

From: Hilary Ellis
Sent: 01 June 2021 16:57
To: 'Nolan, Sharon' <[REDACTED]>; Pickering, Jack
[REDACTED]
Cc: Craig Campbell [REDACTED]; Joely Norris
[REDACTED]
Subject: RE: A47 Improvement Schemes – Wansford

Good afternoon Jack,

I can confirm that the LLFA is also satisfied with WinFap being used for this.

Kind regards,
Hilary

Hilary Ellis
Flood Risk & Biodiversity Business Manager (Acting)
Cambridgeshire County Council
[REDACTED]



From: Nolan, Sharon [REDACTED] >
Sent: 01 June 2021 14:49
To: Pickering, Jack [REDACTED]
Cc: Craig Campbell [REDACTED]; Hilary Ellis
[REDACTED] >; Joely Norris [REDACTED]
Subject: FW: A47 Improvement Schemes – Wansford

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Hi Jack

The Evidence and Risk team have confirmed that they are happy with the WinFap approach, as generally these estimates can be trusted a bit more as they are derived from observed flow data on comparable catchments. Supplying the model runs with ReFH 2.3 is also very useful as it will highlight the flow uncertainties in the ungauged area.

If I can be of any further assistance please do not hesitate to contact me on the number below.

Kind regards,

Sharon Nolan
Planning Advisor

Our team mail box has changed to LNplanning@environment-agency.gov.uk

Lincolnshire and Northamptonshire Area

Environment Agency

Nene House, Pytchley Lodge Road, Kettering, NN15 6JQ



From: Pickering, Jack [redacted]
Sent: 20 May 2021 11:05
To: Nolan, Sharon [redacted]; Hilary.Ellis
[redacted]
Cc: Craig Campbell [redacted]; Joely.Norris
[redacted] Ball, Jason [redacted]
Subject: RE: A47 Improvement Schemes – Wansford

Hi Sharon,

Please can you confirm with the E&R Team that our final approach is acceptable as per the below: We've amended the approach to use the Winfap estimates as it is the preference of the E&R team, however, we have included both the ReFH2.3 and Winfap results in the report. The Winfap estimates reduced the overall detriment to flood levels on the floodplain. Hilary, please could you confirm in writing this is acceptable. Previously you agreed 200mm was acceptable based on no receptors. We are reducing this to approximately 50mm detriment. I assume this is ok but need it in writing.

Sharon, this was the previous response from the E&R Team, please could you also confirm in writing you are happy with Winfap being used for the final inflows, the results of both ReFH2.3 and Winfap have been provided in the final FRA Flood Maps for completeness. I've not resent this due the FRA previously having been accepted. I'm happy to resend this if you want to review it.

Comments from E & R Team

I've read through their comments and checked the supplied documents. I'm happy with all of the amendments.

I think the main thing that needs to be OK'd is the hydrology for Wittering Brook. From our guidance notes, we generally advise that the WINFAP derived flows provide a better estimate. Observed data are integrated into the assessments, which can generally give greater confidence. The ReFH 2.3 method that's been applied here has provided flow estimates larger than the WINFAP method which was why I queried their use. However as this is being used for the design of the scheme and it's an ungauged catchment, I can understand taking the more conservative approach may be appropriate

in this case and am happy for them to use this. It's better to be over precautionary and over design rather than under.

Kind Regards,

Jack Pickering C.WEM
Principal Consultant
Flood and Water Management

[REDACTED]
[REDACTED]
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From: Nolan, Sharon [REDACTED]
Sent: 15 April 2021 12:22
To: Pickering, Jack [REDACTED]
Subject: FW: A47 Improvement Schemes – Wansford
Importance: High

