

EA ref: WA/2018/125209/01-L01

LPA ref: WA/2018/0797

23<sup>rd</sup> September 2018

Waverley Borough Council  
Planning Department  
The Burys  
Godalming  
Surrey GU7 1HR

Dear Sirs,

**Erection of 2 dwellings and a detached garage along with associated landscaping.  
30 Frensham Vale, Lower Bourne, Farnham, GU10 3HT.**

With reference to the above application we understand the Environment Agency (EA) raised an objection to this scheme, as detailed in their letter of 5<sup>th</sup> June 2018, as the site lies in Flood Zone 2 and 3 of the EA flood maps with a high risk of flooding. The EA objection was that the Stilwell Partners' Flood Report Assessment (FRA) did not demonstrate the proposed development would be safe over its lifetime with a safe access and escape route; that the report did not ensure that there would be no loss of flood plain storage which would otherwise increase flood risk elsewhere and that the Sequential Test which may be required was not considered. It was stated that the FRA should include an assessment of climate change in accordance with the new allowances using the EA Thames Area Climate Change guidance.

The applicant revised the FRA and this concluded the site was in Flood Zone 1 by superimposing flood levels from a Hydraulics Research (HR) model developed in 2012 onto a new topographical survey which showed the proposed development plots are above the predicted flood levels and flood extents as shown in Appendix G of the FRA (Figure 1). This is contrary to the HR report which showed the site was Zone 3 (Figure 2) the same as the EAs flood maps (Figure 3). There is clearly a discrepancy between both the EA and HR flood maps and that provided in the FRA.

The EAs subsequent letter of 24<sup>th</sup> July withdrew their previous objection on the basis that the flood map in the FRA showed the site in was Zone 1 despite being shown as Zone 3 on the EA and HR flood maps. As the FRA conveniently shows that the proposed residential dwellings will be outside of the 100 year + CC flood extent and in Flood Zone 1 then none of the EAs previous objections apply. ***The reasons for the EAs withdrawing their objection does not appear to be sound and is based on simply accepting the FRA revised flood maps rather than a detailed scrutiny or appraisal of the evidence which we have therefore undertaken ourselves, as detailed below.***

**Report supplied by Dr Paul Garrad BSc PhD AMCIWEM dated 22<sup>nd</sup> September 2018.**

- An independent consultant with 25 years' experience in hydrology, Flood Risk Assessments and river modelling.
- More than 200 Flood Risk Assessments undertaken including housing schemes, hotels, care homes, holiday parks, retail units, business parks, power stations, wind farms, recycling centres, marinas, airports, mineral extraction, industrial plants and the London Eye.
- Hydrology, FRAs and flood risk studies in the fluvial and coastal environments are based on the latest FEH software, 1D or 2D river models, extreme sea level analyses, the effect of climate change, site runoff and SUDS assessments.
- Technical advice and review of projects for the Environment Agency at a national and regional level. More than 50 training courses undertaken for the EA and consultants in flood estimation (FEH), urban hydrology and FRA methods.
- Member of the British Hydrological Society and Chartered Institute of Water and Environmental Management (CIWEM).

**1. Flood Maps**

The EA flood map provides a similar flood outline as the maps in the HR report but the map in Appendix G of the FRA is far less extensive which is odd as the HR and FRA maps are based on the very same flood level data. This should have been explained and justified before the EA accepted the revised flood map in

the FRA and withdrew their objection. The only possible explanation, as the flood levels are the same, is that the FRA has used different ground survey data but then superimposing HR modelled flood levels which are based on a 2012 source of LiDAR data onto a different or new ground level survey, whether LiDAR or traditional, will often result in different flood extents and **technically this is not acceptable**. The flood maps should only be drawn on the same topo data from which the flood extents were derived on which the model was based. The other cause would be if there have been large scale land level changes on the site and on the flood plain but if this has occurred this would have been undertaken without planning permission. For these reasons we do not believe the FRA flood map is a true or accurate reflection of the flood risk on this site.

