Norfolk County Council
Community and Environmental Services
County Hall
Martineau Lane
Norwich
NR1 2SG

via e-mail
Mr Simon Marjoram
Planning Section
South Norfolk Council
The Horizon Centre
Broadland Business Park
Peachman Way
Norwich
NR7 0WF

NCC contact number: 0344 800 8020
Textphone: 0344 800 8011

CC: Ed Abigail, Environment Agency

Your Ref:	Level 2 SFRA Draft Review	My Ref:	FW2023_0455
Date:	19 June 2023	Tel No.:	0344 800 8020
		Email:	llfa@norfolk.gov.uk

Dear Mr Marjoram,

Review of South Norfolk Response to the LLFA Comments on the South Norfolk Level 2 Strategic Flood Risk Assessment (SFRA) Addendum

Thank you for your consultation on the above site, received on 18 May 2023. We have reviewed the response as submitted and wish to make the following comments.

The LLFA notes that South Norfolk Local Planning Authority (LPA) has chosen to amend the Environment Agency's 2013 River Waveney model by adding 2D sections rather than use the Environment Agency's improved 1D/2D hydraulic model of the River Waveney that was completed recently in 2022 and covers much of the area under consideration except for Gillingham. The method and the results of the models differ and this results in inconsistency between the two models. The two models map the same areas. The Environment Agency's 2022 model is of a higher quality and uses updated methods and input data. However, the LLFA notes this model is only for the fluvial reach of the River Waveney. The Environment Agency are currently undertaking a further study for the tidal extent of the river as part of the Broadlands Futures Initiative. There is no discussion in the report regarding this 6 year long study that is approximately halfway through its programme which has been running since autumn 2019. Further information about the Initiative can be found at https://www.broads-authority.gov.uk/looking-after/climate-change/broadland-futures-initiative

The LLFA notes that the Environment Agency in their initial response to the regulation 19 would consider the use of the LPA's hydraulic model as effectively a flood map challenge where the hydraulic model would likely be subject to review by the Environment Agency's Evidence and Risk Team for their approval before the model could be considered appropriate for use as evidence for the local plan.

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The LLFA is aware that conversations between the Environment Agency and the consultant (JBA) have occurred recently in April and May of 2023. The LLFA encourages the LPA to take the Environment Agency's additional responses on board in relation to the hydraulic modelling.

In addition, we remind the LPA of paragraph 160 of the National Planning Policy Framework (NPPF) that confirms that SFRAs should "take account of the advice from the Environment Agency and other relevant flood risk management authorities such as the lead local flood authorities and internal drainage boards." The LPA responses from May 2023 indicate the LPA are yet to take account of the advice provided by either the Environment Agency or the LLFA.

In relation to the responses that were provided in the email 18 May 2023, the LLFA is not satisfied the concerns that have been raised have been adequately addressed by the LPA or their consultant. A summary of the responses to our original comments can be found below with our further comments.

South Norfolk Level 2 SFRA Hydraulic Modelling Report (JBA, Dec 2022)

LLFA January 2023 Initial Comment: The LLFA have undertaken an initial review of the hydraulic modelling report. The report indicates the hydraulic model update is a strategic assessment with limited details included. While the model is coarse, this should not prevent an appropriate amount of method justification being provided. The information provided with the report is limited and there are many areas where better justification of modelling decisions should be provided. The main three areas of modelling concern at this time are outlined as:

- Where there is no existing 1D / 2D modelling, the modelling approach has been to coarsely stamp the tributaries into the geometry using the LiDAR and made the watercourse 3.5m wide modelling it in 2D only, rather than 1D / 2D. This is potentially over-estimating the size of the watercourse and there is not enough justification for applying this approach. This weakens the strength of the evidence base that the model aims to provide for the SFRA for assessing the suitability of these possible development sites. The LLFA notes that in the SFRA Addendum report it states the Level 2 SFRA objective is to

  "Provide individual flood risk analysis for site options using the latest available flood risk data". The LLFA is concerned the strategic level modelling of the River Waveney tributaries is too coarse to at present to achieve this objective.