Hi Jack

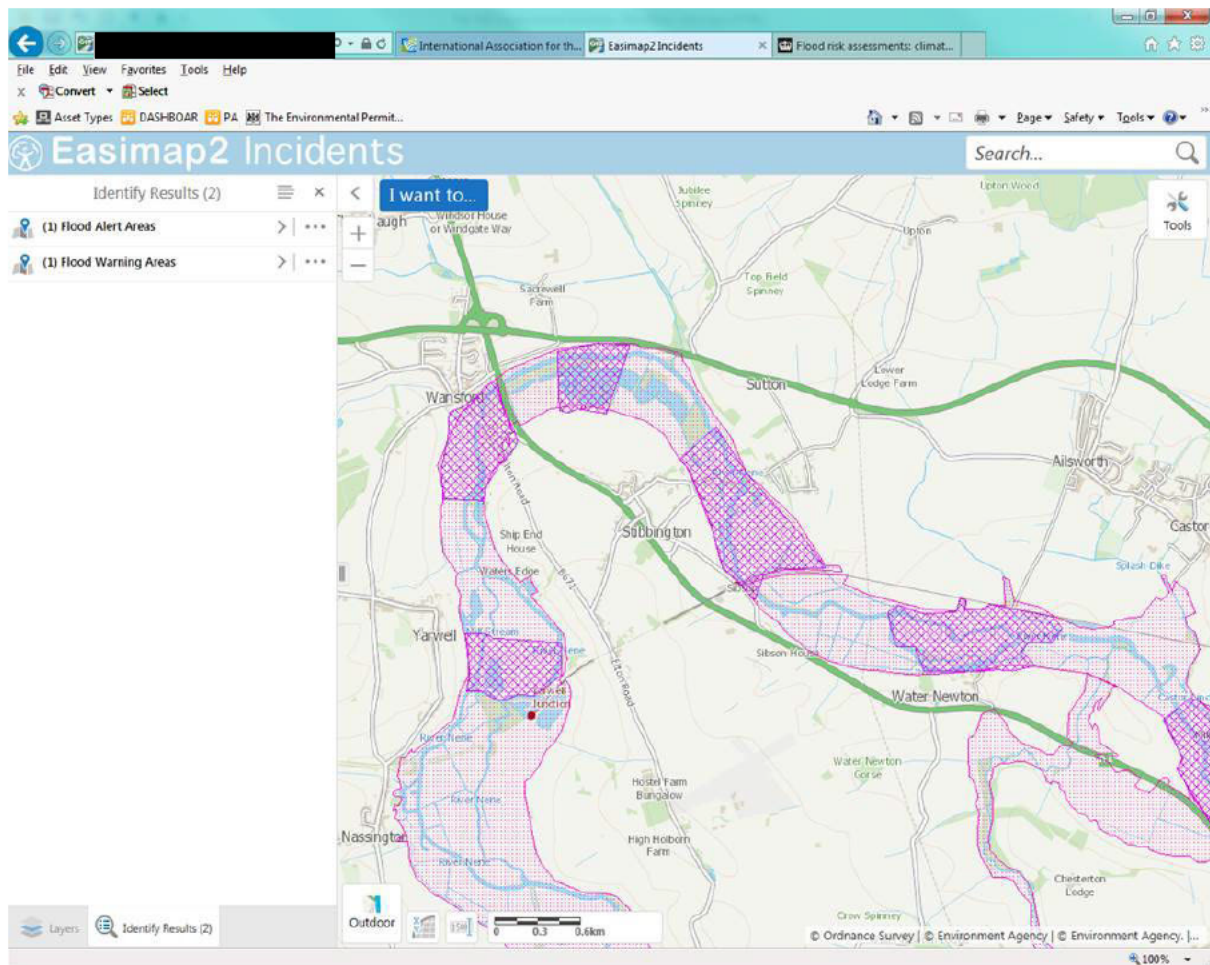
Comments from E & R Team

I've read through their comments and checked the supplied documents. I'm happy with all of the amendments.

I think the main thing that needs to be OK'd is the hydrology for Wittering Brook. From our guidance notes, we generally advise that the WINFAP derived flows provide a better estimate. Observed data are integrated into the assessments, which can generally give greater confidence. The ReFH 2.3 method that's been applied here has provided flow estimates larger than the WINFAP method which was why I queried their use. However as this is being used for the design of the scheme and it's an ungauged catchment, I can understand taking the more conservative approach may be appropriate in this case and am happy for them to use this. It's better to be over precautionary and over design rather than under.

Comments from flood risk team

I have reviewed the FRA and have no further comments other than;
We would expect the FRA to be updated, as described, in line with the information provided in the email from Jack Pickering dated 31 March 2021, specifically in relation to floodplain compensation volumes. The FRA should include the floodplain compensation calculations and cross sections. The FRA in section 8.3.8 states that the scheme is not within an area that receives flood warnings/alerts but it is judging by the map below:



If I can be of any further assistance please do not hesitate to contact me on the number below.

