Summary

The Save Barton Farm Group asserts that development proposed at Barton Farm would, while protecting its own structures from flood nuisance, considerably increase the risk of flooding in the neighbouring villages of Kings Worthy and Headbourne Worthy and downstream in Winchester. The substitution of a built environment for the present arable fields would simultaneously increase surface run-off and decrease the recharging of the aquifers.

The run-off from a suburban district would be faster, more erratic and more polluted than the present flow; and the outline proposals for SUDS, permeable hard standing and catchment ponds would present monitoring and maintenance problems in the future.

We also maintain that the net increase of water reaching the site via the potable supply and the consequent increase of effluent released by the Harestock WwTW into the River Itchen just upstream of Winchester has not been properly examined.

Above all we believe that, since the proposal to build on Barton Farm runs in many ways counter to the advice in PPG25: Development and Flood Risk, planning permission should not be granted until after publication and consideration of the full Itchen Sustainability study.

FLOODING

Introduction

The proposed development consists of 2000 dwellings, retail premises, a community centre and primary school together with roads, pavements and vehicle hard standing.

The site is situated on an area of arable farm land in the River Itchen catchment area. It is the rain-fed groundwater filtering through the chalk that at present keeps the flow regime of the river (a candidate Special Area of Conservation) relatively benign. *"Flows are maintained during dry periods and there are less intense high flows after heavy rain."* [1]

Even with this mechanism in place Barton Farm and Winchester have suffered episodes of flooding for more than twenty years. [2]

Climate change is as yet imperfectly documented and understood but there are indications that we should expect wetter winters. A report has been published [3] showing that there is more rain falling over 90% of Great Britain than was the case 40 years ago. It is therefore vital that the advice of PPG25 to Local Planning Authorities that they should apply
"…the precautionary principle to decision making so that risk is avoided where possible…" [4]

Development at Barton Farm has the potential to increase flooding in Winchester, as outlined in the Environment Agencies Winchester MDA Strategic Flood Defence and Drainage Issues. [5]

Evaluation of this site from a flooding perspective should consider

- the difference in the nature of run-off from open farmland and a built environment
- groundwater flooding
- the risk of increasing flooding in the River Itchen as it flows through Winchester
- the implications for households in Winchester that have already experienced flooding
- damage to the River Itchen
- damage to and pollution of the underlying aquifers
- problems associated with flood amelioration structures
- questions of water extraction and sewage treatment

Run-off

At Barton Farm the topsoil and overburden, approximately 1 metre deep, lie over solid chalk. Rainfall percolates rapidly into the soil and joins groundwater in the chalk. [6] In winter the interception of ploughed land or winter crops permit between 0 mm an 2 mm of rainfall to evaporate. [7] Thus in normal conditions most of the rainfall has time to filter through the topsoil and fissures in the chalk to

eventually augment the River Itchen. This is a relatively slow process and in the course of its journey the water is so cleansed that the river is
"…reportedly, one of the least polluted chalk rivers in England." [8]

In contrast run-off from a built environment is faster, more copious (because it remains near the surface) and more vulnerable to pollution. It is likely to contain petro-chemicals, heavy metals and sediment. [9] This is admitted throughout the Cala Environmental Statement, for example p.284, para.14.41
"As there is a considerable pollutant load in the run-off…"

There is a very real risk (outlined in Core Document 19.1a [10]) that this run-off could enter the river via the dry valleys at times of exceptionally heavy rain.

Barton Farm lies above and to the west of the River Itchen. The proposed area of development is crossed west to east by Dry Valley 2 that runs under the railway, down to Barton Mark Lodge and Barton Hill Farm cottages and onwards to the river. Another Dry Valley, to the north of Wellhouse Lane (DV3) runs from the John Moore barracks, past the sewage treatment works and into Kings Worthy where it joins Dry Valley 5 and ultimately the river. [11]

In order to ameliorate these problems attenuation structures would have to be built (of which more below).

Groundwater flooding

Water levels below ground rise during wet (usually winter) months and fall in dry months as water flows out into rivers.

Groundwater flooding occurs when the natural storage capacity of the underground aquifers is exceeded by unusually high rainfall. Water appears in springs and seepages in valleys that are normally dry and have no watercourses [12] and flows either to the nearest river or to any intervening low ground. It can take a long time to recede.

It is most likely to occur in areas of chalk and limestone. Barton Farm lies over chalk and has suffered flooding in its so-called 'Dry' Valleys.