- The updated hydraulic modelling does not contain any detailed hydrology. The justification provided in the report is that the work was simply "not in scope". There is no meaningful technical justification as to the reason for not undertaking and including detailed hydrology. This weakens the strength of the evidence base that the model aims to provide for the SFRA for assessing the suitability of these possible development sites.
- At Gillingham, the hydraulic modelling report has highlighted the possibility of a tidal flood risk. However, the hydraulic modelling report that covers the principle ordinary watercourses, confirms that no joint probability analysis has not been undertaken to

consider the joint flood risk from tidal and fluvial sources. Again, the justification provided in the report is that the work was simply “not in scope” and there is no meaningful technical justification for not undertaking the analysis and assessment. This weakens the strength of the evidence base that the model aims to provide for the SFRA for assessing the suitability of these possible development sites. **Please liaise with colleagues in the Environment Agency, if required, to resolve this matter.**

LPA Response: These models have been created to inform a strategic assessment in the absence of detailed modelling. Detailed modelling has a significantly greater time and budget implication and this is considered on a practicality basis to inform the SFRA. Similar approaches have been considered proportionate when undertaken to support local plan evidence bases for other local authorities. We will though add more clarity to this section that the modelling is strategic in nature and that the developer should use detailed modelling to inform a site-specific Flood Risk Assessment.

Specifically regarding the capacity of the channel, this would require a survey which would need to be done for the site specific FRA, and we will carry this through in the recommendations.

LLFA June 2023 Response: The LPA state there is an absence of detailed modelling. However, the Environment Agency completed their hydraulic modelling last year (2022) which could have been used for the SFRA to cover much of the area but has not. The new Waveney hydraulic 2022 modelling covers the River Waveney itself and the 2D modelled tributary at Needham. However, the River Waveney model does not cover the tributary areas at Brockdish and Gillingham that JBA modelled in 2D with standard 3.5m wide watercourses. The LPA have indicated that budgetary and financial constraints have limited the quality of model constructed, however they were able to fund the development of a model while aware that the Environment Agency were updating the hydraulic model. The indication of the LPA being willing to carry forward the need for additional surveying to incorporate into the model is seen as an acknowledgement by the LPA that the current hydraulic model is incomplete and not suitable for use at this time and yet they are prepared to use it as an incomplete evidence base for the Village Clusters plan (VCHAP). The LLFA recommends that either the appropriate amendments to the LPA’s hydraulic model are undertaken to meet the LLFAs concerns or where appropriate the updated Environment Agency modelling is used rather than the incomplete modelling that has been presented.

South Norfolk SFRA Addendum Report (JBA, December 2022)

LLFA January 2023 Response: The LLFA have undertaken an initial review of the South Norfolk SFRA Addendum Report. Overall, the LLFA requires a number of clarifications on the content of this report. It is clearly stated in the report that the latest NPPF Policy Planning Guidance (PPG), which was updated in August 2022, has not been applied to this SFRA addendum report or the SFRA in general. The LLFA is not able to find reasonable justification for this approach and requests a further clarification on this matter. Furthermore, the report states that the Level 2 SFRA objective is to

> *"Provide individual flood risk analysis for site options using the latest available flood risk data, thereby assisting the Council in applying the Exception Test to their proposed site options in preparation of the South Norfolk VCHAP."*

However, the latest guidance has not been applied which would undermine the value of such data. In addition, the addendum also states the Level 2 SFRA's objective to

> *"Take into account most recent policy and legislation in the NPPF, PPG and LLFA SuDS guidance"*

However, in the last paragraph of section 3.3 of the addendum report, it is indicated the Waveney Model was updated in 2022 to account for the updates PPG in relation to the Flood Zone 3b definition update. The LLFA requires clarification as this section contradicts the preceding statements that indicate the updated PPG and climate change guidance has not been applied in the report.

Furthermore, a review of the short paragraph in Section 2.6 does not seem to reflect the updates to the PPG. The LLFA notes that NPPF has not been discussed in the policy section. The LLFA recommends it is included or alternatively provide further clarification and justification as to why the NPPF has not been included as a relevant policy in the policy section of the addendum.