Kind regards,

Sharon Nolan
Planning Advisor

Our team mail box has changed to LNplanning@environment-agency.gov.uk

Lincolnshire and Northamptonshire Area
Environment Agency
Nene House, Pytchley Lodge Road, Kettering, NN15 6JQ





Creating a better place
for people and wildlife



From: Pickering, Jack [REDACTED]
Sent: 31 March 2021 17:10
To: Nolan, Sharon [REDACTED]
Subject: A47 Improvement Schemes – Wansford

Hi Sharon,

Thank you for the response to the Wittering Brook hydrology, River Nene hydrology and model review. We have addressed the comments below and would be grateful if these can be passed on to the E&R team.

Hydraulic model

I think I'm generally happy with everything shown in the hydraulic report. They've carried out some pretty thorough sensitivity testing which I'm very grateful for, at the moment I have only a couple of queries on the hydraulic modelling.

- *One of their sensitivity tests was to use a 50yr stage as the d/s boundary, I would query where this has come from as we could probably get values from the existing Nene model for this. The 50-year stage as the downstream boundary to the Wittering Brook model was taken from the River Nene model. The hydraulic model report has been updated to include this for clarity.*
- *As the proposed culverts are larger than the existing, I would also query whether any flows from the main Nene could have any impacts u/s. The section of model reach downstream of the A47 culvert is very steep, with a slope of 1/100. The model was re-run with the proposed culvert for a 100-year plus 65% event with a 50-year d/s boundary. The addition of the d/s boundary corresponded to minimal increase in depth to the next upstream cross-section. However these effects did not propagate upstream and no increase in depths were observed to other upstream cross-sections.*

Hydrology

Please find attached my hydrology review.

