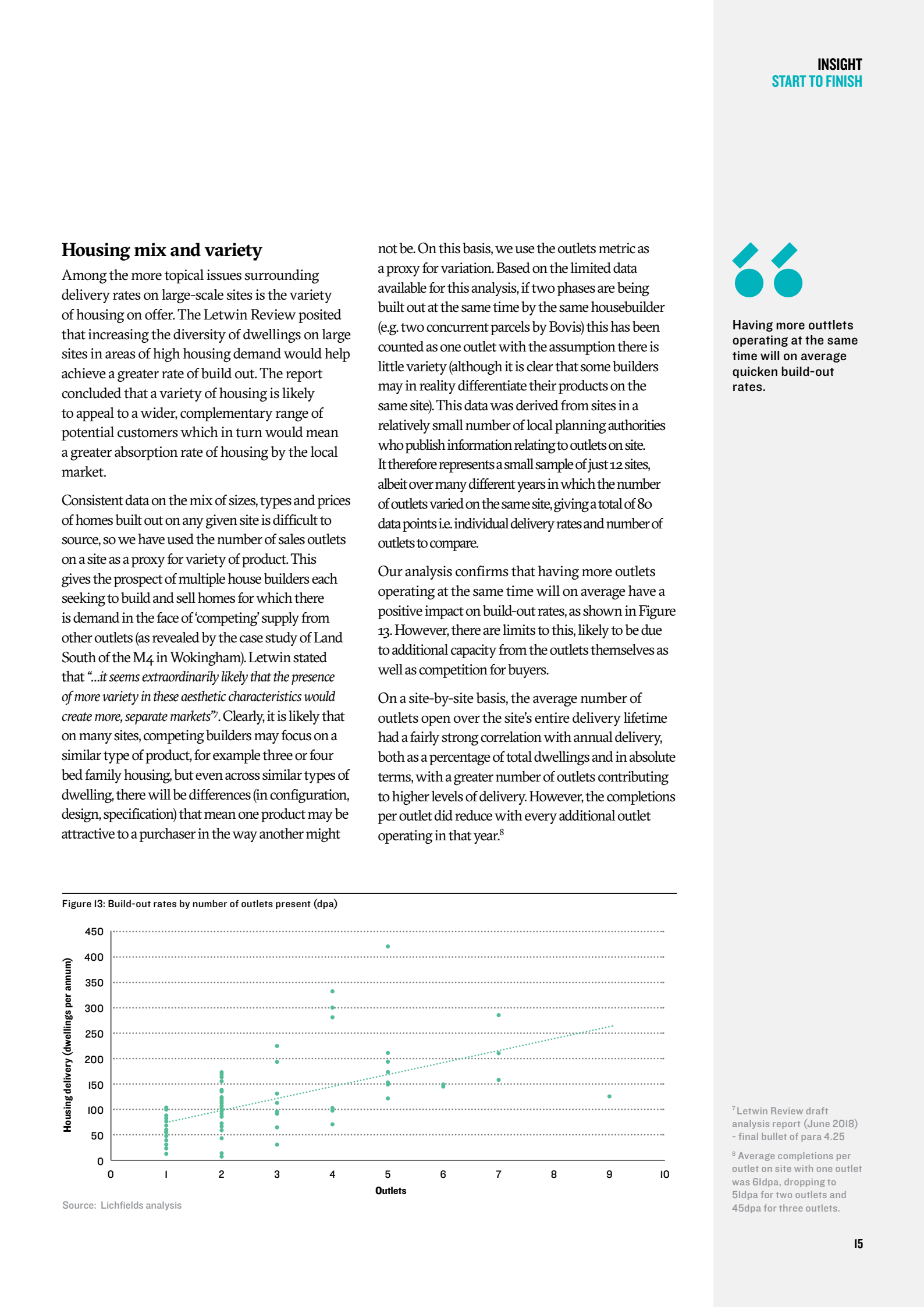
Housing mix and variety

Among the more topical issues surrounding delivery rates on large-scale sites is the variety of housing on offer. The Letwin Review posited that increasing the diversity of dwellings on large sites in areas of high housing demand would help achieve a greater rate of build out. The report concluded that a variety of housing is likely to appeal to a wider, complementary range of potential customers which in turn would mean a greater absorption rate of housing by the local market.

Consistent data on the mix of sizes, types and prices of homes built out on any given site is difficult to source, so we have used the number of sales outlets on a site as a proxy for variety of product. This gives the prospect of multiple house builders each seeking to build and sell homes for which there is demand in the face of 'competing' supply from other outlets (as revealed by the case study of Land South of the M4 in Wokingham). Letwin stated that *"...it seems extraordinarily likely that the presence of more variety in these aesthetic characteristics would create more, separate markets"*[7]. Clearly, it is likely that on many sites, competing builders may focus on a similar type of product, for example three or four bed family housing, but even across similar types of dwelling, there will be differences (in configuration, design, specification) that mean one product may be attractive to a purchaser in the way another might not be. On this basis, we use the outlets metric as a proxy for variation. Based on the limited data available for this analysis, if two phases are being built out at the same time by the same housebuilder (e.g. two concurrent parcels by Bovis) this has been counted as one outlet with the assumption there is little variety (although it is clear that some builders may in reality differentiate their products on the same site). This data was derived from sites in a relatively small number of local planning authorities who publish information relating to outlets on site. It therefore represents a small sample of just 12 sites, albeit over many different years in which the number of outlets varied on the same site, giving a total of 80 data points i.e. individual delivery rates and number of outlets to compare.

Our analysis confirms that having more outlets operating at the same time will on average have a positive impact on build-out rates, as shown in Figure 13. However, there are limits to this, likely to be due to additional capacity from the outlets themselves as well as competition for buyers.

On a site-by-site basis, the average number of outlets open over the site's entire delivery lifetime had a fairly strong correlation with annual delivery, both as a percentage of total dwellings and in absolute terms, with a greater number of outlets contributing to higher levels of delivery. However, the completions per outlet did reduce with every additional outlet operating in that year.[8]



Having more outtlets operating at the same time will on average quicken build-out rates.

Figure 13: Build-out rates by number of outlets present (dpa)

Source: Lichfields analysis

[7] Letwin Review draft analysis report (June 2018) - final bullet of para 4.25

[8] Average completions per outlet on site with one outlet was 61dpa, dropping to 51dpa for two outlets and 45dpa for three outlets.

Geography and Site Configuration

An under-explored aspect of large-scale site delivery is the physical opportunity on site. For example, some schemes lend themselves to simultaneous build out of phases which can have the impact of boosting delivery rates in that year, for example, by having access points from two alternative ends of the site. Other sites may be reliant on one key piece of infrastructure which make this opportunity less likely or impractical. In the first edition of this research we touched on this point in relation to Eastern Expansion Area (Broughton Gate & Brooklands) of Milton Keynes. As is widely recognised, the planning and delivery of housing in Milton Keynes is distinct from almost all the sites considered in this research as serviced parcels with the roads already provided were delivered as part of the Milton Keynes delivery model. Multiple house builders were able to proceed straight onto the site and commence delivery on different serviced parcels, with monitoring data from Milton Keynes Council suggesting an average of c.12 parcels were active across the build period. In this second edition of this research the Milton Keynes examples remain some of the sites with the highest annual build-out rates.

Table 7: Parcels at Land South of M4, Wokingham

Parcel reference	Developers (active outlets)	Completions in 2017/18
SP1	Bellway (1)	59
SP2w	Bellway and Bovis (-)	None - parcel completed
SP3	Crest Nicholson (1)	47
SP4	Taylor Wimpey and David Wilson Homes (2)	140
SP9_1	Bloor, Bovis and Linden (3)	169
SP10	Darcliffe Homes (-)	None - parcel completed
SP11	Taylor Wimpey (1)	4

Source: Lichfields analysis

Figure 14: Map of parcels at Land South of M4, Wokingham

Source: © Google Earth 2020/ Wokingham Local Plan

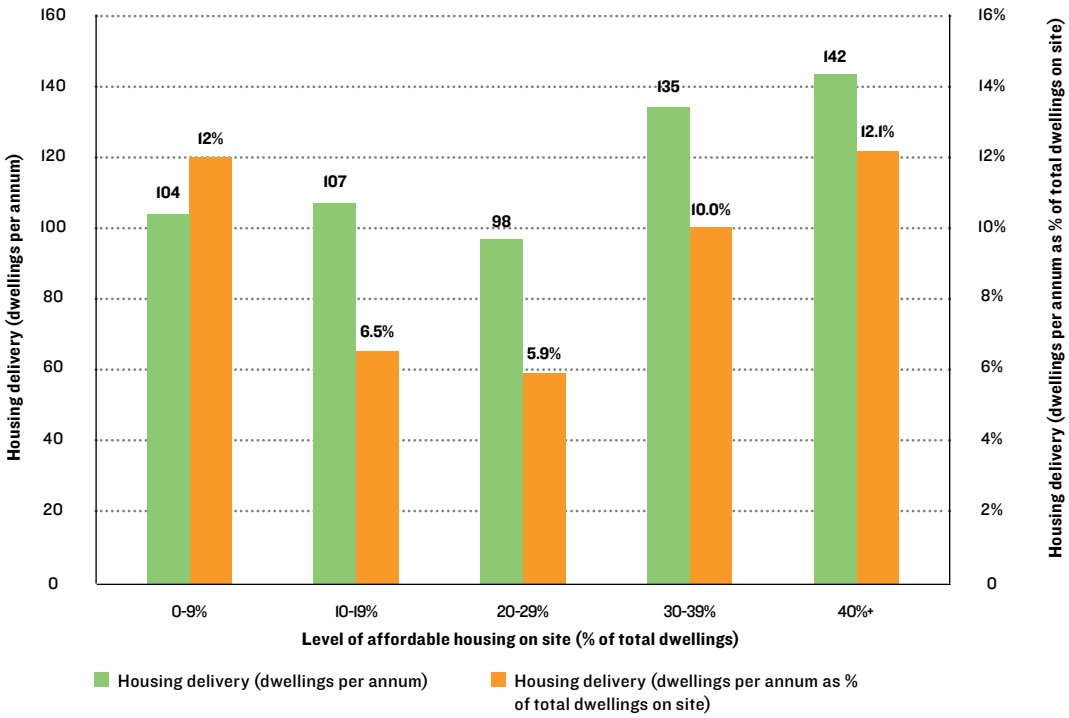
In this edition we look at the case study of Land South of the M4 in Wokingham. In 2017/18 the site achieved a significant 419 completions. Using the local authority's granular recording of delivery on the site to date, we have been able to consider where these completions were coming forward from within the wider 2,605 dwelling scheme. As shown in Figure 14, in that year new homes were completed on five separate parcels with completions ranging from 4 to 169 dwellings. On some of these parcels (SP9_1 and SP4) there were two or three separate housebuilders building out, and in total on the site there were seven different house building companies active (the impact of multiple outlets on build-out rates is explored later in this report). The parcels are located in separate parts of the site and each had their own road frontages and access arrangements which meant they are able to come forward in parallel. This can enable an increased build rate.