The developers have proposed to deal with the problems of run-off by the use of soakaways and boreholes but the Winchester Strategic Flood Defence and Drainage Issues states:

"It should be noted that the effectiveness of soakaways will depend on ground-water levels both now and in the future, when the effects of climate change and water abstraction strategies take effect, and during wet winters when ground-water levels are high." [13]

It goes on to remind us that
"…it is possible that the direct disposal of rain water to the chalk, a meter or so below ground level via soakaways, might increase ground-water levels over and above the levels which would have occurred when rain water had to percolate

through the top soil and the first meter or so of chalk, where flow paths are longer, storage could occur and where evapostranspiration would take place; thereby increasing the ground-water flood risk along DVs 2,3,4 & 5." [14]

Furthermore dry valleys have a natural ability to flood from ground-water and the discharges from attenuation structures would be concentrated at the lowest point of the site where the DVs 2,3, & 4 meet the railway line. This would surcharge ground-water levels there which could well increase the existing ground-water flood risks at Kings Worthy and Headbourne Worthy.

Increased flooding in Winchester [15]

Part of Winchester lies in the floodplain of the River Itchen [16] and it floods regularly, usually in a relatively minor way. In recent years however the flooding has been more serious, with the inundation of roads and the ground floors of buildings. There is clearly no additional capacity in which the water running from the River Itchen north of the city and its tributaries in Kings Worthy and Springvale can be accommodated. By converting groundwater to run-off (as outlined above) the development of Barton Farm would add considerably to what is already a problem. This is acknowledged in Topic Paper 7 which recognises that run-off from development can exacerbate downstream flooding. [17]

Implication for households

As well as causing ill health, distress and a loss of the sense of security there are financial penalties attached to living in a dwelling that has suffered flooding. Cleaning, drying out and re-furbishing must be paid for. Hitherto the insurance industry has promised that no householder will be unable to take out insurance against flood damage but this has now changed. The owners of properties that have flooded repeatedly in the past and where the likelihood of flooding is the same or greater, will not be able to insure them [18].

Damage to the River Itchen

The River Itchen is a candidate Special Area of Conservation and abuts both Sites of Special Scientific Interest and Sites of Importance for Nature Conservation. [19] It is also vulnerable. The disturbance of land surfaces and subsoil could change the established groundwater characteristics of its catchment area. *"Extreme flood flows can wash out weed beds and spawning gravels, undermine banks and structures, and lead to extensive flooding."* [20] Most tellingly it is the opinion of the Environmental Agency that one of *"The main sources of sediments are … run off from urban surfaces, especially construction sites."* [21]

The Winchester District Local Plan Review recognises both the importance and fragility of the river. It states that nature conservation should be protected and that there should be an *"appropriate assessment"* of the effect of development on the River Itchen. [22]

It is unfortunate that the delayed publication of the full Itchen Sustainability Study precludes a closer examination of this aspect of the problems and development at Barton Farm.

see SBFG Proofs of Evidence on Countryside and Landscape, especially development land and impact on SSSI, cSAC and River Itchen.

Damage to and pollution of the aquifers

No landscape is static. Until the 1990s there was little anxiety about the aquifers surrounding the city. *"Water levels … seem to have changed very little, and appeared healthy."* [23] This is no longer the case. It is no doubt in part the consequence of natural climate fluctuations, of several dry summers and changed rainfall patterns.

The concern now is for avoidable, construction-engendered damage. *"Chalk becomes relatively impermeable when walked on and impacted"* [24] and it *"powders or forms slurry when worked in wet conditions and becomes quite impermeable."* [25] It would be difficult to build a development on chalk downland without walking and driving vehicles on it in either wet or dry conditions. Impacted areas will reduce the area receptive to rainfall.

Another concern is the possibility that the aquifers would become contaminated by the injudicious use of boreholes and sumps to deal with surface water. It has been admitted by the developer [26] that boreholes increase the flow by reducing the length of the flowpath and increase the risk of pollution.

The unsatisfactory nature of flood attenuation structures

Cala Homes proposes a mix of piped drainage and infiltration

- roofs to be drained to soakaways or individual infiltration trenches
- roads to be drained by a gully and pipe system, and possibly swales, passing to a pond or series of ponds for infiltrating the run-off. These would have sedimentation basins
- public parking to have permeable pavement to allow direct infiltration

There are three main problems with flood mitigation works: while protecting a particular area they can have adverse effects upon other parts of the water system, their design is problematical and they require long-term monitoring and maintenance.