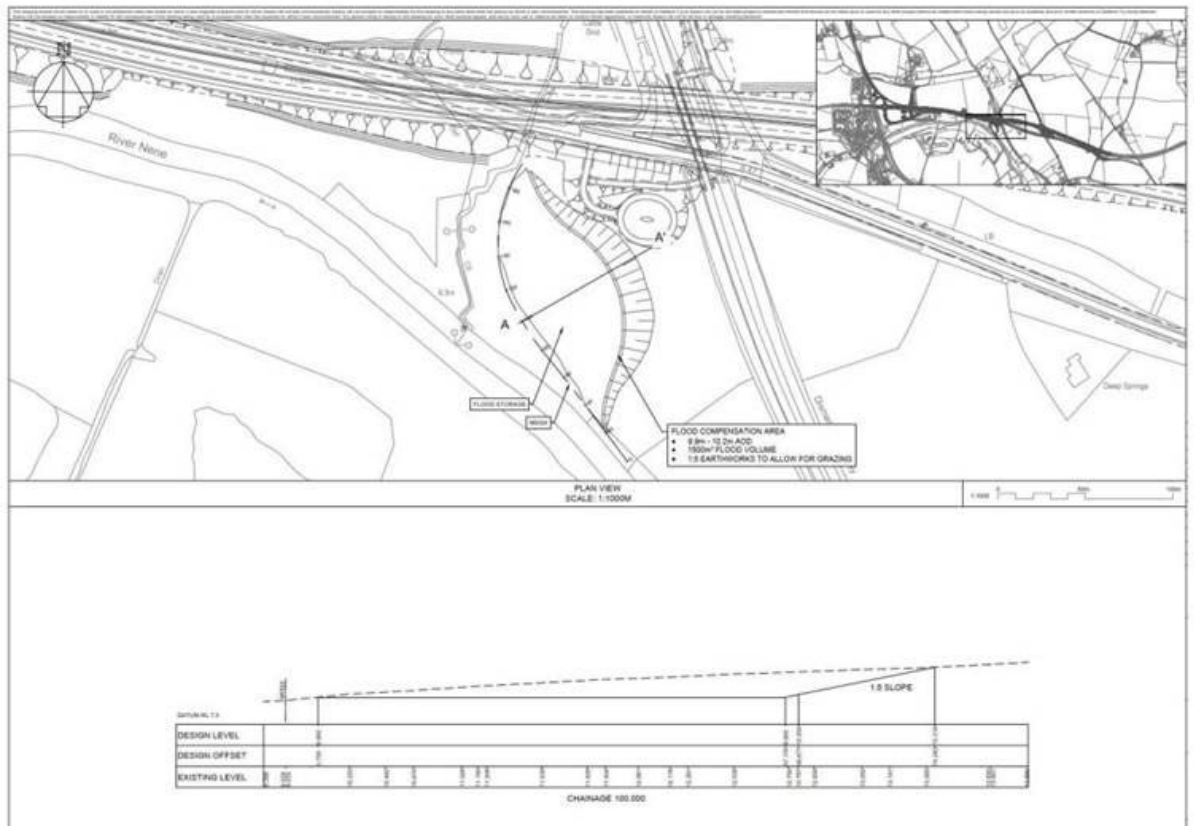
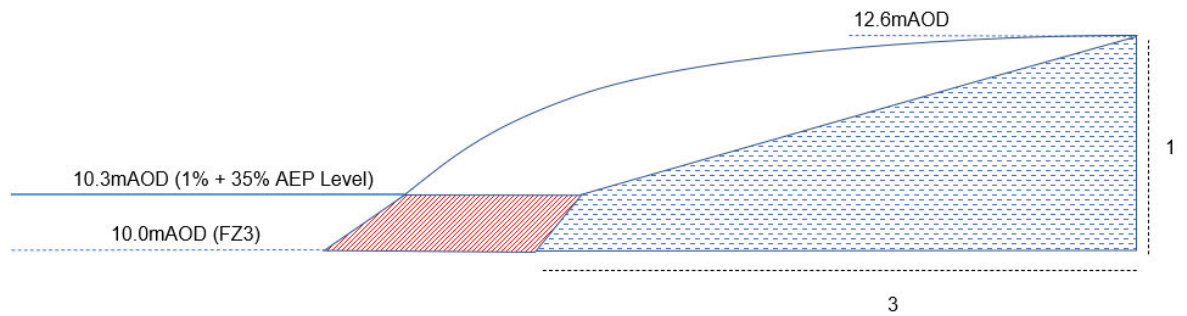
- *I have a couple of red comments regarding their choice of methodology, they've used ReFH2.3 whereas I think the FEH methods would be more suitable. Though the FEH flows are lower, they use actual observed data so we have a general preference for them. We can't normally justify using a method just because it produces higher flows, more clarification is*

required about this. As it is they seemed to have put a lot of effort into their FEH approach for the comparison which is also appreciated, these permeable ungauged catchments can be quite tricky to produce reliable flow estimates for. A hybrid method was chosen as the initial Wittering Brook hydrology to the model, however upon review it was decided to adopt the Refh2.3 design flows. The decision to use the higher RefH2 inflows was used to inform a conservative design level for the structures design.

- The model has been re-run using the WINFAP hydrology by adopting a hybrid method to scale the ReFH2.3 hydrographs. See attached for flood depth maps for the baseline/option scenarios plus detriment mapping for all design events. The predicted noticeable difference between the hydrology is the variation in flood depths across the Wittering Brook floodplain. The WINFAP hydrology (lower flows) has meant there is less betterment observed in the floodplain as a result of the proposed culvert. On average the predicted detriment across all design flood events is approximately 50mm. For lower order events (10-year) the 50mm detriment is predicted across a larger area of the floodplain however this is partly due to mesh elevation averaging. These areas are represented in the figures as the yellow and light green triangles with ranges of +/- 5cm. For higher order events, betterment is generally observed across more of the floodplain.
- Please see attached for our responses to the hydrology review.