Affordable choices: do different tenures provide more demand?

Our findings on tenure, another form of 'variety' in terms of house building products, are informed by data that is available on about half the sites in our large site sample. From this the analysis shows schemes with more affordable housing built out at close to twice the rate as those with lower levels of affordable housing as a percentage of all dwellings on site. However this is not always the case. Schemes with 20-29% affordable housing had the lowest build-out rates, both in terms of dwellings and proportionate to their size.

Schemes with more affordable housing built out at close to twice the rates as those with lower levels.

Figure 15: Build-out rates by level of affordable housing (dpa and percentage)



Source: Lichfields analysis

06
Conclusions

Recent changes to national planning policy emphasise the importance of having a realistic expectation of delivery on large-scale housing sites, whilst local authorities now find themselves subject to both forward and backward-looking housing delivery performance measures. A number of local plans have hit troubles because they over-estimated the yield from some of their proposed allocations. Meanwhile, it is no longer sufficient for a 5YHLS to look good on paper; the Housing Delivery Test means there are consequences if it fails to convert into homes built.

To ensure local authorities are prepared for these tests, plan making and the work involved in maintaining housing land supply must be driven by realistic and flexible housing trajectories, based on evidence and the specific characteristics of individual sites and local markets. For local authorities to deliver housing in a manner which is truly plan-led, this is likely to mean allocating more sites rather than less, with a good mix of types and sizes, and being realistic about how fast they will deliver so supply is maintained throughout the plan period. Equally, recognising the ambition and benefits of more rapid build out on large sites, it may mean a greater focus on how such sites are developed.

Our research provides those in the public and private sector with a series of real-world benchmarks in this complex area of planning for large scale housing, which can be particularly helpful in locations where there is little recent experience of such strategic developments. Whilst we present some statistical averages, the real relevance of our findings is that there are likely to be many factors which affect lead-in times and build-out rates, and that these - alongside the characteristics of individual sites - need to be considered carefully by local authorities relying on large sites to deliver planned housing.

In too many local plans and 5YHLS cases, there is insufficient evidence for how large sites are treated in housing trajectories. This research seeks to fill the gap with some benchmark figures - which can be of some assistance where there is limited or no local evidence. But the average derived from our analysis are not intended to be definitive and are no alternative to having a robust, bottom-up justification for the delivery trajectory of any given site. It is clear from our analysis that some sites start and deliver more quickly than the average, whilst others have delivered much more slowly. Every site is different. Therefore, whilst the averages observed in this research may be a good starting point, there are a number of key questions to consider when estimating delivery on large housing sites, based around the three key elements in the three-tier analytical framework at Figure 16.

Key findings:

1 Large schemes can take 5+ years to start

In developing a local plan, but especially in calculating a 5YHLS position, it is important to factor in a realistic planning approval period dependent on the size of the site. Our research shows that if a scheme of more than 500 dwellings has an outline permission, then the average time to deliver its first home is two or three years. However, from the date at which an outline application is validated it can be 5.0 - 8.4 years for the first home to be delivered dependent on the size of the site. In these circumstances, such sites would make no contribution to completions in the first five years.

2 Lead-in times jumped post-recession

Whilst attention and evidence gathering is often focused on how long it takes to get planning permission, the planning to delivery period from gaining permission to building the first house has also been increasing. Our research shows that the planning to delivery period for large sites completed since 2007/08 has jumped compared to those where the first completion came before 2007/08. This is a key area where improvements could be sought on timeliness and in streamlining pre-commencement conditions, but is also likely impacted by a number of macro factors including the recession and reductions in local authority planning resources.

3 Large greenfield sites deliver quicker

Large sites can deliver more homes per year over a longer time period, with this seeming to ramp up beyond year five of the development on sites of 2,000+ units. However, on average these longer-term sites also have longer lead-in times. Therefore, short term boosts in supply, where needed, are likely to also require a good mix of smaller sites. Furthermore, large scale greenfield sites deliver at a quicker rate than their brownfield equivalents: the average rate of build out for greenfield sites in our sample was 34% greater than the equivalent figure for those on brownfield land. In most locations, a good mix of types of site will therefore be required.

4 Outlets and tenure matter

Our analysis suggests that having additional outlets on site has a positive impact on build out rates, although there is not a linear relationship. Interestingly, we also found that schemes with more affordable housing (more than 30%) built out at close to twice the rate as those with lower levels of affordable housing as a percentage of all units on site, but those with 20-29% had the lowest rates of all. Local plans should reflect that – where viable – higher rates of affordable housing supports greater rates of delivery. This principle is also likely to apply to other sectors that complement market housing for sale, such as build to rent and self-build (where there is demand).

Figure I6: Key questions for assessing large site build-out rates and delivery timelines

Planning Approval

- Is the site already allocated for development? If it is in an emerging Plan, does it need to be adopted before the site can be brought forward?
- Is an SPD, masterplan or development brief required and will it help resolve key planning issues?
- Is there an extant planning permission or live planning application submitted?
- If outline permission is granted, when will reserved matters be submitted?
- Is the proposal of the promoter consistent with local policy and/or SPD/Masterplan?
- Are there significant objections to the proposal from local residents?
- Are there material objections to the proposal from statutory bodies?
- If planning permission is secured, is reserved matters approval required?

Lead In

- Does the scheme have pre-commencement conditions?
- Is the land in existing use?
- Has the land been fully assembled?
- Are there any known technical constraints that need to be resolved?
- If in multiple ownership/control, are the interests of all parties aligned?
- Is there up-front infrastructure required before new homes can be built?
- Has the viability of the proposal been established and is the feasibility consistent with known infrastructure costs and the likely rate of development?
- Does the proposal rely on access to public resources and what evidence is there on when those will be available?
- Is the scheme led by a promoter or master developer who will need to dispose of phases to a house builder before completions begin?

Build Out

- How large is the site?
- How strong is the local market?
- Does the site tap into local demand from one or more existing neighbourhoods?
- Will delivery be affected by competing sites?
- How many sales outlets will be supported by the scale, configuration and delivery model for the site?
- What is the track record of the promoter/master developer in delivery of comparable sites?
- How active are different housebuilders in the local market?
- What proportion of affordable housing is being delivered?
- Are there policy requirements for a specific mix of housing types and are there other forms of housing – such as build to rent?
- When will new infrastructure – such as schools – be provided to support the new community?
- Are there trigger points or phasing issues that may affect the build-out rate achievable in different phases?

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Appendix 1: Definitions and notes

The 'lead in'

Measures the period up to first completion of a house on site from the validation date of the first planning application made for the scheme. The lead-in time covers both the planning approval period and planning to delivery periods set out below. The lead-in time does also include the date of the first formal identification of the site as a potential housing allocation (e.g. in a LPA policy document), but consistent data on this for the sample is not available.

The 'planning period'

Measured from the validation date of the first application for the proposed development (be that an outline, full or hybrid application). The end date is the decision date of the first detailed application which permits the development of dwellings on site (this may be a full or hybrid application or the first reserved matters approval which includes details for housing). A measurement based on a detailed 'consent' was considered reasonable and proportionate milestone for 'planning' in the context of this research.

The 'planning to delivery period'

Includes the discharge of any pre-commencement and any opening up works required to deliver the site. It finishes on completion of the first dwelling.

The date of the 'first housing completion'

On site (the month and year) is used where the data is available. However, in most instances the monitoring year of the first completion is all that is available and in these cases a mid-point of the monitoring period (1st October, falling halfway between 1st April and the following 31st March) is used.

The 'annual build-out rate'

Each site is taken or inferred from a number of sources. This includes Annual Monitoring Reports (AMR's) and other planning evidence base documents produced by local authorities (see footnote 1), contacting the local planning authority monitoring officers or planners and in a handful of instances obtaining the information from housebuilders.

Due to the varying ages of the assessed sites, the implementation of some schemes was more advanced than others and, as a function of the desk-based nature of the research and the age of some of the sites assessed, there have been some data limitations, which means there is not a complete data set for every assessed site. For example, lead-in time information prior to submission of planning applications is not available for the vast majority of sites. And because not all of the sites assessed have commenced housing delivery, build-out rate information is not universal. The results are presented accordingly.

