



One Earth Solar Farm

Volume 6.0 Environmental Statement [EN010159]

Volume 3: Technical Appendices Supporting ES Volume 2

Appendix 7.3 Full Details of Consultation Comments – Meeting Minutes

February 2025

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Revision 01

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009
- Reg 5 (2) (a)

One Earth Solar

Flood Risk Meeting

Date:	13 th September 2023	
Time:	14:00	
Location:	Virtual Teams Meeting	
Attendees:	██████████) – Environment Agency	██████████ – Pershing Consultants
	██████████ – Environment Agency	██████████ - Logika
	██████████ – Environment Agency	██████████ - Logika
	██████████ – DWD Planning	██████████ - Logika
	██████████ – Tony Gee and Partners	

Ref	Commentary	Action
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1.0 Project and Proposals Overview

1.1 GP provided an overview of the existing Site, the solar farm proposals and indicative scheme timelines.

1.2 JM requested clarification on whether the proposals are considered to be Nationally Significant Infrastructure and therefore require a Development Consent Order (DCO) application. GP confirmed that this was correct and JM/PG therefore indicated the project may be transferred to the EA's National Team. It was agreed however that JM/PG would confirm this internally. **EA**

2.0 Summary of Current Flood Risk and Proposed Mitigation

2.1 CT highlighted that the Site is located on either side of the River Trent and large areas therefore lay within Flood Zone 2 and 3 indicating a medium and high probability of flooding from the River Trent and its tributaries.

CT indicated that the assessment of flood risk to date has been based on the modelled data provided by the EA. This included results from the defended fluvial and tidal scenarios associated with the River Trent. Based on the modelling results provided by the EA, the fluvially dominated flood

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extents are considered to be the worse and have therefore been used in determining the design flood event.

CT indicated that on the basis that the proposals comprises a nationally significant solar farm, the development is considered to be essential infrastructure and therefore is acceptable within the floodplain however a sequential approach to the layout and mitigation is to be provided (discussed in more detail below). Members from the EA confirmed this was acceptable.

CT shared a map of the fluvial flood extents for a number of scenarios and highlighted that in line with current EA climate change guidance, the higher central allowance of 39% should be considered. The design flood event is therefore the fluvially dominated 1 in 100 year plus 39% climate change scenario which will be considered when assessing any mitigation proposals. The EA agreed that this is the correct climate change value and that the design event was correct.

CT shared depth mapping for the design flood event and highlighted that flood depths across the Site vary however in some areas can be greater than 4m (in areas close to the River Trent and in front of the existing flood defences).

A map illustrating depths of flooding greater than 1.5m in the design flood event was shared by CT who indicated that in general, solar panels will not be proposed within these areas. CT indicated however that solar panels within the flood extents will be raised on frames to be 1.8m above ground levels therefore ensuring that a minimum of 300mm freeboard is provided between the lowest point of the panel and the flood level. The EA indicated that this approach was considered acceptable for the design flood event.

HB indicated that although the EA are in agreement with the freeboard allowance above the design flood event, a similar freeboard allowance above the breach flood levels should also be provided where feasible.

CT indicated that although the EA have provided some model results from the breach event, there are still some items which require clarification and additional information is required. It was agreed that Logika will raise their queries on this directly with the EA separately to ensure that the breach scenario can be considered appropriately.

Logika

Furthermore, CT noted that the breach scenario is a residual event and although is considered in the design, it is not ordinarily required to raise the solar panels above the breach flood levels. The EA acknowledged this however indicated that in the first instance, they would like the potential for freeboard above the breach flood levels to be assessed.

CT indicated that once full breach data is received an assessment of the levels and impact on the solar panels can be undertaken and the potential for freeboard to be provided discussed subsequently.

Logika

With regards to the remainder of the Site, CT indicated that a sequential approach to the development layout is being taken by locating fundamental infrastructure and any more vulnerable uses (such as battery storage, substations or welfare) within the Flood Zone 1 areas. The EA confirmed they were in agreement with this approach.

CT indicated that the aim across the Site is to maintain existing ground levels wherever possible with no raising of land to avoid the need for floodplain compensation. If land raising should be required in localised areas however, appropriate floodplain compensation assessments will be undertaken. The EA noted this and were in agreement.

