

Kelly Tolhurst Rochester and Strood

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Our reference: EC13855

Date: 22 April 2022

Dear Kelly,

Re: Thames Barrier

Thank you for your further correspondence dated 1 April 2022 regarding flooding on the Medway in February 2022.

In respect to what studies have been done to understand the effect Thames Barrier Flood Defence Closures have on the wider estuary, I can confirm that detailed modelling exists, showing levels down the Thames Estuary under barrier closed and open scenarios for a variety of return periods (this modelling was recently updated). I have included an extract of this information (on the attached spreadsheet) for the Thames Barrier and the bottom of the estuary. You can see that during a Thames Barrier closure, river levels immediately downstream of the barrier are increased by approximately 0.1 to 0.2m (for lower order events), however by Leigh-on-Sea/Allhallows-on-Sea this has reduced to around 0.1m and by the final node point of the model (node 3.38 on attached map), Southend/Isle of Grain, this has reduced to zero. This means that any effects of the Thames Barrier closing do not reach up the River Medway. Although extreme surge events do cause a higher initial level at the Thames Barrier, these too reduce to zero by Southend/Isle of Grain.

Regarding the co-incidence of tidal surges, Thames Barrier closures and effects on the Medway, I would like to explain that the Thames Barrier operates to protect London from a large tidal surge coming up the Thames estuary (that same surge would also progress up the River Medway). Therefore, the same conditions that drive flooding on the River Medway will also determine the operation of the Thames Barrier. This does not mean that the Thames Barrier causes the flooding on the Medway, rather that it is the result of the large tidal surge.

Without more detail on which locations you are referencing in your email, it is difficult to provide specific information to allay your concerns. However, please note that a number of factors can affect total water levels at any given location, such as: shape of surge, fluvial inputs and wind direction.

Whilst the 21 February 2022 surge event was the highest since December 2013 (as measured at Southend and Sheerness), levels were higher in the estuary during the

February event, for example at Snodland and Maidstone Town Centre. Like on the River Thames, total water levels on the River Medway are a combination of fluvial flow coming down the Medway and the tide coming up. Peak levels where we have data (in the Allington to Snodland reach) on 21 February were the highest seen in a number of years, this may be due to the fact that fluvial/river flows on the Medway were a lot higher on 21 February 2022 than they were in December 2013. If the Thames Barrier closure had been the cause of the flooding in February, it would also have caused higher levels at Sheerness but as it didn't, the extra water between Allington and Snodland must have come from somewhere other than the Thames estuary or the North Sea (i.e. the fluvial flow). Therefore, it was the combination of high tide (large surge) and high fluvial river flows that caused the particularly high levels observed in February. The effects of wind direction should also not be underestimated and could have been a contributing factor.

It is important to me that you have the highest level of confidence in the operation of the Thames Barrier both in terms of it serving its core purpose but also in terms of impact elsewhere. I am particularly concerned to ensure this is the case given the feedback you have had from local stakeholders and given the EA's wider role to limit flood risk more widely. As per my previous offer if you feel it would be of benefit, I would be very happy to arrange a visit to the Thames Barrier for you, where we could explain our operations further and answer any further questions you have. Please do let me know if this would be of interest to you.

If you would like to discuss these matters further please do not hesitate to contact me at sally.harvey@environment-agency.gov.uk.

Yours sincerely



Sally Harvey
Area Director – Kent, South London and East Sussex