Appendix 2: Large sites tables

Site name	Local Planning Authority	Site size	Year of first housing completion	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22
				Dwellings per annum																					
Ebbsfleet	Gravesham/ Dartford	15,000	2009/10	127	79	55	50	44	40	60	141	312													
The Hamptons	Peterborough	6,320	1997/98	290.3	290.3	290.3	290.3	290.3	290.3	290.3	290.3	290.3	290.3	290.3	224	224	154	157	71	67	101	34	54	100	
Rugby Radio Station	Rugby	6,200	N/A																						
East of Kettering	Kettering	5,500	2016/17	43	93																				
Sherford	Plymouth	5,500	2016/17	7	106																				
Priors Hall	Corby	5,200	2011/12	56	21	59	87	170	155	273															
Wichelstowe	Swindon	4,500	2008/09	158	93	195	64	100	61	44	60	57													
Monkton Heathfield	Taunton Deane	4,500	2012/13	22	76	220	191	222	148																
The Wixams	Bedford	4,500	2008/09	8	190	160	138	113	109	109	44	37	47												
Cambourne	South Cambridgeshire	4,343	1999/2000	42	361	213	337	620	151	377	267	219	190	162	206	154	151	129	239	201	95	126			
Eastern Expansion Area (Broughton Gate & Brooklands)	Milton Keynes	4,000	2008/09	154	359	371	114	473	138																
Locking Parklands	North Somerset	3,700	2011/12	23	45	97	75	10	21	86															
Stanton Cross	Wellingborough	3,650	N/A																						
Beaulieu Park	Chelmsford	3,600	2015/16	40	110	262																			
Northampton North SUE	Daventry	3,500	2017/18	50																					
Great Western Park	South Oxfordshire	3,300	2011/12	110	204	232	392	237	274	78															
Oakley Vale	Corby	3,100	2001/02	35	89	289	258	346	487	520	233	174	159	107	96	103	51	40	9	70					
Kings Hill	Tonbridge and Malling	3,024	1996/97	140	140	140	140	140	126	219	104	237	166	281	300	224	93	55	90	84	108	91	74	41	31
North West Cambridge	Cambridge and South Cambridgeshire	3,000	2016/17	73																					
West of Waterloo	Havant and Winchester	3,000	2009/10	38	71	30	82	112	135	196	241														
Cranbrook	East Devon	2,900	2012/13	187	419	356	299	214	241																
West of Kempston	Bedford	2,760	2010/11	52	102	144	167	124	175	103	93														
South of the M4	Wokingham	2,605	2012/13	37	175	56	29	166	419																
Winterstoke Village	North Somerset	2,550	2014/15	132	185	242	161																		
Emersons Green East	South Gloucestershire	2,550	2014/15	274	197	318	280																		

Site name	Local Planning Authority	Site size	Year of first housing completion	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22
				Dwellings per annum																					
Land East Icknield Way	Test Valley	2,500	2009/10	184	257	103	181	135	229	146	184														
South Wokingham	Wokingham	2,490	2013/14	6	104	120	135	118																	
North Wokingham	Wokingham	2,391	2010/11	28	99	23	0	95	112	66	154														
Broadlands	Bridgend	2,309	1999/2000	288	331	307	193	204	156	64	104	91	28	81	50	147	11								
Western Riverside	Bath and North East Somerset	2,281	2011/12	59	147	93	61	163	154	45															
Arborfield Garrison	Wokingham	2,225	2016/17	57	114																				
Charlton Hayes, Northfield	South Gloucestershire	2,200	2010/11	83	87	163	333	281	193	301	168														
Clay Farm/ Showground Site (Great Kneighton)	Cambridge	2,169	2012/13	16	265	399	153	467																	
Chapelford Urban Village	Warrington	2,144	2004/05	211	214	166	262	224	141	180	183	247	60	160	66	30									
Ledsham Garden Village	Cheshire West and Chester	2,000	2016/17	41	90																				
Graven Hill	Cherwell	1,900	2016/17	1	28																				
Elvetham Heath	Hart	1,869	2000/01	192	300	297	307	287	238	103	139	6													
Hunts Grove	Stroud	1,750	2010/11	2	87	106	80	58	7	2	22														
Dickens Heath	Solihull	1,672	1997/98	2	179	196	191	207	88	124	64	249	174	16	96	110	4	0	0	13	10	26	12	96	
Red Lodge	Forest Heath	1,667	2004/05	65	93	181	79	57	79	61	101	213	101	78	23	75	111								
South West Bicester (Phase 1 Kingsmere)	Cherwell	1,631	2011/12	40	107	133	179	210	231	196															
Centenary Quay	Southampton	1,620	2011/12	102	58	103	137	257	8																
Northumberland Park	North Tyneside	1,513	2003/04	54	194	171	93	179	100	69	117	96	53	82	64	86									
Parc Derwen	Bridgend	1,500	2010/11	8	103	134	201	199	197	157	186														
Jennet's Park	Bracknell Forest	1,500	2007/08	153	154	145	168	136	179	235	93	37	0	28											
Melton Road	Rushcliffe	1,500	2016/17	40	126																				
Great Denham	Bedford	1,450	data only avalibale from 2009/10	92	150	159	71	122	150	125	211	168													
Love's Farm, St Neots	Huntingdonshire	1,438	2007/08	34	186	336	302	216	60	108	59	85													
South Maldon Garden Suburb	Malden	1,428	2017/18	1																					

Site name	Local Planning Authority	Site size	Year of first housing completion	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22
				Dwellings per annum																					
Bolnore Village	Mid Sussex	1,358	2012/13	30	54	88	73	36	124																
Park Prewett Hospital	Basingstoke and Deane	1,341	1998/99	58	82	37	102	0	0	0	0	0	307	214	219	146	33	34	56	7	30	16			
Ashford Barracks (Repton Park)	Ashford	1,300	2005/06	83	0	124	14	64	58	155	103	49	70	67	138	90									
Oxley Park (East & West)	Milton Keynes	1,300	2004/05	52	166	295	202	115	91	75	163														
Kempshott Park	Basingstoke and Deane	1,252	2000/01	78	310	229	213	281	84	33	24														
Holborough Quarry	Tonbridge and Malling	1,211	2006/07	85	137	91	47	18	100	59	12	43	64	60	101										
Staynor Hall	Selby	1,200	2005/06	12	141	115	10	43	62	46	59	79	162	79	34	50									
Picket Twenty	Test Valley	1,200	2011/12	147	178	180	176	164	145	175															
Trumpington Meadows	Cambridge and South Cambridgeshire	1,200	2012/13	141	143	67	100	94																	
Broughton (Broughton & Atterbury)	Milton Keynes	1,200	2003/04	114	105	170	409	204	180	18															
Orchard Park	Cambridge	1,120	2006/07	100	290	148	103	95	56	34	15	75	39	30	2										
Velmead Farm	Hart	1,112	1989/90	1	104	193	89	101	52	101	113	130	74	102	48	4									
Cheeseman's Green (Finberry)	Ashford	1,100	2014/15	59	47	102	157																		
Zones 3 to 6, Omega South	Warrington	1,100	2017/18	15																					
Boulton moor	South Derbyshire	1,058	2014/15	22	96	96	116																		
Highfields Farm	South Derbyshire	1,056	2016/17	141	204																				
Monksmoor Farm	Daventry	1,000	2013/14	6	65	98	128	122																	
Northampton North of Whitehills SUE	Daventry	1,000	2016/17	108	100																				
Taylors Farm/Sherfield Park	Basingstoke and Deane	991	2004/05	56	79	81	86	88	51	143	141	88	91	75	0	12									
Queen Elizabeth II Barracks	Hart	972	2012/13	56	165	110	228	213	96																
Little Staniton	Corby	970	2009/10	106	116	74	121	102	93	89	86	26													
North of Popley	Basingstoke and Deane	951	2007/08	65	57	16	28	0	0	15	118	84	60												
Ingress Park	Dartford	950	2002/03	184		275	100	74	0	119	0	0													
Nar Ouse Millenium Commuity	Kings Lynn and West Norfolk	900	2007/08	32	77	0	0	0	0	30	22.5	22.5	68	0											
West Park	Darlington	893	2004/05	60	104	98	66	69	19	35	10	16	51	35	28	14	42								
South Bradwell	Great Yarmouth	850	2015/16	60.3	60.3	60.3																			

Site name	Local Planning Authority	Site size	Year of first housing completion	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22
				Dwellings per annum																					
Prospect Place	Cardiff	826	2007/08	185	48	0	0	0	0	0	76	170													
Abbotswood	Test Valley	800	2011/12	30	190	157	114	152	90	20															
Dowds Farm	Eastleigh	795	2006/07	54	189	187	44	102	47	66	76		30												
Land at Popley Fields/ Marnell Park	Basingstoke and Deane	751	2006/07	105	172	118	186	126	44																
Hungate	York	720	2009/10	90	52	11	9	7			187	8													
Northside	Gateshead	718	1999/2000	46.8	46.8	46.8	46.8	46.8	56	46.8	46.8	46.8	46.8	46.8	16	30	31	33	25	43					
Land at West Blyth	Northumbeland	705	2008/09	6.25	6.25	6.25	6.25	32	66	51	127	78	90												
Rowner Renewal Project	Gosport	700	2010/11	4	100	70	45	89	101	79	97														
Channels - North Chelmsford	Chelmsford	700	2015/16	31	172	110																			
The Parks, formally Staff College	Bracknell Forest	697	2006/07	-94	104	88	101	54	47	72	59	94	78												
Staiths South Bank	Gateshead	667	2003/04	24	58		44		48																
Land south of Wansbeck General Hospital	Northumberland	644	2005/06	18.7	18.7	18.7	18.7	18.7	18.7	18.7	17	24	37	60	57	54									
Former Pontins Holiday Camp	Lancaster	626	2006/07	16	22	4	5																		
Ochre Yards	Gateshead	606	2004/05	83	68.2	68.2	68.2	68.2	68.2			46	4	52	2										
Former Runwell Hospital	Chelmsford	575	2016/17	91	90																				
Land adjoining Manchester Ship Canal	Trafford	550	N/A																						
Pamona Docks	Trafford	546	N/A																						
Thingwall Lane	Knowlsey	525	2013/14	79																					
St. James Village	Gateshead	518	2000/01	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	14	13	18	15								
University Campus Chelmsford	Chelmsford	507	2014/15	216	3																				
Land at Siston Hill	South Gloucestershire	504	2006/07	77	211	96	63	57																	
Land West of Copthorne	Mid Sussex	500	N/A																						