Watercourse and Flood Defence Considerations

HB queried whether offsets to the watercourses and defences on site have been considered in the current layouts and indicated that given there is a slight tidal influence to the River Trent, this offset could be up to 16m.

CT indicated that offsets to both ordinary watercourses and the River Trent have been considered at high level in the production of the masterplan. However to date, a minimum of 8m has been provided on the basis that the influence is predominantly fluvial. CT confirmed however that checks would be undertaken to confirm the offsets currently provided and it was also agreed that the EA would confirm the easements required.

Logika/EA

PG queried whether the condition assessments of the existing flood defences were provided by the EA as part of the Product 4 data set. CT indicated that based on the scale of the Site, the EA did not understandably provide their Product 4 responses which would normally include some of this information. PG/HB indicated that they will request this information from the EA's asset management team.

EA

Any Other Business

- 5.1 PG queried whether any cable routing above or below the River Trent would be required as these may require appropriate permits to be submitted. GP indicated that this would be required and that optioneering is currently being undertaken to confirm the arrangement. It was indicated however the environmental permitting will be considered as part of any final agreed options.

Since the Site spans across two EA management areas, CT questioned whether contact needs to be made with the Lincolnshire-Northamptonshire EA office. JM clarified that this has been discussed

between the offices and it has been agreed that the East Midlands office will be leading on this and will be the main point of contact (subject to confirmation regarding the EA National Team).

JM indicated that the EA have some policy relating to emergency planning in the event of a fire in battery storage areas. It was agreed that the EA would forward information on this as appropriate. **Logika**

PG queried what the position is with regards to BNG currently. GP indicated that this is being led by Logika and that work is ongoing, however the Site is largely arable land and is not highly diverse in terms of habitats. JM indicated that BNG with a 10% net gain will be compulsory from November 2023, and given the timeframes of this project and submission, it should be considered. GP noted that BNG assessments will be undertaken in line with the latest policy requirements.

One Earth Solar

Second Flood Risk Meeting with Environment Agency

Date:	27 th February 2024	
Time:	14:00	
Location:	Virtual Teams Meeting	
Attendees:	██████████ - Environment Agency	██████████ – Aecom
	██████████ – Environment Agency	██████████ - Logika
	██████████ – Environment Agency	██████████ - Logika
	██████████ – Pershing Consultants	██████████ - Logika
	██████████ – Iceni	

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1.0 Project and Proposals Overview

- 1.1 CT led introductions and indicated that the purpose of the meeting was to provide an update to the Environment Agency (EA) of the development proposals as well as any updates to the approach to flood risk management since our previous meeting in September 2023.
- 1.2 SG provided an overview of the aims of the project and the indicative masterplan as it stands. In particular, SG highlighted where constraints are to development to provide context of how the masterplan has been worked up.

2.0 Summary of Baseline Flood Risk

- 2.1 On the basis that the project now sits with the National Infrastructure Team within the EA, CT indicated that he would provide a brief overview of the baseline conditions and flood risk at the Site.

CT highlighted that the Site is located on either side of the River Trent and large areas lie within Flood Zone 2 and 3 indicating a medium and high probability of flooding from the River Trent and its tributaries. It was noted however that there are large areas that are shown to have a reduction in flood risk as a result of the defences present.

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CT indicated that the assessment of flood risk to date has been based on the modelled data provided by the EA (the River Trent Model 2023). This included results from the defended fluvial and tidal scenarios associated with the River Trent. Based on the modelling results provided by the EA, the fluvially dominated flood extents are considered to be more significant and have therefore been used in determining the design flood event.

CT indicated that on the basis that the proposals comprise a nationally significant solar farm, the development is considered to be essential infrastructure and therefore is acceptable within the floodplain however a sequential approach to the layout and mitigation is to be provided (discussed in more detail below). Members from the EA confirmed this was acceptable.

CT indicated that based on the EA climate change guidance, the higher central allowance of 39% should be considered to account for increases in river flows in the future. The design flood event is therefore the fluvially dominated 1 in 100 year plus 39% climate change scenario which will be considered when assessing any mitigation proposals. The EA agreed that this is the correct climate change value and that the design event was correct.