The Winchester District Local Plan Review recognises that development in one area can have repercussions in another. [27] The HCC Planning and Transport committee says that local planning authorities have a responsibility to *"ensure that development … does not contribute to increased risk of flooding, locally and elsewhere."* [28]

Gullies and pipes must debouch into a secure reservoir and are dependent for their effectiveness on meticulous construction. Settling and retaining ponds must be large enough to contain the volume of water produced by the most extreme weather conditions. If they are not the resultant overflow can be more violent and more polluted (because of the accumulation of contaminants) than even unobstructed run-off. Soakaways and infiltration trenches fairly quickly become compromised due to either rising groundwater level or blockage by fine particles. An example of this is the relatively short period during which the soakaways dug at the corner of Stoney Lane worked effectively. [29]

A total SUDS (Sustainable Urban Drainage Systems) solution would be difficult to find space for at Barton Farm while complying with PPG3 densities which demand 2000 dwellings on the 84 hectares. It should also be remembered that the SUDS National Framework is currently out for consultation.

The Winchester District Local Plan Review recognises that, were Barton Farm to be developed, there should be a provision for *"… long term monitoring and management"* [30]. It also states that developers would be expected to *"… identify, implement and fund the necessary measures …"* (my emphasis). [31]

Questions of water extraction and sewage treatment

Water extraction.

In our view insufficient attention has been played to the questions of water supply and sewerage treatment, perhaps because, to quote the Proof of Evidence submitted on behalf of Cala Homes [32]
"Reference to water supply and sewage treatments are not the responsibility of the developer…"

They are however the responsibility of those who make planning decisions.

Southern Water Services is the statutory undertaker for water and waste water and they have written to the developer [33] that they have sufficient capacity in their overall distribution network to supply an MDA at Winchester City (North) within its existing abstraction licence base but, perhaps mindful that the water for Barton Farm would be in addition to the water already abstracted, the Winchester District Local Plan Members Panel observe
"The potential impact of further abstraction on the River Itchen's nature conservation interest remains, however, to be assessed." [34]

This impact should be thoroughly investigated before planning permission is given for a major development.

It is probable that the water for Barton Farm would be supplied from the existing licensed source at Otterbourne, downstream from Winchester. In their environmental statement [35] the developers are at pains to explain that they envisage very little change to the overall burden of water reaching the River Itchen through their infiltration ponds and soakaways. They have neglected to take account of the considerably increased flow from an expanded Harestock

WwTW that would process the sewerage from an additional 2000 dwellings. This flow will join the River Itchen upstream of Winchester. Thus water would be pumped from downstream of a city with very little ability to increase its hydraulic capacity to a pinch point just before the river reaches the built-up area.

Sewerage.

It is proposed that the sewerage from the MDA should be processed by the Harestock Waste water Treatment Work located in Dry Valley 3 next to the Andover Road, to the north of the site. It works on trickle filter beds and effluent is discharged into the River Itchen immediately downstream of Headbourne Worthy. [36] It is at present serving approximately 19000 people and all parties admit that it cannot cope with any more in its present state.

This means that it would either have to be enlarged or re-sited.

Improvements are currently being planned and constructed but these would not be sufficient for the proposed additional flow. Southern Water is only allowed to spend its funds on schemes that have been approved by OFWAT in the regular strategic 5-year plan process. This is currently on-going for the 2005-2010 period. Improvements to cope with an MDA would be a major undertaking and as Southern Water has not yet been approached such an undertaking has not been incorporated into their forward planning.

If developments were to proceed before the necessary improvements were undertaken the volume of flow could overload the WwTW and effluent quality would suffer. If effluent was not to the required standard, the River Itchen to which it discharges could be polluted and Southern Water would risk prosecution. [37]

In some ways relocation would seem to be the better option. The site has already proved to be vulnerable to groundwater flooding arising in DV 3 and it was out of action for approximately 2 weeks during the winter of 2000-2001.

One of the developer's proposals is that overflow from one of their settling ponds could be pumped to *"…the field to the north…"* (i.e. downslope of the sewage works) if the pond should prove to be inadequate to deal with surface water run-off from the northern part of the development. [38]

But moving the WwTW would be very expensive and present problems of siting. It would mean that an additional area of green fields would be built on.