Section 3.4 on Climate change, there are a number of typos that are adding to the lack of clarity at the start of the section. For example, the peak rainfall central are quoted for "200s epoch" although when comparing to the latest peak rainfall allowances there is no 10% allowance for the 1% AEP. In addition, it is not clear why lower climate change allowances than those given in the most recent climate change guidance have been discussed.
At present it is not clear whether the correct climate change allowances have been applied to the updated hydraulic modelling for the applicant to state they have applied the latest climate change guidance. The LLFA is concerned about the lack of clarity within this section and requires this whole section to be clarified and updated.

In addition, the LLFA notes the climate change allowance that should be applied for the surface water is 45%. As while the applicant has correctly applied the selected epoch, they have not applied the relevant exception rule. The exception rule states;

- *"In some locations the allowance for the 2050s epoch is higher than that for the 2070s epoch. If so, and development has a lifetime beyond 2061, use the higher of the two allowances."*

In this location, the 1% AEP event for the 2050s epoch is 45%. Therefore, it is appropriate for this development to apply the 45% climate change allowance to the 1% AEP events.
In relation to the information available in section 4 of the addendum report, the LLFA notes that in section 4.2 the commercial development lifetime is misleading as this has now been updated to 75 years. While again in section 4.3 there is no discussion about the exception rule.

To add to the LLFA's confusion, in section 4.4 of the addendum report it is indicated that

> *"for this Level 2 SFRA, additional 2D Domains were added sections of the River Waveney (2013) model where this aligned with sites being assessed. The latest Central and Higher Central scenarios were modelled."*

Before going on to state that

> *"For any sites not covered by the EA's detailed modelling, Flood Zone 2 was used as an indicative climate change extent. This is appropriate given the 100-year +60% flows are often similar to the Flood Zone 2 extents; therefore, the impacts of climate change would be minimal."*

When previously in section 3.3 it is clearly stated the Waveney Model was updated in 2022 to account for the updates PPG in relation to the Flood Zone 3b definition update. Therefore, it remains unclear to the LLFA why the Flood Zone 3b climate change allowances were updated but other climate change allowances were not. Further justification is expected, although the LLFA would point out that the *"not within our scope"* response is not considered as an acceptable technical justification.

Again, in relation to inconsistency, clarity and technical justification to the application of the latest PPG and the updated climate change guidance. In section 4.6 of the addendum, the potential impacts of climate change on the functional floodplain are discussed vaguely. It is clear that no scientific analysis has been undertaken to define the impact of climate change on the functional flood due to the vague conjecture that is presented in the paragraph based upon the use of outdated flood zone 3b definitions. The latest PPG defines Flood Zone 3b as the 3.3% AEP (or 1 in 30 year) extent. In addition, section 4.6 of the Addendum advises the application of a climate change allowance (that is lower than the preceding climate change allowances) to the Flood Zone 3b extent for the 5% or even the 4% AEP with an unsubstantiated claim that this "may equate to a 75-year or 100-year flood event". While this approach may have been used historically, technical verification had been undertaken to determine whether this was possible. As both the flood zone 3b defined AEP event and the climate change allowances have changed significantly, updated scientific verification will be expected to support this claim. **Please liaise with colleagues in the Environment Agency, if required, to resolve this matter.**

Underlined Section 1:
LPA May 2023 Response: The 40% climate change allowances were applied to the surface water flood map for the Greater Norwich Level 2 SFRA previous to the change in climate change allowances. Due to the cost and time implication of re-running the surface water climate change allowances and the difference of 5%, this was not considered proportionate to re-run for a strategic study. The current datasets will allow areas at risk of flooding in the future to be identified. We will include further clarity in the South Norfolk Level 2 SFRA around the correct updated climate change allowances and that these should be used at site-specific Flood Risk Assessment.