CT shared a figure illustrating the flood extents for the design flood event and indicated that this generally sits between Flood Zones 2 and 3.

CT then shared depth mapping for the design flood event and highlighted that flood depths across the Site vary from greater than 4m in areas close to the River Trent to less than 0.5m further away, where ground levels are higher.

3.0 Approach to Flood Risk Management/Mitigation

With regards to the design flood depths, CT indicated that there will be no solar development proposed in the areas where depths are significant, close to the River Trent. This is on the basis that it is not feasible from a visibility or engineering perspective to raise the panels to significant heights, above the flood water.

CT noted that in general, panels will be designed such that their base will be raised 750mm above the ground level as a minimum. However, in line with the approach set out in the first meeting, it is proposed that panels will be raised further where flood depths are greater.

CT indicated that in line with the previous discussions, the maximum height that the base of the panels can be raised to is 1.8m. The potential for further raising was assessed, however due to visual impact, engineering considerations (with deeper foundations) and the need for associated maintenance, 1.8m is considered to be the maximum achievable.

CT indicated that a 300mm freeboard above the flood levels (for the design flood event) has been aimed for. With this in mind, the maximum water depth assessed to inform the masterplanning is 1.5m. CT shared a figure illustrating the extents of flooding in the design event that are greater than 1.5m along with the illustrative solar layout.

Referring to the figure, CT indicated that in general, development within the areas of flooding greater than 1.5m will be avoided. However, there are some locations where this cannot be achieved, namely to the east in the vicinity of the unnamed watercourse and directly to the west of the River Trent. For clarity, CT noted that approximately 94% of the Site would either not experience flooding or will be raised 300mm above the design flood levels.

Although some solar panels are to be provided within the areas of flooding greater than 1.5m (to the east in the vicinity of the unnamed watercourse directly to the west of the River Trent), CT indicated that a freeboard would still be provided for large areas in these locations, it is just that the freeboard is less than 300mm (as illustrated by the orange hatch within the freeboard and depth flooding figure).

CT noted however that in some localised areas, the base of the panels would be subject to flooding, even when raised to 1.8m (as illustrated by the pink to blue hatching in the freeboard and depth flooding figure). CT indicated that the maximum depth of flooding above the base of the panels would be within the range of 300-600mm.

It was indicated by CT however that the areas where flooding above the base of the panels could occur constitutes approximately 2% of the total solar development and is therefore considered to be a minor area. CT noted that the design team and client were comfortable with the impact that any minor flooding in these areas could have on the development and the operational capacity.

SL indicated that the approach taken to mitigation is agreed by the EA and noted that measures had clearly been taken within the masterplanning process to ensure that robust mitigation is provided to as much of the Site as possible.

4.0 Consideration of Residual Flood Risk (Breach)

CT indicated that at the time of the previous meeting with the EA, the full results from breach scenarios was awaited. Since that time however results from all breach locations has been provided and a full review has therefore been undertaken.

CT noted that the breach modelling provided by the EA, did not include the 1 in 100 year plus 39% climate change event (i.e. the design event) but did

include the 1 in 100 year plus 29% climate change event. This has therefore been used when assessing the residual impacts.

As a result of the reviews undertaken, CT indicated that breach location 36 to the north of the Site appears to have the greatest impact in terms of flood extent as illustrated within the Breach 36 Flood Extent Figure.

In line with the previous assessments, mapping illustrating the depth of flooding greater than 1.5m was shared by CT who indicated that to the east of the River Trent, the extent of flooding is lesser than the design event (meaning that mitigation already in place is sufficient). To the west however, the extent of flooding is greater.

CT indicated that a similar freeboard assessment has therefore been undertaken for the breach event that impacts the western areas and shared a figure illustrating this. CT noted that although the extent is greater, a freeboard would still be provided for large areas to the west, it is just that the freeboard is less than 300mm (as illustrated by the orange hatch within the breach freeboard and depth flooding figure).