Although upgrading the WwTW is a possibility it has been admitted that *"The impact on the River Itchen may possibly require tighter consent standards to limit the effluent impact on the river to current levels."* [39]

The developers environmental statement makes no reference to the summertime reduced baseflow from chalk groundwater sources that would cause a loss of treated sewage treated-effluent dilution. This is of a particular concern in the

Itchen catchment where such water comes from natural springs and groundwater flow.

Conclusions

Siting a development on land that ultimately drains into a fragile river of international importance and a vulnerable ancient city centre would be most unwise. Elevated levels of pumped effluent and diverted run-off threaten the River Itchen, the neighbouring villages of Kings Worthy and Headbourne Worthy and fabric of a city of great cultural and historic importance. The exploitation of Barton Farm must not threaten the well being of those who already live in Winchester and its surrounding communities.

References

[1] **The State of England Chalk Rivers** Environment Agency and English Nature, p.16 2nd para.

[2] see Appendix

[3] reference taken from **Winchester and the Floods** pub. by Barton Farm District Local Plan Support Group, December 2001 to Information Sheet 15; Changing intensity of rainfall over Britain by Tim Osborne, Climatic Research Unit, University of East Anglia, p.1

[4] **PPG Guidance 25**: Development and Flood Risk, para. 8, 4th bullet

[5] **Winchester MDA-Strategic Flood Defence and Drainage Issues** Environment Agency, February 2002, 4. Off-site Flooding, para. 4.1 to 4.3

[6] **Winchester City (North) Environmental Statement**, Vol.1: main document on behalf of Cala Homes (South) Ltd by Mason Richards Planning [document hereafter to be called 'Cala'], p.277, para.14.24

[7] Cala p.279, para.14.24

[8] **Winchester City and Its Setting** Landscape Design Associates, December 1998, p.5.7.3, para.5.7.15

[9] points taken from **Winchester and the Floods** (see above)

[10] Core Document 19.1a **Winchester MDA-Strategic Flood Defence and Drainage Issues**, p.4 para.4.2

[11] see maps at the end of the above document

[12] **Hampshire Water Strategy** Hampshire's Water Project, March 2003, p.21, para.3.4.4

[13] **Winchester MDA-Strategic Flood Defence and Drainage Issues**, p.4, para.4.3

[14] ibid, pp.4-5, para.4.3

[15] see **Winchester and the Floods**

[16] **Winchester District Local Plan Review**, RD11.12, p.115, para.11

[17] **Topic Paper 7**, p.23, para.4.21

[18] BBC 10 o'clock News, 13th September 2004

[19] **Topic Paper 7**, Composite Constraints Map for Littleton and Barton Farm sub areas

[20] **The State of England Chalk Rivers**, p.29, para.4

[21] ibid. p.47, bullet point 4

[22] **Winchester District Local Plan Review**, RD12.51, p.141, Proposal NC3, ix

[23] **Winchester City and Its Setting**, p.5.7.2, para.5.7.14

[24] Cala, p.285, para.14.44

[25] Cala, p.297, para.14.82

[26] Cala, p.285, para.14.44

[27] **Winchester District Local Plan Review**, RD03.20, p.19, Proposal DP.11, 3.44

[28] **Hampshire County Council Planning & Transport Committee**, 22nd January 2001, p.5, para.5.1

[29] personal communication from resident of Andover Road

[30] **Winchester District Local Plan Review**, RD03.22, p.19, 3.45

[31] ibid

[32] **Winchester District Local Plan Review 2001-2011**, Local Plan Inquiry on behalf of Cala Homes (South). Proof of Evidence of James Sharp, p.40, para.4.49

[33] Southern Water (letter dated 3rd November 2003). Reference in Cala Environmental Statement Vol.1, p.358, para.17.23

[34] Winchester District Local Plan Members Panel, 22nd June 2001, **Winchester City (North) Major Development Area: Proposed Area of Search and Local Plan Proposal.** Report of Chief Planning Officers, pp.17-18, para.8.7

[35] Cala, see especially Chapter 14

[36] Cala, p.76, para.14.16

[37] **Winchester North MDA Consultation-comments/objections**, PDC464-appendix 2-Consultation Response Summary. R.Douglas, Planning Engineer Southern Water

[38] Cala, p.284, para.14.42

[39] Cala, p.276, para.14.16