LLFA June 2023 Response:
The Greater Norwich Level 2 SFRA was published in February 2021. The climate change allowances were updated in May 2022. There was time for the LPA to apply the updated climate change allowance to the new hydraulic model for the River Waveney that supports the Level 2 SFRA. As guidance and requirements change and become updated the LPAs are expected to update their evidence base in accordance with the guidance in place at the time. As indicated at the start of the letter, the Environment Agency would consider this as a new hydraulic model that would likely be a challenge to the flood map. Therefore, for the hydraulic model to be accepted the Environment Agency's Evidence and Risk Team would likely need to undertake a suitable leave of review on the model to determine

whether it is suitable for use. The LLFA recommends that either the appropriate amendments to the LPA's hydraulic model are undertaken to meet the Environment Agency's and the LLFA's concerns, alternatively where appropriate the updated Environment Agency 2022 modelling is used rather than the incomplete modelling that requires further work.

Underlined Section 2:
LPA May 2023 Response: As above, modelling to inform the SFRA is considered on a cost-beneficial basis and it is not always proportionate to re-run models for climate change due to the cost, age/stability of the model and number of sites. The Environment Agency updated the Waveney model to identify the updated FZ3b and provided this to us very shortly before our December 2022 submission. If the climate change has also been updated then we can consider this for sites on the Waveney.

LLFA June 2023 Response:
As previously discussed, the LLFA recommends that either the appropriate amendments to the LPA's hydraulic model are undertaken to meet the Environment Agency's and the LLFA's concerns, alternatively where appropriate the updated Environment Agency 2022 modelling is used rather than the incomplete modelling that requires further work. In addition, the LLFA notes the Environment Agency have clarified as part of separate correspondence, the Waveney 2022 model update was a full standalone update programme, with a full range of return periods modelled. The Environment Agency has confirmed the updated modelling was not undertaken to identify the new flood zone 3b. Therefore, part of the LPA's response is incorrect.
Furthermore, the LLFA notes that SFRAs are living documents that should be updated regularly to reflect changes in the policy and industry requirements.

LLFA January 2023 Response: The LLFA expects the model to be updated with the correct climate change allowances and appropriate updates are then made throughout the report. Furthermore, the LLFA expects the Addendum report to be updated to provide better clarity on the reporting of the work undertaken and the associated results.

The LLFA notes that the updated NPPF confirms

> *"the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the Strategic Flood Risk Assessment when considering location and potential future flood risks to developments and land uses."*

However, as the SFRA has a confusing and at times what appears to be a contradicting approach to the application of climate change, the LLFA has concerns about whether the SFRA addendum will be able to clearly provide that information as an evidence base to developers and planners.

The LLFA has reviewed a selection of the sites identified in Table 5-1 and in the Hydraulic Modelling report. The LLFA is concerned there are a few sites that under the updated PPG would be unlikely as appropriate to consider for development. However, the wording around the site potential for developments appears to either infer doubt on the modelled results or rather optimistic compared to the modelled flood extents for both fluvial and

surface water sources, such as at SN0274RevB and SN2183. As there has been no significant changes in the hydraulic modelling for either fluvial, tidal or surface water mapping that the SFRA is based upon, it is not clear to the LLFA based on the information in the addendum whether the previous LLFA site specific advice has been applied. The LLFA notes that it is not clear from the report whether consultation with the Environment Agency was undertaken for the fluvial sites and the outcome of that consultation either.

LPA May 2023 Response: None

Informative – In December 2022 it was announced the FEH rainfall data was updated to account for additional long term rainfall statistics and new data. As a consequence, the rainfall statistics used for surface water modelling and drainage design has changed. In some areas there is a reduction in comparison to FEH2013 and some places an increase (see FEH22 - User Guide (hydrosolutions.co.uk)). The LLFA advises that future flood risk assessment activities should use the most up to date FEH22 data. For the avoidance of doubt, the use of FSR and FEH1999 data has now been superseded by FEH 2013 and 2022.

LPA May 2023 Response: None

Yours sincerely,

Sarah

Sarah Luff
Strategic Flood Risk Planning Officer

Lead Local Flood Authority