CT noted however that in some localised areas, the base of the panels would be subject to flooding, even when raised to 1.8m (as illustrated by the pink to blue hatching in the freeboard and depth flooding figure). As with the design event, the flood depths above the base of the panels is anticipated to be within the range of 300mm-600mm.

CT noted that the given this is a residual event with a relatively low probability of occurrence, the design team and client were comfortable with the impact that any flooding in these areas could have on the development and the operational capacity.

SL again indicated that the approach taken to mitigation for the residual event is agreed by the EA and noted that it was clear that mitigation is being provided wherever feasible within the constraints of the Site.

Any Other Business

- 5.1 SL advised that in both the design and residual events, the impact that any floating debris could have on the panels is considered and that the framing be designed accordingly to accommodate any pressures as a result of this. CT and ES indicated that this would be considered and picked up as part of the design moving forwards.

PG queried any proposals for cable routes and how these are intended to cross the River Trent. EW provided an overview of the three current options and indicated that these are to be reviewed in greater detail as the design is progressed. It was noted however that an initial meeting had been held with Canal and Rivers Trust to discuss these options.

GP noted that there had recently been flooding (January 2024) at and in the vicinity of the Site and was wondering if the EA had any data indicating what return period they estimate this flooding equates to. The EA indicated they would look in to this and provide us a response.

EA

CT and GP informed the EA that the client commissioned a drone survey following the flooding so that the extents were understood. GP indicated that this can be provided to the EA for their records.

Logika

One Earth Solar

Third Flood Risk Meeting with Environment Agency

Date:	26 th September 2024	
Time:	14:30	
Location:	Virtual Teams Meeting	
Attendees:	██████████ - Environment Agency	██████████) – DWD Planning
	██████████) – Environment Agency	██████████ - AECOM
	██████████ – Environment Agency	██████████ - Logika
	██████████ - Environment Agency	██████████ - Logika
	██████████ – Icen	██████████ - Logika
	██████████ – Pershing Consultants	

Ref Commentary

Action

1.0 Introductions

- 1.1 CT led introductions and indicated that the purpose of the meeting is predominantly to run through the flood risk/water comments that the Environment Agency (EA) provided in response to the Preliminary Environmental Impact Report (PEIR). CT indicated that the focus of the meeting is likely to be on the approach to freeboard allowances, hydraulic modelling requirements, and considerations of water quality.

2.0 Site and Masterplan Overview (SG)

- 2.1 SG provided an overview of the site and the indicative masterplan as it stands. In particular, SG highlighted where the proposed substations and BESS will be located.

3.0 Approach to Freeboards

- 3.1 CT indicated that in previous meetings with the EA, the approach to freeboard allowances was discussed and agreed. However for the purposes of attendees that were not in previous meetings, CT noted that it would be sensible to run through the approach.
- 3.2 CT shared a figure illustrating the flood extents and depths in the 1 in 100 year plus 39% climate change event (i.e. the design flood event) and

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indicated that it is this event that we are primarily looking to mitigate against when considering freeboards.

- 3.3 CT indicated that based on site constraints (including visual, engineering and archaeological), the maximum height the solar panels can be raised to is 1.8m (between the ground level and base of the panels).
- 3.4 With this in mind, CT shared a figure illustrating depths greater than 1.5m in the design flood event scenario (1 in 100 plus 39%) along with the illustrative solar layout and indicated that the aim is to steer development away from depths greater than 1.5m, meaning that a minimum freeboard of 300mm will be provided across the majority of the Site.
- 3.5 CT indicated that there are areas where this was not quite achievable and shared a figure (summary of freeboard allowances) to help understand where the 300mm freeboard was or was not achieved.
- 3.6 Referring to the figure, CT indicated that certain areas within the site will achieve more than 300mm freeboard, whilst smaller areas will still be above the flood level but will have a freeboard less than 300mm. It was noted that very limited areas would experience flooding at the base of the panels during the design flood event.
- 3.7 CT indicated that the freeboard approach remains acceptable from a design perspective and indicated that due to the slender nature of the frames, it is not considered that there would be a risk of obstruction and flows would still continue around the panels and frames should a blockage occur.
- 3.8 SH indicated that if a 300mm freeboard was previously agreed upon, then this can be taken forward. In the context of the PEIR responses, SH mentioned that the EA would require more detailed information on the areas at risk of flooding, their location, the freeboard provided, and the measures put in place to protect the solar panels. Additionally, SH emphasized the need to ensure that flood routes are not altered and that, if debris accumulates, a maintenance plan for its removal is established.