River Nene Flood Impact Study

- The volume of flood plain which will be lost by constructing the Proposed Scheme was calculated using 'Triangulated Terrain Surfaces' in MX Road Design software (Bentley, 2021). Initially, a boundary beyond the extents of the location where the bottom of the earthworks meets the flood level was taken. The volume from the existing ground level to the design level within the boundary was then calculated. The calculation was repeated from the Proposed Scheme surface to the flood level. The difference between the two, the lost volume from the Proposed Scheme, was calculated to be 1799m³.
- The volume of compensation to be provided is 1799m³. The reason why it appears the volume of the scheme is significantly larger than that of the compensation is due to the regrading of the slope. The location chosen for compensation would be excavated into a steep embankment with a regraded slope of 1:3. The hatched area shown in the figure represents the area required for compensation inclusive of the regraded slope up to a tie in level of 12.6mOAD. See the modified figure from the River Nene Flood Impact Study below. The compensation is provided from FZ3 up to the design level represented as the purple line in the figure below. Any hatched area uphill of the purple line is therefore regraded material and not compensated volume.
- It is confirmed that excavation of the compensation is completed before construction of the scheme commences.
- Please see attached for our response to the hydrology review.



Please let us know what the EA hydrology preference is for the Wittering Brook for us to progress with. I have also attached the draft FRA for your review if you could reply with any queries that would be very helpful. I haven't attached the annexes as they are just the modelling reports already reviewed. If you could try to get back any comments by Friday 16th April it would be much appreciated. The programme is a tight as ever with this one!

Kind Regards,

Jack.

Leeds, LS7 4DN
+44 113 262 0000

From: Nolan, Sharon [REDACTED]
Sent: 10 March 2021 16:10
To: Vivian, Richard [REDACTED]; Pickering, Jack [REDACTED] >
Subject: RE: A47 Improvement Schemes – Wansford

Hi Richard and Jack

I have just spoken to the E & R team.

They confirmed they have reviewed the Wittering Brook hydraulic model report and the hydrology. Their comments on the on the hydraulic report are in the advice letter (attached) but I have copied these comments directly below (for clarity) and a detailed review sheet of the hydrology as attached.

Hydraulic model

I think I'm generally happy with everything shown in the hydraulic report. They've carried out some pretty thorough sensitivity testing which I'm very grateful for, at the moment I have only a couple of queries on the hydraulic modelling.

One of their sensitivity tests was to use a 50yr stage as the d/s boundary, I would query where this has come from as we could probably get values from the existing Nene model for this. As the proposed culverts are larger than the existing, I would also query whether any flows from the main Nene could have any impacts u/s

Hydrology

Please find attached my hydrology review.

I have a couple of red comments regarding their choice of methodology, they've used ReFH2.3 whereas I think the FEH methods would be more suitable. Though the FEH flows are lower, they use actual observed data so we have a general preference for them. We can't normally justify using a method just because it produces higher flows, more clarification is required about this. As it is they seemed to have put a lot of effort into their FEH approach for the comparison which is also appreciated, these permeable ungauged catchments can be quite tricky to produce reliable flow estimates for.

They will review the River Nene Impact Study and the Hydrology. Outputs should be similar to what there was for Wittering Brook.

They have estimated 8 hours to review the River Nene impact study and the hydrology and will complete next week and I will send out to you both.

Please accept our apologies for this oversight.

Please can you confirm you accept the cost estimate which will be £800 plus VAT and also confirm you are happy with what we propose.

If I can be of any further assistance please do not hesitate to contact me on the number below.

Kind regards,

Sharon Nolan
Planning Advisor

Our team mail box has changed to LNplanning@environment-agency.gov.uk

**Lincolnshire and Northamptonshire Area
Environment Agency**
Nene House, Pytchley Lodge Road, Kettering, NN15 6JQ



From: Nolan, Sharon
Sent: 10 March 2021 14:21
To: Vivian, Richard
Cc: Pickering, Jack
Subject: RE: A47 Improvement Schemes – Wansford

Hi Richard

Yes of course.

Here are the files that we have reviewed to date:

HESS1494-GTY-EWE-000-CA-LE-30001	24/12/2020 09:04	Microsoft Excel W...	4,543 KB
HESS1494-GTY-EWE-000-CA-LE-30002	24/12/2020 09:04	Microsoft Excel W...	12,617 KB
HESS1494-GTY-EWE-000-CA-LE-30003	24/12/2020 09:04	Microsoft Excel W...	717 KB
HESS1494-GTY-EWE-000-CA-LE-30004	24/12/2020 09:04	Microsoft Excel 97...	553 KB
HESS1494-GTY-EWE-000-CA-LX-30001	24/12/2020 09:04	Microsoft Excel 97...	604 KB
HESS1494-GTY-EWE-000-RP-LE-30002	24/12/2020 09:05	Microsoft Word D...	36,437 KB
HESS1494-GTY-EWE-000-RP-LE-30003	24/12/2020 09:05	Microsoft Word D...	7,174 KB
HESS1494-GTY-EWE-000-RP-LE-30004	24/12/2020 09:05	Microsoft Word D...	764 KB
HESS1494-GTY-EWE-000-RP-LE-30006	24/12/2020 09:05	Microsoft Edge P...	19,468 KB

I will be able to have a chat between 3 and 4pm.

