Green Hill Solar Farm
EN010170

Environmental Statement
Appendix 10.9: Flood Risk Assessment and Drainage Strategy Annex H: Green Hill F

Prepared by: Arthian

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APFP Regulation 5(2)(e)

Appendix 10.9: Annex H - Flood Risk Assessment and Drainage Strategy – Green Hill F

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For: Green Hill Solar Farm Ltd

Site: Green Hill F

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1. Site Details

The aim of this section of the report is to outline key environmental information associated with the baseline environment.

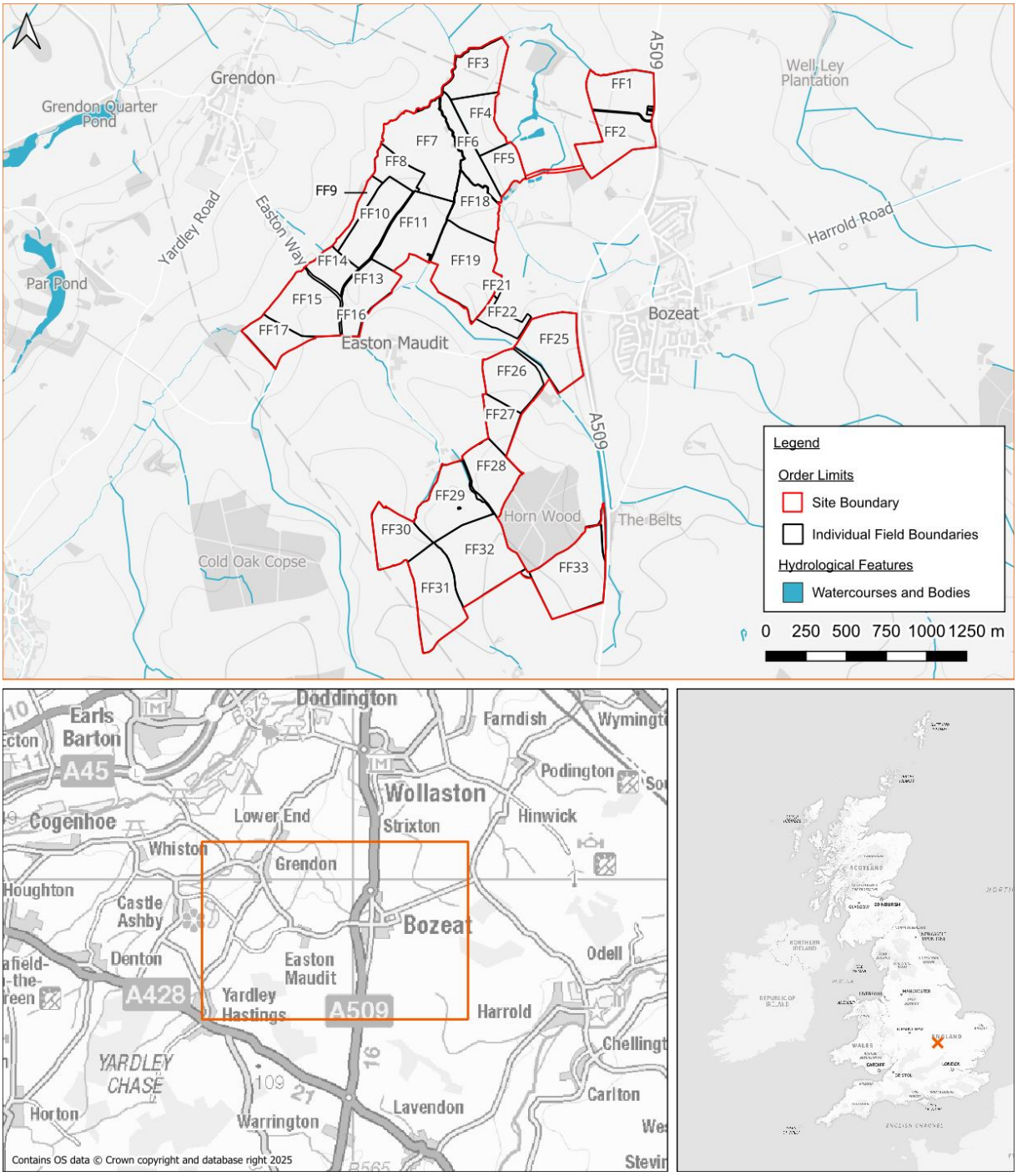

Figure 1: Site Location Plan

1.1 Site Location

1.1.1 Green Hill F is located between the Villages of Grendon and Bozeat approximately 10km south-east of

Northampton. The National Grid Reference for Green Hill F is approximately 489420, 260660 in the north (FF3) to 489990, 257140 in the south (FF33), and 487930, 258880 in the west (FF17) to 490000, 258900 in the east (FF12). The far northeast field is at approximately 490480, 260470 (FF1).