4.0 Land Raising

- 4.1 CT noted that there were comments in the PEIR regarding land raising and confirmed that there is no intention to raise ground levels across the site. CT also mentioned that the panels are already being raised, and a sequential approach has been taken for the placement of the proposed substations and BESS, generally in areas not prone to flooding. CT noted however, that there are some local areas where inverters will be required within the design flood extents but clarified that these will be raised above the flood levels with voided structures beneath, ensuring no loss of floodplain storage or impacts on flows.

- 4.2 SH indicated that the above was agreeable but recommended that the risk of debris or sediment accumulating around any stilts/raised foundations. Therefore, a strict maintenance plan should be implemented to prevent this. CT confirmed that would be the case and it will be addressed in the FRA, providing an indicative maintenance plan for the planning stage to establish the key principals of what will be expected. Logika

5.0 Modelling Queries

5.1 Potential Increase in Flood Risk

- 5.1.1 CT made reference to the EA's PEIR comments where the recommended relating to the use of roughness patches or flow constriction within modelling to consider the impact that the panel frames could have on flood flows. CT noted that the frames and any stilts/foundations (for inverters) will be slender and spaced out accordingly to ensure that any impacts on flows would be limited and therefore asked for clarity on the EA's requests.
- 5.1.2 PS indicated that the tidal Trent model is relatively coarse in its grid size and noted that it was unlikely that any modelling exercise would show negative impacts. With this in mind, PS suggested that another quantified method could be used to illustrate to the EA that the proposed panel frames would not have an impact on flood risk to the Site or surrounding area.
- 5.1.3 CT suggested that one method that could be reviewed was the quantification of the frame volumes within the design flood event and determine a potential increased flood depth as a result. PS confirmed that the method was reasonable and it agreed that a depth of less than 5mm would be acceptable as this is within the generally agreed modelling tolerances. Logika

5.2 Pluvial vs Fluvial Considerations

- 5.2.1 CT made reference to the PEIR response and the EA's suggestion that additional modelling may be required to confirm flood risk from ordinary watercourses at the Site, where these may be the dominant source of flood risk.
- 5.2.2 CT clarified with the EA that the watercourses in question were the Fledborough Beck to the west, an unnamed ordinary watercourse to the south west and a final ordinary watercourse to the east. With this in mind, CT indicated that the watercourse to the east was entirely within the design flood extents from the River Trent and is the risk in this location is therefore associated with the River Trent. The EA were in agreement with both the watercourses in question and the dominance of the River Trent for the eastern areas.

- 5.2.3 CT referred back to the PEIR and noted that the original suggestion to use the medium risk surface water flood extents as a proxy for fluvial flood risk is unlikely to be a conservative estimate when also considering climate change. CT suggested therefore that the low risk flood extents and depths be used instead as this is a more conservative approach.
- 5.2.4 PS and SH agreed that this is a more conservative assessment but requested that some quantification is undertaken to confirm that the low risk pluvial event (between 1 in 100 year and 1 in 1,000 year probability of occurrence) is comparable to the design fluvial event.
- 5.2.5 CT and SM queried if there was a specific method that the EA would suggest following for this assessment. PS clarified that an assessment of flows within the catchments for the watercourses to the west would be sensible. Logika
- 5.2.6 Assuming that the results of the flow assessment indicate that the low risk pluvial extents are CT indicated that the panels would be raised above the pluvial flood depths, providing a 300mm freeboard wherever possible.
- 5.3 Breach**
- 5.3.1 CT indicated that within previous meetings with the EA, it was set out and agreed that based on the breach modelling results from the Tidal Trent modelling, a breach at location 36 (north of the Site) was shown to result in the maximum flood extent at the Site.
- 5.3.2 With the above in mind, CT queried with the EA, what additional assessments they would like to see to provide confidence of impacts in a breach scenario.
- 5.3.3 PS and SH indicated that they would like to see consideration of how breaches in locations closer to the Site could impact the development and the BESS/sub-station areas in particular.
- 5.3.4 CT/SM queried whether there was any specific technique that the EA would like to see in order to assess this. PS clarified, this this did not need to include formal hydraulic modelling but could be an assessment using in channel nodes from the Tidal Trent model at locations closer to the Site.
- 5.3.5 CT/SM indicated that they would take this away and consider the best ways to represent this and will then present to the EA at a later date for consideration. Logika