Sources for sites also found in the Letwin Review

Arborfield Green (Arborfield Garrison)		Five Year Housing Land Supply Statement and appendix on Strategic Development Locations at 31st March 2018 published 9th October 2018 http://www.wokingham.gov.uk/planning-policy/planning-policy-information/evidence-topics/
Ledsham Garden Village		Various Housing Land Monitor Reports https://consult.cheshirewestandchester.gov.uk/portal/cwc_ldf/mon/
Great Kneighton (Clay Farm)		Partly provided by Cambridgeshire County Council and included in numerous AMR's https://www.cambridge.gov.uk/annual-monitoring-reports
Trumpington Meadows		Included in numerous AMR's for Cambridge and South Cambridgeshire (site crosses boundaries) https://www.cambridge.gov.uk/annual-monitoring-reports and https://www.scambs.gov.uk/planning/local-plan-and-neighbourhood-planning/annual-monitoring-report/
Graven Hill		Various Annual monitoring reports https://www.cherwell.gov.uk/info/33/planning-policy/370/monitoring-reports
South West Bicester (Kingsmere Phase I)		Various Annual monitoring reports https://www.cherwell.gov.uk/info/33/planning-policy/370/monitoring-reports
Great Western Park		Housing Land Supply Statement April 2018 http://www.southoxon.gov.uk/sites/default/files/30.04.2018%20Housing%20Land%20Supply%20Statement%20FINAL%20(2)%20combined.pdf
Ebbsfleet:		First phase at Springhead Park and Northfleet South from Gravesham AMR's 2009/10 to 2012/13
	2009-10:	127 completions https://www.gravesham.gov.uk/__data/assets/pdf_file/0010/69823/AMR2010.pdf
	2010-11:	79 completions https://www.gravesham.gov.uk/__data/assets/pdf_file/0010/69814/AMR2011.pdf
	2011-12:	55 completions https://www.gravesham.gov.uk/__data/assets/pdf_file/0009/92448/Gravesham-Authority-Monitoring-Report-2011-12-May-2013.pdf
	2012-13:	50 completions https://www.gravesham.gov.uk/__data/assets/pdf_file/0010/92449/Gravesham-Authority-Monitoring-Report-2012-13-interim-May-2013.pdf
	2013/14:	87 dwellings, based on total completions form Gravesham to 2012/13 of 311 and total completions to the start of 2014/15 in the Ebbsfleet Garden City Latest Starts and Completion Figures totalling 398.
	2014/15 to 2017/18:	Ebbsfleet Garden City Latest Starts and Completion Figures: https://ebbsfleetdc.org.uk/tracking-our-performance/

Appendix 3: Small sites tables

Site Name	Local Planning Authority	Size
Cookridge Hospital	Leeds	495
Stenson Fields	South Derbyshire	487
Horfield Estate Phase I	Bristol City Council	485
Farnborough Business Park	Rushmoor	476
Bickershaw Colliery	Wigan	471
Farington Park, east of Wheelton Lane	South Ribble	468
Bleach Green	Gateshead	456
Kingsmead South	Milton Keynes Council	450
New Central	Woking Borough Council	445
Land at former Battle Hospital	Reading Borough Council	434
New World House	Warrington	426
Radyr Sidings	Cardiff	421
Luneside West	Lancaster	403
Woolley Edge Park	Wakefield	375
Former Masons Cerement Works and Adjoining Ministry of Defence Land	Mid Suffolk	365
Former NCB Workshops (Portland Park)	Northumberland	357
Chatham Street Car Park Complex	Reading	307
Kennet Island Phase I - H, M, T, UI, U2	Reading	303
Land at Dorian Road	Bristol, City of	300
Land at Fire Service College, London Road	Cotswold	299
Land at Badsey Road	Wychavon	298
Land at Brookwood Farm	Woking	297
Long Marston Storage Depot Phase I	Stratford-on-Avon	284
M & G Sports Ground, Golden Yolk and Middle Farm	Tewkesbury	273
Land at Canons Marsh	Bristol, City of	272
Land off Henthorn Road	Ribble Valley	270
Land Between A419 And A417	Cotswold	270
Hortham Hospital	South Gloucestershire	270
GCHQ Oakley - Phase I	Cheltenham	262
Hewlett Packard (Land Adjacent To Romney House)	Bristol, City of	242
128-134 Bridge Road And Nos 1 - 4 Oldfield Road	Windsor and Maidenhead	242
Hoval Ltd North Gate	Newark and Sherwood	196
Notcutts Nursery, 150 - 152 London Road	Cherwell	182
Sellars Farm	Stroud	176
Land South of Inervet Campus Off Brickhill Street, Walton, Milton Keynes	Milton Keynes	176
Queen Mary School	Fylde	169
London Road/ Adj. St Francis Close	East Hertfordshire	149
Land off Gallamore Lane	West Lindsey	149
Doxey Road	Stafford	145
Former York Trailers (two schemes - one Barratt, one DWH)	Hambleton	145
Bracken Park, Land At Corringham Road	West Lindsey	141
Land at Farnham Hospital	Waverley	134
North of Douglas Road	South Gloucestershire	131
Land to the east of Efflinch Lane	East Staffordshire	130
Land to the rear of Mount Pleasant	Cheshire West and Chester	127
Primrose Mill Site	Ribble Valley	126
Kennet Island Phase IB - E, F, O & Q	Reading	125
Land between Godsey Lane and Towngate East	South Kesteven	120
Bibby Scientific Ltd	Stafford	120
Land west of Birchwood Road	Bristol, City of	119
Former Bewbush Leisure Centre Site	Crawley	112
Land south of Station Road	East Hertfordshire	111
Poppy Meadow	Stratford-on-Avon	106
Weeton Road/Fleetwood Road	Fylde	106
Former York Trailers (two schemes - one Barratt, one DWH)	Hambleton	96
North East Sandylands	South Lakeland	94
Auction Mart	South Lakeland	94
Parcel 4 Gloucester Business Park	Tewkesbury	94
York Road	Hambleton	93
Land At Green Road - Reading College	Reading	93
Caistor Road	West Lindsey	89
The Kylins	Northumberland	88
North East Area Professional Centre, Furnace Drive	Crawley	76
Land at Willoughbys Bank	Northumberland	76
Watermead, Land At Kennel Lane	Tewkesbury	72
Land to the North of Walk Mill Drive	Wychavon	71
Hawthorn Croft (Off Hawthorn Avenue Old Slaughterhouse Site)	West Lindsey	69
Land off Crown Lane	Wychavon	68
Former Wensleydale School	Northumberland	68
Land at Lintham Drive	South Gloucestershire	68
Springfield Road	South Kesteven	67
Land off Cirencester Rd	Stroud	66
Land south of Pinchington Lane	West Berkshire	64
Land at Prudhoe Hospital	Northumberland	60
Oxfordshire County Council Highways Depot	Cherwell	60
Clewborough House School	Cherwell	60
Land at the Beacon, Tilford Road	Waverley	59
Land to Rear Of 28 - 34 Bedale Road	Hambleton	59
Hanwell Fields Development	Cherwell	59
Fenton Grange	Northumberland	54
Former Downend Lower School	South Gloucestershire	52
Holme Farm, Carleton Road	Wakefield	50
Land off Elizabeth Close	West Lindsey	50

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Appendix 21

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20th July 2021

Wisloe Action Group

By email only

Dear Wisloe Action Group

Re: Stroud Local Plan Review Sustainability Appraisal

As instructed, we have undertaken a detailed investigation of the Sustainability Appraisal (SA) of the Stroud District Local Plan Review following an initial review earlier this month.

Our initial review of the Stroud Local Plan Review SA identified potential non-compliance with the SEA Regulations within the SA report and in the SA process followed.

This letter reports our findings in relation to a more detailed review of the SA and provides information to support the representations being prepared in relation to the SA.

Reasonable Alternatives

The SEA Regulations require an environmental report to be prepared in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated (Regulation 12). Information to be provided in the Environmental Report includes "an outline of the reasons for selecting the alternatives dealt with" (Schedule 2).

In undertaking this exercise, we have referred to the following documents:

- Sustainability Appraisal Report for the Stroud District Local Plan Review – Pre-submission Draft Local Plan (LUC, May 2021);
- Sustainability Appraisal Findings for the Stroud Local Plan Review Additional Housing Options (LUC, October 2020);
- Sustainability Appraisal Report for the Stroud District Local Plan Review: Draft Plan (LUC, November 2019);

Sustainability Appraisal Report for the Stroud District Local Plan Review: Emerging Strategy Paper (LUC, November 2018);

- Sustainability Appraisal Scoping Report (LUC, April 2018);
- Stroud District Local Plan Review Pre-Submission Draft Plan 2021; and
- Stroud District Local Plan Issues and Options consultation document (SDC, 2017).

There have been a number of prominent court cases surrounding the issue of alternatives in SEA and compliance with the requirements of the Regulations (such as *City and District of St Albans v. Secretary of State for Communities and Local Government and Cala Homes (South) Limited v. Secretary of State for Communities and Local Government and, Heard v Broadland District Council*). Furthermore, planning best practice recommends providing clear and meaningful alternatives and a logical decision-making process in order to achieve a more sustainable plan outcome. We have reviewed the aspects of the SA of the Stroud Local Plan Review process covered by this case law to ensure that they have been undertaken in line with the judgements made. In particular, that all reasonable alternatives have been identified and assessed in the SA and that all alternatives have been assessed to the same level of detail.

Challenge 1 - Spatial Options Assessment

The initial spatial strategy options 1-4 and a recommended hybrid option have all been assessed to the same level of detail in the SA. Further options for additional housing delivery (Options A-D) have also been assessed to the same level of detail.

Two alternative growth points (PGP1 and PGP2) were assessed as part of options A-D for delivering additional housing growth in 2020. We question whether this exercise should have also included assessment of the original spatial options 1-5 at higher levels of growth. The way that these options have been assessed and information presented (in the Sustainability Appraisal Findings for the Stroud Local Plan Review Additional Housing Options, LUC, October 2020) does not include a comparison of how options A-D compare with the spatial strategy options 1-5.