1.2 Existing Site Conditions

1.2.1 Online mapping (including Google Maps / Google Streetview imagery accessed August 2024)[i] shows that the Site is greenfield comprising agricultural / arable fields.

1.3 Topography

1.3.1 Topographic levels to metres Above Ordnance Datum (m AOD) have been derived from a 1m resolution Environment Agency (EA) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). A review of LiDAR ground elevation data shows that the Site slopes from approximately 100m AOD in the south to approximately 55m AOD in the north (Figure 2).

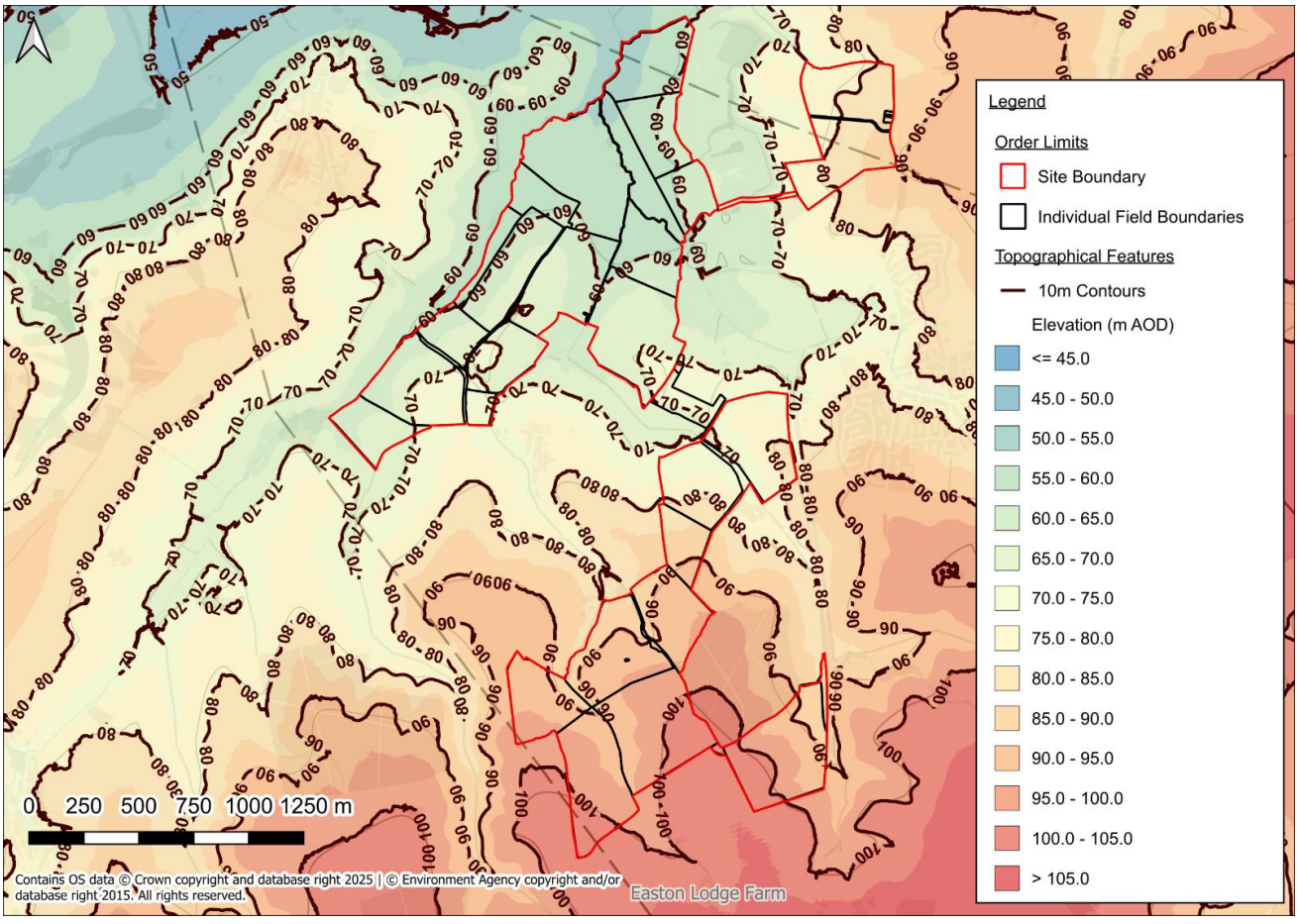

Figure 2: LiDAR Plan

1.4 Hydrology

1.4.1 The nearest watercourse is Grendon Brook (a Main River) which runs along the northern and north-western boundary of the Site in a north-easterly direction from Fields FF17 to FF3. A tributary of the Grendon Brook (a Main River) also is situated at the Site, which splits into two sections, the first flowing

in a northerly direction from Field FF18, along the west of Field FF6 where it converges with Grendon Brook to the north of Field FF6. The tributary of Grendon Brook also splits at the west of Field FF6, to the north of Field FF18, and this tributary runs in a north-easterly direction from the east of Field FF16, the south of Fields FF13 and FF12, before running between Fields FF19 and FF11 and FF18 and FF7.