## 2. Flood Levels

The FRA flood map in the FRA is stated as being based on the HR Report which gives flood levels as:

Location	100 Yr	100 Yr + 20%	Increase
Upstream	71.13	71.13	0.00
Middle	70.86	70.87	0.01
Downstream	70.67	70.69	0.02

There are no or only very small changes in flood levels for a 20% increase in flow which is unusual but as the HR model is not available for inspection it is not possible to question these levels.

## 3. Climate Change

The HR Report used a 20% increase in flow for Climate Change (CC), which was appropriate at that time, and the FRA correctly states that these flows and levels should be updated in line with the EAs 2016 CC guidance. The FRA states "An interpolation method will be used in line with best practice" but no details of how these levels are derived and this must be provided to confirm the approach used was acceptable. The resulting levels are as follows:

Location	100 Yr	100 Yr+35%	100 Year+70%	Diff 35%	Diff 70%
Upstream	71.13	71.147	71.165	0.017	0.035
Middle	70.86	70.877	70.895	0.017	0.035
Dstream	70.67	70.705	70.740	0.035	0.070

Again these are very small changes in flood level for a large % increase in flow and show as above a 20% increase in river flow would increase flood levels by 0mm to 20mm, a 35% by 17mm to 35mm and 70% by 35mm to 70mm but without the HR model and the interpolation calculations used in the FRA it is not possible to confirm why this occurs but this is very unusual. These flood levels were then plotted on the topo survey and presented as a flood map in Appendix G of the FRA which showed the building Plots are outside the 100 year flood limit and entirely in Flood Zone 1.

It is unusual for the EA to accept a revised flood map without (a) confirming whether this is accurate, and (ii) that the estimates consider their own EA Thames guidance on CC which was referred to in their earlier letter. This EA guidance indicates that 2 dwellings are classed as a minor development and Table A suggests in Zone 3 the 'basic' approach should be used as this is a 'more vulnerable' development. The text below Table B indicates that for developments in flood zone 2 the central climate change allowance is the EAs minimum benchmark and in flood zone 3 the higher central allowance should be used. In sensitive locations it may be necessary to use the higher central (in flood zone 2) and the upper end in flood zone 3. Table B shows these allowances are 500mm, 700mm or 1000mm and adding these allowances to the HR defined 100 year flood level show the site is firmly in Flood Zone 3. It is not clear why the EA did not insist their own guidance was used, as they requested, to assess the impact of climate change.

#### 4. Accuracy of HR Model

An earlier review of the HR River Modelling report (9th October 2012) suggested:

- The flows have not been checked but appear reasonable using the most recent methodologies and software.
- The model is not available for checking.
- The very small difference in flood levels is unusual and should be checked
- The adopted Manning's roughness values for the channel of 0.018 is very low for a vegetated overgrown stream channel. Higher values would increase flood levels and should have been used.
- The model is not calibrated
- The capacity of the various culverts could restrict flows and it is not clear if or how these were included in the HR model.
- The HR report indicates that blockage of culverts would increase water levels by 360mm in which case flooding of this site may be a higher risk than the FRA flood map shows.
- Appendix G of the FRA shows that the difference between flood levels and ground levels at the building plots is small so that even a small margin of error in the calculations could make a difference to the flood map extents.

In summary the FRA is based on:

- The HR Report flood levels which have been accepted without checking the model or making any revisions for updated flows,
- A CC interpolation method that is not provided but which did not consider the EAs own CC guidance as required in their original letter of objection. The adopted approach provides a very small increase in flood levels for large increase in flow which is unusual and should be explained.
- It is considered likely that the FRA superimposed the HR flood levels, which were based on one source of LiDAR data, onto a different source of survey data and hence derived flood extents that are less extensive than the EA or HR **but this approach is unacceptable.**
- There is no explanation as to why the flood maps provided in the HR report, which show a similar flood outline as the EA flood maps, were not adopted other than they show the site is in Zone 3 and this would not remove the EAs objection.