The SA Report does not present a comparison of the growth point sites which have been considered in the development of the Local Plan and assessed in the SA in order for the sustainability performance of all of the growth point options to be compared. Table A9.1 within Appendix 9 of the SA Report (May 2021) provides the following reasoning for rejecting site PGP1 (WHI014/PGP1 Combined site WHI007 & WHI011):

> *"Having considered the results of public consultation, assessment work and local evidence, the Council has decided not to take this growth point forward into the Pre-submission Draft Local Plan. The site performs less well than alternative sites in terms of meeting sustainability appraisal objectives and compatibility with the proposed development strategy."*

Although it is acknowledged that the SA presents information about the potential effects of each site (housing, employment and mixed use) assessed, the SA Report should present the evidence that this site performs less well than alternatives sites by providing the information in a manner, such as a table, which allows comparison of performance of the growth points site

options together. This would also confirm which sites were considered as growth options which is not clearly set out in the SA.

We note that following the assessment of spatial options, the SA consultants recommended a hybrid spatial strategy option of Option 1 and Option 4. In the conclusions of the Sustainability Appraisal Findings for the Stroud Local Plan Review Additional Housing Options (LUC, October 2020, paragraph 1.82) the consultants recommend that the hybrid option continues to be pursued by the Council because of the sustainability benefits that the option provides. However, when the options 1-5 are compared in Table A8.1 in Appendix 8 of the SA Report (May 2020) Option 5 does not perform better than Option 1 when the potential significant positive, negative and uncertain effects are considered. Therefore, it is not correct to imply that option 5 is the most sustainable option and this draws into question whether rejecting sites on the basis that they do not conform to the chosen spatial strategy is an adequate justification, if the reason for choosing the preferred spatial strategy appears to be flawed.

Challenge 2 – Is Wisloe a Reasonable alternative?

There is little information provided in the SA Report (May 2021) or in the Local Plan Pre-Submission version about the deliverability of the infrastructure needed to ensure that the settlement at PS37 Wisloe is sustainable, such as the transport infrastructure required. The strategic site policy for Wisloe (Strategic Site Allocation Policy PS37 Wisloe new settlement) within the Reg 19 Local Plan includes:

- Provision of a primary school on site and contributions to a secondary school (but no location is given);
- On site and, if appropriate, off site work to mitigate against the identified impacts of development upon the Severn Estuary SAC/SPA/Ramsar site;
- On-site community and sports built provision and contributions to off-site indoor sports and leisure facilities, in accordance with local standards;
- Zero carbon energy generation to meet the needs of the community which may include small wind turbines, solar farms and biomass production;
- High quality and accessible walking and cycling routes within the site including the retention and diversion of existing footpaths as necessary and contributions and support to achieve safe pedestrian and cycle accessibility between the site and facilities in Draycott, Lower Cam and Cam local centre, as well as to Cam and Dursley station and to link with the Cam and Dursley Greenway to the south and to NCR 41 to the north;
- Contributions and support to sustainable transport measures on the A38 and A4135 sustainable transport corridors;
- Public transport permeability through the site and bus stops and shelters at appropriate locations within the development to access existing diverted and improved bus services and contributions to enhance bus service frequencies to key destinations including Cam and Dursley, Stonehouse and Stroud;
- Access improvements to Cam and Dursley station for sustainable modes and contributions towards the enhancement of passenger facilities;
- Primary vehicular access from the A38 and potentially from the A4135 and additional limited vehicular access from Dursley Road, with necessary improvements to the existing highway network; and

- Any associated infrastructure enhancements required and identified in the Stroud IDP in this location.

In addition to the list of infrastructure required to deliver the site, an SDC statement[1] identifies that there is a high pressure gas pipeline present on site PS37 running north-east to south-west and that the developer of PS37 will need to liaise with the pipeline operator (Wales and West Utilities (WWU)) to accommodate necessary mitigation measures in the detailed design of the development. Mitigation for the presence of the pipeline to ensure safety could include:

- Thicker walled sections pipe, or other additional protection, in consultation with the pipeline operator, to minimise the development area impacted by the pipeline;
- Re-alignment of the pipeline within proposed highways to avoid built development; and
- Designing the network of green open space within proposed development to accommodate the pipeline easement and avoid impact on the safe operation of the pipeline.

The SDC statement states that costs associated with any mitigation measures will be explored through the IDP and the impact on deliverability tested through the Council's viability assessment. However, the Local Plan Review: Infrastructure Delivery Plan (2021) recommends that the re-alignment of the pipeline would be expensive and that the layout of the proposed development at Wisloe should be designed to accommodate the requirement easement. According to information from the Health and Safety Executive (HSE), this would require a potential easement at least 140m wide. This would result in a 140m wide, straight area of green infrastructure across the entire site from north-east to south-west. The requirement for such mitigation has been omitted from the strategic allocation policy for PS37.

HSE advice appended to the SDC statement about the high pressure gas pipeline advises against granting of planning permission by SDC on the Wisloe site because the *"risk of harm to people at the proposed development site is such that HSE's advice is that there are sufficient reasons on safety grounds, for advising against the granting of planning permission in this case".* However, a consultation response from WWU does not object to proposals to a planning application at the Wisloe location and provides a map of the easement required.

Phasing arrangements are mentioned within the Local Plan PS37 strategic allocation policy as to be determined with the developer to ensure facilities are provided for new residents in a timely manner. There is no mention of an IDP for this site although infrastructure required for the site is referred to within the Local Plan IDP 2021 with some associated costs. Given the costs set out within the IDP for Wisloe and the Berkeley Cluster in which it is located, the need to incorporate a large easement for a high pressure gas pipeline on the site, and potential mitigation for noise (see Table 1 below) which does not appear to have been adequately included within the development considerations, it is not clear whether the development costs

[1] https://www.stroud.gov.uk/media/1166432/final-gas-pipeline-statement-website-june-2020_redacted.pdf

could be prohibitive and whether the site is deliverable and viable. We therefore question whether PS37 is actually a reasonable alternative.

Challenge 3 – Description of the nature of effects

Schedule 2 of the SEA Regulations requires the environmental report to present the likely significant effects on the environment including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects.

Table 1.1 in the SA Report (May 2021) indicates that the likely significant effects (including the nature of effects) is addressed in the SA in Chapters 4, 5 and 6 and Appendices 3, 5, 6, 7 and 8. Paragraph 2.27 of the SA Report states that the SA Report highlights "any likely significant effects (both positive and negative, and taking into account the likely secondary, cumulative, synergistic, short, medium and long-term and permanent and temporary effects)". However, how the positive, negative and cumulative effects have been determined is not clear as the scoring of effects has not been defined. The nature of potential effects is not described within the detailed SA matrices for site allocations in Appendix 7. Assumptions used in the assessment of sites are set out within Appendix 4 of the SA Report (May 2021) and this provides some information on how the potential effects have been attributed to the SA Objectives however it does not include the potential nature of effects such as permanence and timescales. Some discussion of long term effects is included within Section 6 of the SA Report (discussion of potential cumulative effects of the plan as a whole).

It is therefore concluded that information on the likely significant effects on the environment including short, medium and long-term effects, permanent and temporary effects, positive and negative effects is lacking in the SA Report (May 2021) and it is therefore not compliant with Schedule 2 of the SEA Regulations in this respect.

In addition, the potential cumulative effects of the strategic allocation site PS37 and other sites are unclear. Table 6.1 in the SA Report presents the potential cumulative effects of each of the elements of the plan assessed (including policies and sites). The potential cumulative effects of the Wisloe site (Site PS37) are shown as symbols and they are identical to the direct effects of Site PS37 presented in Table 5.4 and Appendix 7 Detailed SA Matrices for site allocations in the Draft Plan and the Pre-submission Draft Local Plan (in the un-numbered table for Site PS37). No discussion is provided on the potential cumulative effects of site PS37 on the settlements of Slimbridge, Cambridge, Gossington and Cam, for example. Potential cumulative effects of the PS37 site at Wisloe therefore appear not to have been fully identified and considered in the SA.

It is therefore concluded that information on the likely significant effects on the environment including secondary, cumulative and synergistic effects is lacking in the SA Report (May 2021) and it is therefore not compliant with Schedule 2 of the SEA Regulations in this respect.

Challenge 4 – Scope of the SA

The scope of the assessment altered as the plan length was changed from 2019-2036 to an end date of 2040. The SA Scoping Report (LUC, April 2018) states the plan end date is 2036. The

effect that this change in scope of the plan could have on the potential sustainability effects on the plan area does not appear to have been acknowledged within the SA.

Noise is not an issue specified within the SEA Regulations, however, it is included within the agreed scope of the SA within the SA Framework under SA 5, sub-objective "*SA 5.1: Does the Plan help to improve residential amenity (including potential to reduce light, smell and noise pollution) and sense of place?"*. It should therefore be considered within the assessments of the sites, however, it is not mentioned within the assessment of Site PS37 presented in Appendix 7 of the SA Report (May 2021) nor any of the previous SA reports. Table 2 below provides further discussion on noise at the Wisloe site.

Similarly, the SA has not addressed potential effects on existing settlements and communities, such as coalescence of settlements, under SA 5 which is also accompanied by a sub-objective "*SA 5.3: Does the Plan safeguard and enhance the identity of the District's existing communities and settlements?"* within the SA Framework. The SA of PS37 in the Pre-Submission Local Plan SA has been based on evidence in the landscape sensitivity assessment undertaken as part of the Gloucestershire Strategic Development Opportunities work. This work identified the area as having medium sensitivity to accommodate a small village (1,500 to 5,000 dwellings). A sub-objective of SA8 is *"SA 8.4: Does the Plan prevent coalescence between settlements?"* The potential effect of coalescence of settlements has not been addressed within the SA. Further discussion of this issue is included in Table 1 below.