6.0 Water Quality Considerations

- 6.1 CT noted that reference to water quality of the existing watercourses on site were made in the EA's PEIR responses. CT clarified that there will only

be limited works to the watercourses and there would be no deterioration in status or any obstruction to them achieving good status in the future.

- 6.2 With the above in mind, CT queried whether there is a strict requirement for a full WFD assessment.
- 6.3 PG indicated that they would direct any specific questions on that matter to the water quality team, as there isn't anyone on the call who could provide insight. EA
- 6.4 CT indicated that they would include their questions and thoughts following the meeting. Logika

7.0 Any Other Business

- 7.1 CT indicated that the proposed development lies outside of flood zone 3b which is considered to be the functional floodplain by the EA and that the quality of the existing flood defences based on the inspection data is fairly in a good status.
- 7.2 CT also indicated that the maximum credible flood event has been assessed and provides similar results to the design flood event. CT noted that this will be summarised within the FRA.

Post Meeting Note

Following the meeting, a teams call was held between CT and PG on the 15.11.2024 to discuss the approach to modelling techniques and the outcomes of these. These discussions are summarised below:

Potential Increase in Flood Risk

- CT indicated that a high level assessment of the potential flood volume lost as a result of the solar panel frames has been undertaken and confirmed that a potential increase in flood depth of 0.09mm has been calculated which is well beneath the 5mm limit that the EA indicated previously.
- With regards to the above, CT clarified the following:
 - There are a total of approximately 1.5 million panels proposed within the Site boundary and to be conservative, it has been assumed that all panels would sit within the floodplain. In reality however, many of the panels do not lay within the floodplain and would not contribute to floodplain losses.

- The assessment of flood storage lost considers a conservative maximum flood depth of 1.8m across all panels. It is worth noting however, that flood depths across many of the panels will be well below 1.8m.
- Using the above, the maximum flood volume that could be lost as a result of the solar panel frames is equivalent to 618m³.
- The potential increase in flood depth is calculated by comparing the flood volume above (618m³) to the maximum extent of flooding in the design flood event (of 688 hectares).
- PG indicated that the approach was agreeable (subject to sight of calculations within the FRA) but suggested that the flood flow directions should also be interrogated within the model to add weight to the assessment.

Pluvial vs Fluvial Considerations

- CT indicated that a ReFH2 assessment using FEH catchment descriptors has been undertaken for the Fledborough Beck and Orsinary Watercourse to the south west. CT noted that the assessment considered the 1 in 100 year plus 39% climate change total flow to represent the fluvial flood scenario and the 1 in 1,000 year direct runoff to represent the pluvial flood scenario.
- CT noted that the results of the assessment indicated that the direct runoff in the pluvial scenario are greater than the fluvial. With this in mind, CT concluded that using the low risk flood extents and depths as a proxy for the design fluvial flood event was appropriate and conservative.
- PG indicated that this approach was acceptable.

Breach

- CT indicated that the in channel defended flood levels for the design flood event have been reviewed as a proxy for the potential breach flood level and the maximum in the vicinity of the Site is shown to be 8.7m AOD.
- CT noted that a contour at 8.7m AOD has therefore been added to the development plans which indicates that only a small part of the western BESS/substation area could be impacted by this residual flood level. CT indicated that on the basis that this is a residual event that this was considered acceptable from an operational perspective.

- CT noted that a breach flood level of 8.7m AOD would not reach the eastern BESS/substation areas due to high ground between the two areas.
- PG indicated that above assessment was considered to be appropriate and acceptable.



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