It is not usual for the EA to accept this low level of detail and explanation in a FRA nor accept revised flood zones based on what appears to be erroneous assumptions and a rather simplistic and cavalier approach. Simply redrawing a flood map using spurious or erroneous data does not reduce the flood risk on this site. We suggest the Zone 1 designation in the FRA is incorrect for the reasons detailed above and that the site lies in Zone 3 (3b) as shown on the EA and HR flood maps. **As such the EAs previous objections still apply.**

Please study this report, commissioned by local people, with great care as the wrong decision will have damaging implications for residents in Frensham Vale.

Yours faithfully,

Mr Joseph and Mrs Helen Michel, 23 Frensham Vale

Mr David and Mrs Audrey Virgo, 21 Frensham Vale

Mr Garth and Mrs Betty Hutton, 19 Frensham Vale

Mr Peter and Mrs Sharron Hornsby, 34 Frensham Vale

Figure 1 Stilwell FRA Flood Map (FRA Appendix G)

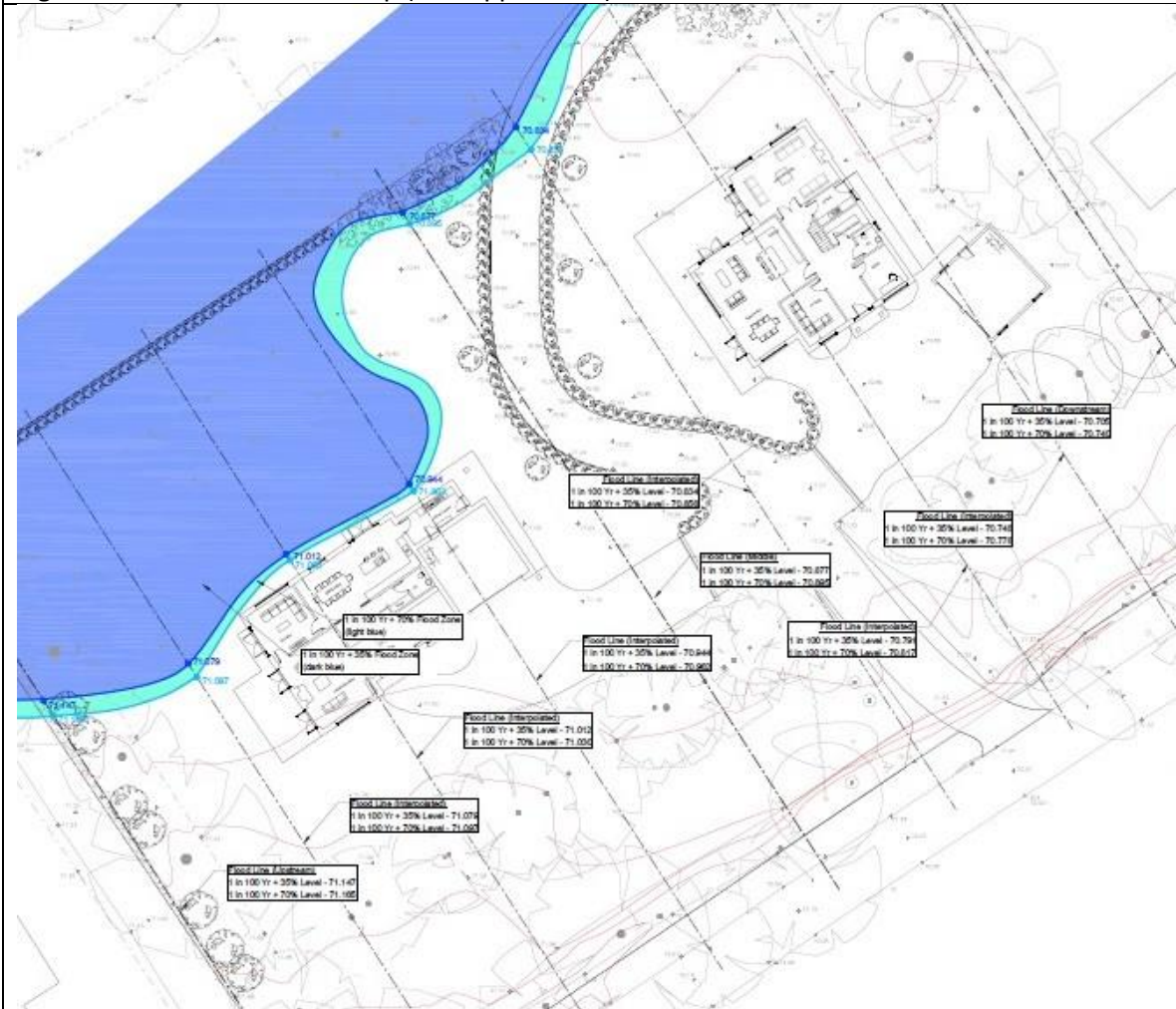


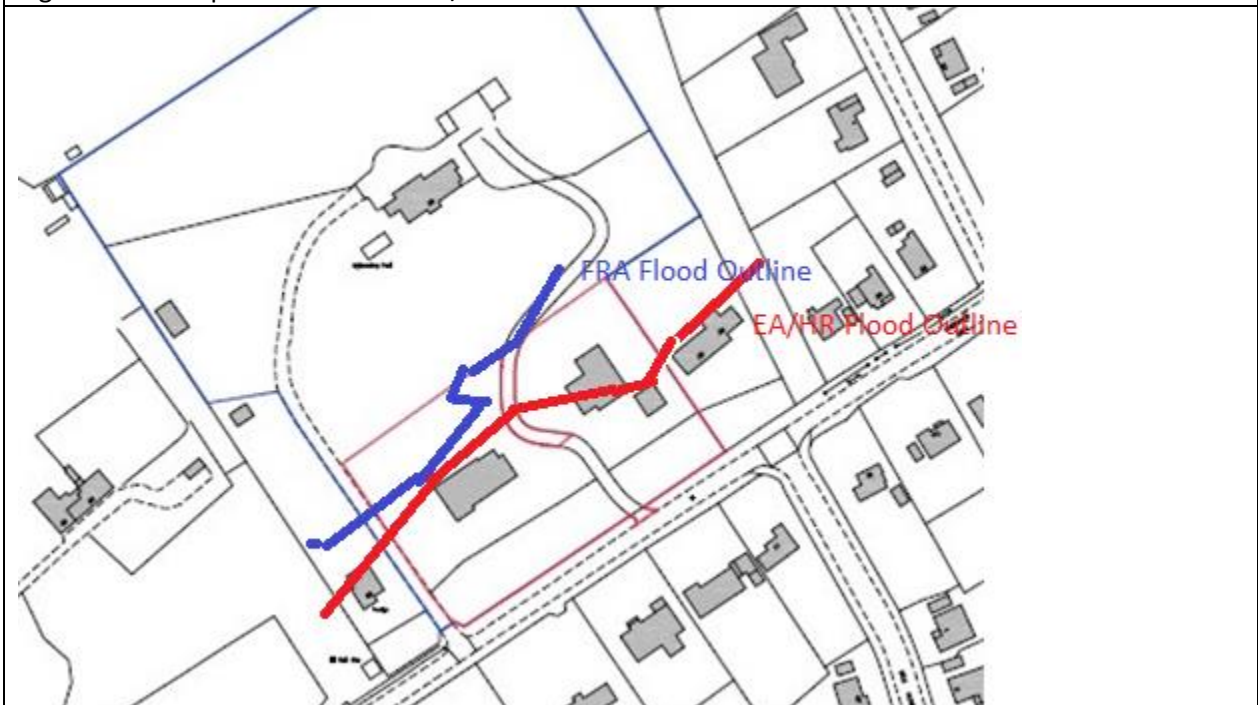
Figure 2 HR Flood Map (from HR 2012 Report) 100yr + CC



Figure 3 EA Flood Map (EA Web site)



Figure 4 Development Plan with EA /HR and FRA flood extents



NB. Blue upper outline = Stilwell Partners FRA Flood Outline  
Red lower outline = EA/HR Flood Outline