The SA appears not, therefore, to have assessed this site according to the scope of the SA that has been agreed with consultees. Regulation 12(5) of the SEA Regulations requires the scope and level of detail of the assessment to be consulted on with the statutory consultees. This is therefore a compliance issue with the SEA Regulations.

Challenge 5 – Treatment of mitigation

Mitigation measures have been put forward in the SA Report to address negative effects only. SA best practice includes the consideration of uncertain effects as potential adverse effects and therefore we could consider that the mitigation put forward (which relates only to the Local Plan policies) is not sufficient and therefore a potential compliance issue with the SEA Regulations which require "The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme" to be presented (Schedule 2).

Challenge 6 – Inaccuracy in the SA and Use of Current Knowledge

The SEA Regulations require the information presented within the environmental report to take account of current knowledge and methods of assessment (Regulation 12(3)).

We have undertaken an exercise reviewing the assessments of the PS37 site presented in the SA Report (May 2021) undertaken by the Stroud District Council SA consultants with the following data sources:

- Stroud District Council Draft Local Plan Transport Objections to Proposed Allocation PS37 Wisloe prepared by Miles White Transport consultants on behalf of Slimbridge Parish Council, Wisloe Action Group and Cam Parish Council*;
- Wisloe Green Action Group Mixed-Use Development in Wisloe Green Air Quality Review prepared by Entran Environmental and Transportation consultants on behalf of Slimbridge Parish Council*;
- Wisloe Action Group – PS37 Ecology Statement (July 2021)*;
- Wisloe Action Group – Statement on Land Quality (PS37)(July 2021)*;
- Wisloe Green, Gloucestershire Review of Environmental Noise Assessment by Entran Environmental and Transportation consultants on behalf of Slimbridge Parish Council*;
- Letter dated 12th February 2021 to the Wisloe Action Group from Rob Askew, specialist soil consultant[2]*;
- Site Appraisal of Draft Site Allocation PS37 for a New Settlement at Slimbridge (Michelle Bolger Expert Landscape Consultancy, March 2021)*;
- Stroud District Council Local Plan Review: Infrastructure Delivery Plan (2021);
- Environmental Noise Assessment, Proposed Residential Development, Wisloe Green, Gloucestershire (Acoustic Consultants Ltd, October 2019);
- Cam Fields Design and Access Statement – Outline Application (May 2021);
- Land at Wisloe Green, Slimbridge/Cambridge, Gloucestershire, Heritage Assessment September 2019 prepared by Cotswold Archaeology;
- Habitats Regulations Assessment of the Stroud District Local Plan Review Pre-submission Draft Plan (Footprint Ecology, May 2021).
- Stroud District Council Local Plan Viability Assessment (Working Draft, May 2021); and
- Stroud District Council Gas Pipeline Statement June 2020.

* these documents can be found within the appendices to Slimbridge Parish Council's representations (prepared by JBPA) on Policy PS37.

Our review has identified there is no current knowledge or information available in addition to that referred to in the Sustainability Appraisal Report for the Stroud District Local Plan Review – Pre-submission Draft Local Plan (LUC, May 2021) in relation to SA 1 Housing; SA 2 Health; SA 3 Social inclusion; SA 4 Crime; SA 6 Services and facilities; SA 11 Water quality; SA 14 Climate change; SA 15 Waste; SA 16 Employment; and SA 17 Economic growth.

However, for the SA objectives listed within the following table, we have identified that there is better and additional information available to inform the SA. This information and the way in which it could affect the SA findings is discussed in Table 1.

[2] submitted to SDC on 20th February 2021

Table 1: Performance of Site PS37 in the Pre-submission Local Plan SA Report (May 2021)[3] compared with other available evidence					
SA Objectives	**Potential effects[4] of PS37 Pre-submission Draft LP SA Report**	**Data referred to in the SA of Pre-submission Draft LP (May 2021)**	**Is evidence available which better reflects current knowledge?**	**Current available evidence**	**Revised potential effect using current knowledge**
SA 2: Health	++/-	No data source provided	Yes	An SDC statement[5] identifies that there is a high pressure gas pipeline present on site PS37 running north-east to south-west and that the developer of PS37 will need to liaise with the pipeline operator (WWU) to accommodate necessary mitigation measures in the detailed design of the development. HSE advice appended to the SDC statement about the high pressure gas pipeline advises against granting of planning permission by SDC within the 70m consultation zone either side of the pipeline on the Wisloe site because the *"risk of harm to people at the proposed development site is such that HSE's advice is that there are sufficient reasons on safety grounds, for advising against the granting of planning permission in this case"*. However, a consultation response from WWU does not object to proposals to a planning application at the Wisloe location and provides a map of the	--?

[3] SA information taken from un-number table in Appendix 7 of the SA Report May 2021 entitled: PS37: New settlement at Wisloe, Wisloe (Slimbridge) (dwellings, employment, local centre (including retail, surgery and community uses), primary school, community, open space uses, improved bus services, strategic green infrastructure and landscaping)
[4] Please note that these effects include mitigation provided by Local Plan policies
[5] https://www.stroud.gov.uk/media/1166432/final-gas-pipeline-statement-website-june-2020_redacted.pdf

Table 1: Performance of Site PS37 in the Pre-submission Local Plan SA Report (May 2021)[3] compared with other available evidence					
SA Objectives	**Potential effects[4] of PS37 Pre-submission Draft LP SA Report**	**Data referred to in the SA of Pre-submission Draft LP (May 2021)**	**Is evidence available which better reflects current knowledge?**	**Current available evidence**	**Revised potential effect using current knowledge**
				easement required. The requirement for such mitigation has been omitted from the strategic allocation policy for PS37. Without mitigation the presence of the high pressure gas pipeline on the site represents a potential hazard to human health. A report prepared by Entran Environmental and Transportation Consultants (June 2021) undertook a desk based review of available traffic modelling and air quality monitoring for this area and identified that sources of air pollution currently on the site, including the M5 and A38, pose a risk to human health from air pollution. No mitigation to protect new residents of the proposed development from the existing air pollution is proposed within the PS37 Local Plan strategic policy. Due to air pollution and the presence of the high pressure gas pipeline and without mitigation within the PS37 Local Plan strategic policy, it is considered that a significant potential negative effect with uncertainty should be identified for SA 2.	
SA 5 Vibrant communities	++	No data source provided	Yes	The SA Framework includes a sub-objective for SA 5 *"SA 5.1: Does the Plan help to improve residential amenity (including potential to reduce light, smell and noise pollution) and sense of place?"* which has not been addressed in the SA of the Pre-Submission Draft Local Plan (May 2021) nor the previous sites assessments.	-?

Table 1: Performance of Site PS37 in the Pre-submission Local Plan SA Report (May 2021)[3] compared with other available evidence					
SA Objectives	**Potential effects[4] of PS37 Pre-submission Draft LP SA Report**	**Data referred to in the SA of Pre-submission Draft LP (May 2021)**	**Is evidence available which better reflects current knowledge?**	**Current available evidence**	**Revised potential effect using current knowledge**
				A noise assessment (Acoustic Consultants Ltd (ACL), October 2019) has been undertaken on behalf of the proponents of the PS37 Wisloe site. This assessment reported that noise levels from existing sources on the site (roads, rail and a commercial use) are considered to be high and will require mitigation which is suggested in the form of the layout of the development and the design of new homes and gardens. However, as no design for the development was available when the noise assessment was carried out, the effectiveness of mitigation has not yet been tested. Entran Limited environmental and transportation consultants have undertaken a review of the ACL noise assessment and have found that elements of the assessment require clarification and could be questioned, which could also bring into question the mitigation proposed. Although it may be possible to mitigate the current sources of noise on the site, it is not clear what level of mitigation would be required. For example, the PS24 allocation in the Local Plan borders the M5 and railway line to the north. The M5 in this location is also elevated as it is near to PS37. The mitigation being developed by the proponents of PS24 includes buffer zones from the M5 and railway line plus earthwork bunds with an acoustic fence on top. The height of	

Table 1: Performance of Site PS37 in the Pre-submission Local Plan SA Report (May 2021)[3] compared with other available evidence					
SA Objectives	**Potential effects[4] of PS37 Pre-submission Draft LP SA Report**	**Data referred to in the SA of Pre-submission Draft LP (May 2021)**	**Is evidence available which better reflects current knowledge?**	**Current available evidence**	**Revised potential effect using current knowledge**
				these would be 4 metres along the railway and 3-4 metres above the height of the M5 carriageway[6]. There is the potential for mitigation to reduce noise levels to acceptable levels for the uses proposed, however, the necessary space requirements and landscaping impacts are not defined. Due to the uncertainty regarding noise mitigation required and the potential secondary impact of noise mitigation measures, we consider that an overall potential minor negative effect, with uncertainty, should be identified for SA 5.	
SA 7 Biodiversity / geodiversity	-/+?	No data source provided. Discusses distance to designated sites.	Yes	The Policy for the PS37 strategic allocation site in the Pre-Submission Local Plan includes "on site and, if appropriate, off site work to mitigate against the identified impacts of development upon the Severn Estuary SAC/SPA/Ramsar site" although the SA does not explain what the potential effects of this site could be on the Severn Estuary. It simply states that it is within 7.7km of the SAC/SPA/Ramsar site. Sightings of Curlews have been registered with the	--?