Kind regards
Sharon

Kind regards,

Sharon Nolan
Planning Advisor

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Nene House, Pytchley Lodge Road, Kettering, NN15 6JQ



From: Vivian, Richard [REDACTED]
Sent: 10 March 2021 13:59
To: Nolan, Sharon [REDACTED]
Cc: Pickering, Jack [REDACTED]
Subject: RE: A47 Improvement Schemes – Wansford

Hi Sharon,

Would you mind if we had a brief phone call to discuss what has been reviewed by the EA? There may be discrepancies between what we are expecting to receive and what has been reviewed.

Thanks,

Richard Vivian
Graduate Hydrologist

[REDACTED]

[REDACTED]

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[REDACTED]



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From: Nolan, Sharon [REDACTED]
Sent: 10 March 2021 13:04
To: Vivian, Richard [REDACTED]
Cc: Steiger, Cassandra [REDACTED]; Pickering, Jack
Subject: RE: A47 Improvement Schemes – Wansford

Hi Richard

I am a bit confused following your email.

Jack advised that you were missing the Hydrology review of the Wittering Brook and sent me a file transfer link.

Kind regards,

Sharon Nolan
Planning Advisor

Our team mail box has changed to LNplanning@environment-agency.gov.uk

**Lincolnshire and Northamptonshire Area
Environment Agency**
Nene House, Pytchley Lodge Road, Kettering, NN15 6JQ



From: Vivian, Richard [REDACTED]
Sent: 10 March 2021 11:32
To: Nolan, Sharon [REDACTED]
Cc: Steiger, Cassandra [REDACTED]; Pickering, Jack
Subject: RE: A47 Improvement Schemes – Wansford

Hi Sharon,

As per the email below we have still only received an audit sheet for the Hydrology review of the Wittering Brook and not for the model or River Nene Flood Impact Study. If these have been reviewed can you please send them to us so we can make our updates as appropriate.

The Evidence and Risk (E&R) comments

Overall they were satisfied with everything shown in the hydraulic report but they have a couple of queries on the hydraulic modelling.

One of the sensitivity tests was to use a 50yr stage as the d/s boundary, they query where this has come from as values could be attained from the existing Nene model for this.

As the proposed culverts are larger than the existing, they query whether any flows from the main Nene could have any impacts up stream.

I have attached a copy of the detailed review of the hydraulic model completed by the E&R team. Comments flagged in red mean the identified omissions could make the findings subject to challenge and which requires correction / further work

We advise these issues need addressing and resolving before a formal submission to the Local Planning Authority.

Kind Regards,

Richard Vivian
Graduate Hydrologist

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From: Pickering, Jack [redacted]
Sent: 04 March 2021 15:52
To: Nolan, Sharon [redacted]
Cc: Steiger, Cassandra [redacted]; Vivian, Richard
Subject: RE: A47 Improvement Schemes – Wansford

Hi Sharon,

As part of the EA review we were expecting a hydrology review for the Nene Model as well as a model build audit for the Wittering Brook. Could you confirm if these are still in review / when I might receive those?

Kind Regards,

Jack Pickering C.WEM
Principal Consultant
Flood and Water Management

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From: Nolan, Sharon [REDACTED]
Sent: 04 March 2021 10:45
To: Pickering, Jack [REDACTED]
Cc: Steiger, Cassandra [REDACTED]
Subject: A47 Improvement Schemes – Wansford

Dear Jack

Please find attached a copy of the Environment Agency's response for your request for planning advice under our cost recovery service.

If I can be of any further assistance please do not hesitate to contact me on the number below.

Kind regards,

Sharon Nolan
Planning Advisor

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