[6] Cam Fields Design and Access Statement – Outline Application May 2021 https://www.stroud.gov.uk/media/1485640/ps24-west-of-draycott.pdf

Table 1: Performance of Site PS37 in the Pre-submission Local Plan SA Report (May 2021)[3] compared with other available evidence					
SA Objectives	**Potential effects[4] of PS37 Pre-submission Draft LP SA Report**	**Data referred to in the SA of Pre-submission Draft LP (May 2021)**	**Is evidence available which better reflects current knowledge?**	**Current available evidence**	**Revised potential effect using current knowledge**
				Gloucestershire Bird Recorder and the Gloucestershire Centre for Environmental Records (GCER) on the PS37 strategic allocation site itself and on land adjacent to the A38 to the south west of the PS37 site Curlew are classified in the UK as Red under the Birds of Conservation Concern 4: the Red List for Birds (2015), Priority Species under the UK Post-2010 Biodiversity Framework and listed as Near Threatened on the global IUCN Red List of Threatened Species. Curlew are identified as interest feature 7 of the Severn Estuary Special Protection Area (SPA) as part of the internationally important assemblage of waterfowl, meaning that the open agricultural land of the PS37 site and surrounding area are both important for curlew and is providing a supporting habitat for the Severn Estuary SPA. It should therefore be identified as functionally linked land to the SPA within the HRA of the Local Plan. It is currently not identified within the HRA Report dated May 2021. PS37 borders the River Cam which is part of a Strategic Nature Area (SNA) to the north west of PS37[7]. SNA have been identified in the Gloucestershire Nature Map as	

[7] Sustainability Appraisal Scoping Report for the Stroud District Local Plan Review (LUC April 2018) Paragraph 2.88 and Figure 3.3

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				landscape-scale areas of land which show where the characteristic habitats which typify the county can be expanded and linked to protect and enhance biodiversity assets. The SNAs include parts of a number of the other smaller water bodies (including the Berkeley Pill/Little Avon, River Cam and River Frome). There appears to have been no assessment on the potential effects on the River Cam from the proposed development at PS37 such as in relation to ground water, disturbance or the drainage solution proposed for the site. Negative effects on the River Cam could therefore affect the SNA which PS37 is next to. Although it is recognised that SA cannot always consider species level data, as SA is a strategic level of assessment, given the recorded sightings, an ecological assessment including project level HRA should be undertaken at the PS37 Wisloe site, including its status as functionally linked land. In the interim, a potential significant negative / uncertain effect identified in the SA. The potential positive effect identified in the Draft Local Plan and the Pre-Submission Local Plan assessments of this site assume that a net gain in biodiversity can be achieved and that any potential negative effects on species, habitats and designated sites can be avoided. Given that the SA appears to have been based on little evidence, it is considered	

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				premature to assume that a positive effect can be achieved without having evidence of what habitats and species are present on the site.	
SA 8: Landscapes / townscapes	+/-?	Landscape Sensitivity Assessment	Yes	The SA of PS37 in the Pre-Submission Local Plan SA has been based on evidence in the landscape sensitivity assessment undertaken as part of the Gloucestershire Strategic Development Opportunities work. This work identified the area as having medium sensitivity to accommodate a small village (1,500 to 5,000 dwellings). A sub-objective of SA8 is *"SA 8.4: Does the Plan prevent coalescence between settlements?"* As identified above in relation to SA5, the potential effect of coalescence of settlements has not been addressed within the SA. A landscape site appraisal of the PS37 site undertaken by an expert landscape consultant, Michelle Bolger, in March 2021[8] concludes that: *"PS37 is constrained by a number of factors. Of greatest importance in landscape character terms is the impact that development within PS37 would have on the local*	--

[8] Site Appraisal of Draft Site Allocation PS37 for a New Settlement at Slimbridge (Michelle Bolger Expert Landscape Consultancy, March 2021)

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				settlement pattern, both the sense of separation between settlements in Slimbridge, and their separation with Cam. This appraisal has found that PS37 would harm the identity of the separate settlements within Slimbridge by connecting them along the A38 and Dursley Rd, and through visual coalescence. This would result in the loss of a distinctive and valued characteristic of Slimbridge Parish." Furthermore: *"The constraint presented by the location of PS37 and its role in maintaining separate settlement identities cannot be overcome through design or expensive infrastructure and this significantly undermines the suitability of PS37 for large scale residential development."* It is considered that the landscaping shown on the PS37 map within the Pre-submission Local Plan does not demonstrate that the landscaping buffers proposed will adequately avoid coalescence of the new garden village with the settlements of Slimbridge, Cambridge, Gossington and Cam. Due to the potential for coalescence of settlements and a change in the identity of the existing communities in the Wisloe area, and the fact that the landscape appraisal of the	

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				site concludes that maintaining separate settlement identities cannot be mitigated, we consider that an overall significant negative effect should be identified for SA 8. As coalescence has not been considered in the assessments of other sites it is not known whether other alternative strategic sites would be less likely to result in villages and existing communities coalescing due to the new development proposed within the Local Plan.	
SA 9 Historic environment	+	SALA Heritage Assessment The site was screened out of the SALA Heritage Assessment as having no heritage impacts.	Yes	Land at Wisloe Green, Slimbridge/Cambridge, Gloucestershire, Heritage Assessment (Cotswold Archaeology, September 2019) concludes that: *"6.2. The Site has high potential for Romano-British settlement remains and possible remains of the Gloucester to Sea Mills Roman road. The Site has potential for medieval settlement remains, and more limited potential for Saxon settlement remains. The Site has some limited potential for Prehistoric remains, particularly later prehistoric deposits associated with the known settlement to the south of the Site.* *6.3. The proposed residential redevelopment of the Site would likely result in the truncation and/or total removal of the anticipated archaeological resource within the Site. None of these remains are anticipated to be of such significance that they would preclude such redevelopment. However, a*	--?

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				programme of archaeological evaluation works would be recommended in order to establish the nature and extent of the potential archaeological deposits, and establish their significance, in order to design a programme of archaeological works which could mitigate for the harm of their removal (through residential redevelopment of the Site, through preservation by record. It may also be possible, through heritage led design measures, to preserve some of the identified archaeological resource in-situ." The information provided above contradicts the SALA Heritage Assessment which was high level. On the basis of the Cotswold Archaeology report referenced above, the SA assessment of this site should be adjusted to record a potential negative and uncertain effect to reflect the fact that there is high potential for Romano-British settlement remains and possible remains of the Gloucester to Sea Mills Roman road on the site. Although the Cotswold Archaeology report suggests the effect on these remains is not considered to be significant, there is sufficient uncertainty to suggest that an uncertain significant negative effect should be identified in the SA.	
SA 10 Air quality	++/--	Stroud SALA Transport	Yes	The assessments of the PS37 allocation and the sites which form it recorded significant negative effects in relation to this SA Objective and cited the Stroud SALA Transport Assessment. This indicates that the site is considered to	-- cumulative

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		Accessibility Assessment		currently have poor sustainable transport accessibility. A mixed score is recorded in the assessment of the PS37 allocation in the Pre-Submission Local Plan (May 2021) on the basis of mitigation included within the Local Plan Strategic Site Allocation Policy PS37 Wisloe new settlement policy. A review of this policy, other policies within the Local Plan (May 2021), the Sustainable Transport Strategy (February 2021), and the Traffic Forecasting Report (March 2021) prepared by Miles White Transport consultants, questions whether the mitigation proposed to be implemented to deliver the Wisloe new settlement as a sustainable settlement with respect to transport is deliverable. The new settlement is likely to increase car use on local roads and in Cambridge and commuting to Gloucester and Bristol due to its location close to the M5 motorway and adjacent to the A38. An Air Quality Review prepared by Entran Limited environmental and transportation consultants dated 18/06/2021 states in relation to the PS37 allocation site that *"the draft local plan [May 2021] does not provide any details of consideration of exposure of future occupants to air pollutants arising from these [nearby road] sources and no details of any set back distances from the roads, or other mitigation requirements for the sensitive uses within the allocated site. The suitability of the Site in terms of air quality and human health has therefore not been demonstrated."*	

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				It continues: *"5.4 The proposed allocated site is for up to 1500 dwellings and 5 hectares of employment use. Such a development will likely generate significant road vehicle trips, which as discussed in section 4 is likely to be in the region of 11,500 trips per day. The draft local plan does not include any details of any consideration of the impact of the pollutants arising from the additional road traffic on the surrounding communities. The impact of additional road vehicles of such a magnitude within the surrounding small settlements is likely to be significant.* *5.5 The allocated site PS24 and committed development Northeast Cam, which are proposed in close proximity to the allocated site PS37, are also significant sized developments. The cumulative impact of emissions from road vehicle trips generated by these three large developments is likely to be significant and should be assessed cumulatively in order to determine the likely impacts on air quality and ensure the protection of human health.* *5.6 Overall, it is considered that in the allocation of site PS37 within the draft local plan there has been no consideration of air quality either with regards to the impact of the allocated development on the local area or the exposure of future occupants due to existing sources of air pollution."*	

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				Using this information from the Entran Air Quality Review, it is suggested that a potential significant negative cumulative effect on air quality (and human health) could result from the PS37 allocation site and it is uncertain that this potential effect on new residents could be mitigated. Given that alternative strategic sites (i.e. Moreton Valance and Whitminster) are located closer to the main employment centres of Stroud and Gloucester and motorway junctions, it is suggested that other sites could perform better than Wisloe in respect of air pollution and carbon emissions by producing fewer additional vehicle miles driven by new residents.	
SA 12 Flooding	+/-	No data source provided. The SA states that the site is on greenfield land outside of flood zones 3a and 3b.	Yes	The SA of the PS37 site in Appendix 7 of the SA Report (May 2021) states that the PS37 site lies outside of flood zones 3a and 3b and a potential minor negative effect is identified, which the reader can assume means that the site is vulnerable to some form of flooding and could be located in flood zone 2. The Stroud Local Plan IDP 2020 rates the PS37 site as high risk by Severn Trent Water should the sewage system be connected to the existing Cambridge/Slimbridge system. The following text is an excerpt from the IDP 2021 page 42 regarding flood risk at PS37:	--? cumulative

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				"*The site is in close proximity to the River Cam and there have been a number of recent sewer flooding events since 2007 affecting highways and the curtilage of properties. The site is included within the Environment Agency 2007 River Cam and Wickster's Brook detailed hydraulic model, but only a minor proportion of the site (1%) is considered to be impacted by fluvial flood risk. The site is at high risk of groundwater flooding, with a greater than 75% chance of groundwater emergence within a given 1km2 grid square, during a 1 in 100-year event. The Sequential Test must be satisfied. Only once the Sequential Test is satisfied should the Exception Test be applied. It is anticipated that proposed development will be sequentially located within Flood Zone 1. The ordinary watercourse on the northern site will need to be surveyed and mapped as part of any application. Any proposals for drainage will have to be split into the separate catchments. The western side of the site north of the A4135 may be difficult to drain to the ordinary watercourse given the levels. A site-specific flood risk assessment will be required because the site is within Flood Zone 2 and 3 and at risk from sources of flooding other than rivers and the sea."* In the conclusions on page 44 the IDB 2021 states: *"All major applications, and those sites in Flood Zones 2 and 3, require a flood risk assessment. It is expected that*	

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				developers accord with the drainage hierarchy, creating flood storage where appropriate and implement measures to ensure that surface water is not increased onsite or elsewhere. *Any flood risk schemes should be delivered (or funded) entirely by developers, unless the scheme were to have wide-ranging benefits for other development sites or for existing properties."* The IDP identifies that the PS37 site is potentially within flood zone 3 which is contrary to the SA which states that it is outside of flood zones 3a and 3b. This suggests an inaccuracy within the SA assessment. It is uncertain that the mitigation identified within the Local Plan policy for PS37 within the Pre-Submission Local Plan in relation to flooding (*"A positive strategy for attenuating and disposing of surface water through sustainable drainage systems (SuDS) that form part of the GI network")* is achievable on the site at PS37. The SA does not mention the	

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				strategic flood risk assessment undertaken on behalf of Stroud District Council[9] nor a site SFRA. It is therefore considered that current knowledge has not been used in the SA assessment and that the SA assessment is inaccurate by stating that the PS37 site lies outside of flood zones 3a and 3b. Based on the information within the IDP, the potential effect in relation to this SA Objective should be significant negative / uncertain and this effect could also be cumulative and affect a number of properties downstream. The SA should be informed by information about all sources of flooding on the site and suitable mitigation needed to avoid flood risk on the site and to other properties. There should be information available to demonstrate that the sequential test has been applied and that there aren't alternative sites which are at a lower risk of flooding.	
SA 13 Efficient land use	--	No data source provided.	Yes	The assessment of PS37 in the Pre-Submission Local Plan SA Report (May 2021) states that the site is within an area of Grade 3b agricultural land.	-- (no change)

[9] Stroud Level 2 Strategic Flood Risk Assessment Final Draft Report (JBA Consulting, May 2021)

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				However, SA Report Appendix 2 figure A2.8 Land Classification indicates the land is mainly Grade 2. Grade 2 is best and most versatile (BMV) agricultural land. A letter dated 21st February 2021 from soil specialist Rob Askew 'Re: Technical Review of Agricultural Land Classification: Land at The Narles Slimbridge Estate, Wisloe' also indicates the land is likely to be grade 2. Conclusion: the SA is inaccurate and provides no evidence to substantiate that the site is within an area of Grade 3b agricultural land. The SA therefore appears not to be based on current knowledge. It is not clear what would be required to mitigate noise levels from the M5 motorway and the A38 road on the Wisloe site. Should a large bund be required and potentially a 140m wide easement through entire site to avoid building over the outer zone of the high pressure gas pipeline these would not represent an efficient use of BMV Grade 2 agricultural land.	

Based on the review presented within Table 1, it is considered that the SA of strategic allocation site PS37 has not entirely been based on current knowledge and is therefore not compliant with Regulation 12(3) of the SEA Regulations.

Policy DCP1: Delivering Carbon Neutral by 2030 is being relied on as mitigation in the SA Report (May 2021) in Table 6.5 Pre-submission Draft Local Plan policies that would contribute to the mitigation of negative effects identified. We have not been able to identify any evidence as to whether this policy is deliverable. For example, the reliance on the planting of trees to act as carbon sinks is unlikely to sequester enough carbon by 2030 due to the numbers that will be required and the maturity of the trees in 2030. The spatial strategy for the Local Plan includes the development of greenfield land and is likely to increase traffic movements (i.e. at the Wisloe new settlement as discussed in Table 1 above), both of which could increase carbon emissions and reduce sequestration within the district. The assessment of Policy DCP1 which identifies a potential significant positive effect against SA 14 Climate change (Table 4.4 SA findings for the policies relating to the proposed development strategy within the SA Report, May 2021) is therefore questioned and it is suggested it should identify uncertainty.

Summary

Our review of the SA of the Stroud Local Plan Review has identified the following flaws in the SA:

Challenge 1: Spatial Options Assessment:

1) Alternatives for delivering additional housing growth in 2020 should have included an assessment of the original spatial options 1-5 at higher levels of growth.
2) There is no comparison of how options A-D compare with the spatial strategy options 1-5.
3) There is no comparison of the sustainability performance of all of the growth point options considered and assessed as sites.
4) A hybrid spatial strategy option was chosen due to its sustainability benefits but in comparison with spatial option 1 it does not perform as well when the potential significant positive, negative and uncertain effects are considered.

Challenge 2 – Is Wisloe a Reasonable alternative?:

There does not appear to be evidence that the Wisloe new settlement is deliverable and viable and therefore we would question whether it is actually a reasonable alternative.

Challenge 3 – Description of the nature of effects – non-compliance with SEA Regulations Schedule 2

Information on the likely significant effects on the environment including secondary, cumulative and synergistic effects is lacking in the SA Report (May 2021) and it is therefore not compliant with Schedule 2 of the SEA Regulations in this respect.

Challenge 4 – Scope of the SA – non-compliance with SEA Regulations 12(5)

The SA appears not to have assessed the Wisloe site according to the scope of the SA that has been agreed with consultees. Sub-objectives within the agreed SA Framework relating to noise and coalescence, have not been addressed within the SA of sites. Regulation 12(5) of the SEA Regulations requires the scope and level of detail of the assessment to be consulted on with the statutory consultees. This is therefore a compliance issue with the SEA Regulations.

Challenge 5 – Treatment of mitigation - non-compliance with SEA Regulations Schedule 2

Mitigation measures put forward in the SA are not sufficient as they do not address uncertain effects identified. This is therefore a compliance issue with the SEA Regulations which require "The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme" to be presented (Schedule 2).

Challenge 6 – Inaccuracy in the SA and Use of Current Knowledge – non-compliance with SEA Regulations 12(3)

The SA is found not to have been based on current knowledge. Information sources have been referred to in Table 1 above and in relation to an inaccuracy identified in the assessment in relation to coalescence, which provide a more accurate SA to be undertaken and this is considered to alter the sustainability performance of the Wisloe site, as summarised in Table 2.

Table 2: Summary Performance of PS37 in Local Plan SA and Alternative Performance Using Current Knowledge and Addressing Inaccuracies																	
	SA1	**SA2**	**SA3**	**SA4**	**SA5**	**SA6**	**SA7**	**SA8**	**SA9**	**SA10**	**SA11**	**SA12**	**SA13**	**SA14**	**SA15**	**SA16**	**SA17**
PS37 in SA Report (May 2021) includes mitigation	++	++/-	0	0	++	++	-/+?	+/-?	+	++/--	+/--?	+/-	--	+	0	+	++
PS37 using current knowledge includes mitigation	++	--?	0	0	-?	++	--?	--	--?	-- CE*	+/--?	--? CE*	--	+	0	+	++

* CE = Potential cumulative effect

Using current knowledge, the PS37 Wisloe site does not perform as well as the findings of the SA has recorded and appears to be a much less sustainable option. PS37 does not present itself as a sustainable option for a growth point for the following reasons:

- Potential to generate traffic and carbon emissions from private vehicle use given its location adjacent to the M5 motorway and distant from the major employment centres of Gloucester and Bristol;
- Potentially undeliverable infrastructure to achieve a sustainable settlement and carbon neutral development;
- The presence of a high pressure gas pipeline through the centre of the site requiring a wide easement;
- Existing sources of air and noise pollution which require significant mitigation to achieve an acceptable environment for new residents;
- The presence of archaeological finds of unknown value;
- The presence of a priority species and potentially providing a supporting function to the Severn Estuary SPA;
- The loss of valuable and scarce BMV Grade 2 agricultural land;
- A risk of flooding; and
- Risk of coalescence with the existing settlements of Slimbridge, Cambridge, Gossington and Cam.

Yours Sincerely,

[redacted]

Principal Consultant

[redacted]

Director

Appendix 22

GFirstLEP

Initial Consultation Response to Draft Plan.

9th January 2020

Planning Department
Stroud District Council
Ebley Mill
Ebley Wharf
Stroud
GL5 4UB

Dear Sir/Madam,

Representation to Stroud District Local Plan Review: Draft Plan for Consultation November 2019

Thank you for the opportunity to provide comments on the Stroud District Local Plan Review Draft Plan for Consultation. This letter provides comments on the proposed economic strategy identified in the Draft Plan on behalf of GFirst LEP's Construction and Infrastructure Business Group.

We have read the Plan together with the emerging strategy and economic policies.

Stroud District benefits from a very strong economy and in recent years has been home to a selection of world class companies and has developed a range of innovative technologies. Historically, the economy has been centred largely on manufacturing businesses. However, it is now considered that there is a need to provide for qualitative improvements in the existing employment stock as well as diversifying the types of employment available in the District.

We understand that Stroud District has previously experienced a considerable amount of out-commuting, with younger and more skilled workers leaving the District or travelling greater distances to find more skilled employment opportunities in centres such as Bristol, Birmingham and Cheltenham. Part of the problem with the current employment base is that it is centred on low skilled jobs, and with few, quality employment sites to attract and maintain knowledge intensive businesses and key staff. The District does however have a reputation for advanced technology and creative skills, and it is considered that this needs to be promoted and expanded during the next Local Plan period. Stroud does not have a strong retail base and therefore should not rely upon this source of employment.

GFirst LEP's Construction and Infrastructure Business Group therefore believe that the Local Plan needs to target additional employment sites that are attractive and accessible, to help retain good quality local businesses within the District and help diversify the type of employment available. Attracting the right type of businesses and growing knowledge