1.4.2 Main Rivers are within the jurisdiction of the EA.

1.5 Water Framework Directive Status

1.5.1 The Site is located within the Grendon Brook Water Body Catchmentii. A summary of the Water Body Classification for the catchment is included as Annex A.

1.6 Geology

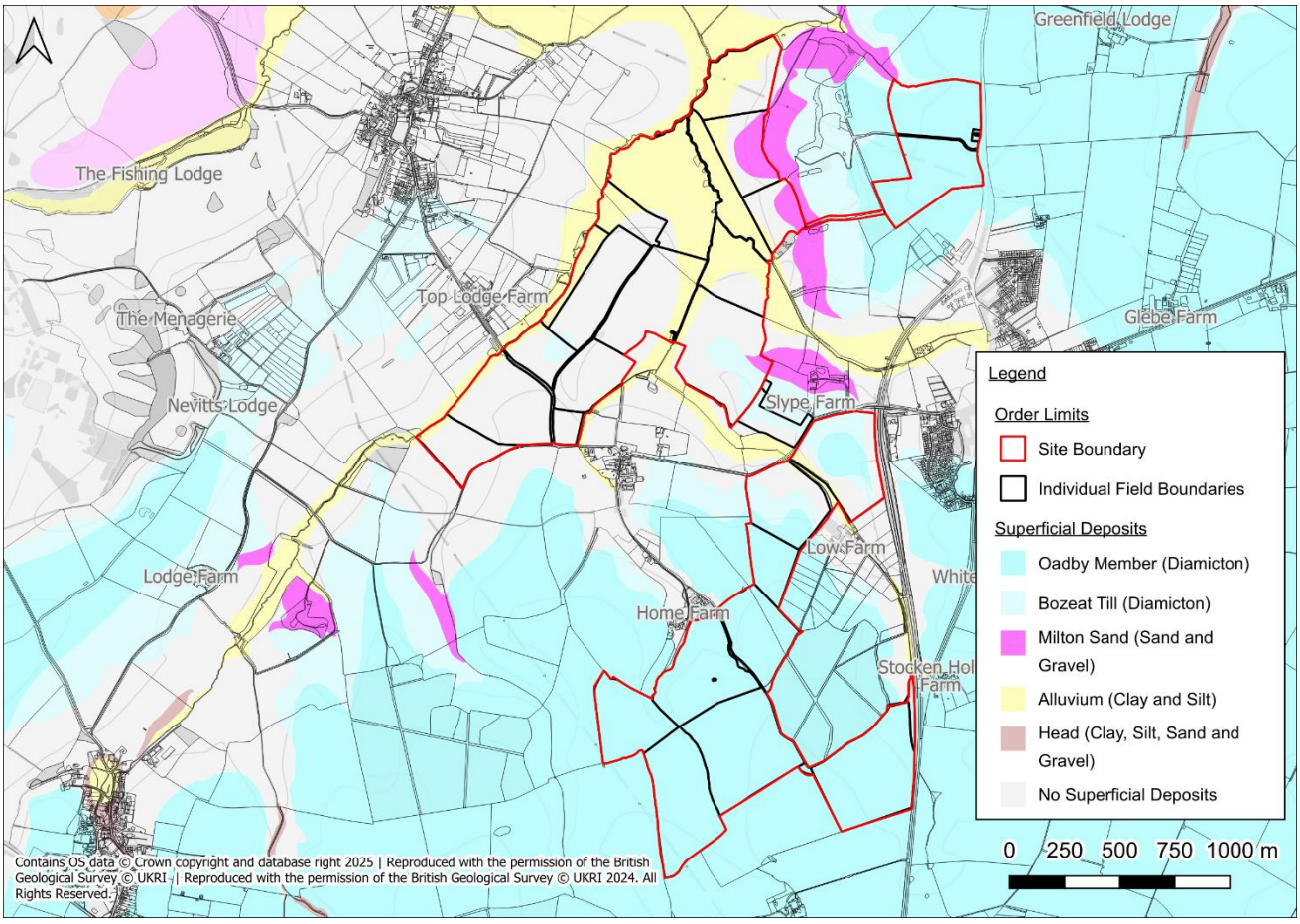

Figure 3: Superficial Deposits

1.6.1 Reference to the British Geological Survey (BGS) online mapping[iii] (1:50,000 scale) indicates that the Site is underlain by the following superficial deposits (see Figure 3 for the locations of the varying deposits):

- Oadby Member (Diamicton);
- Bozeat Till (Diamicton);
- Milton Sand (Sand and Gravel); and

- Alluvium (Clay and Silt).

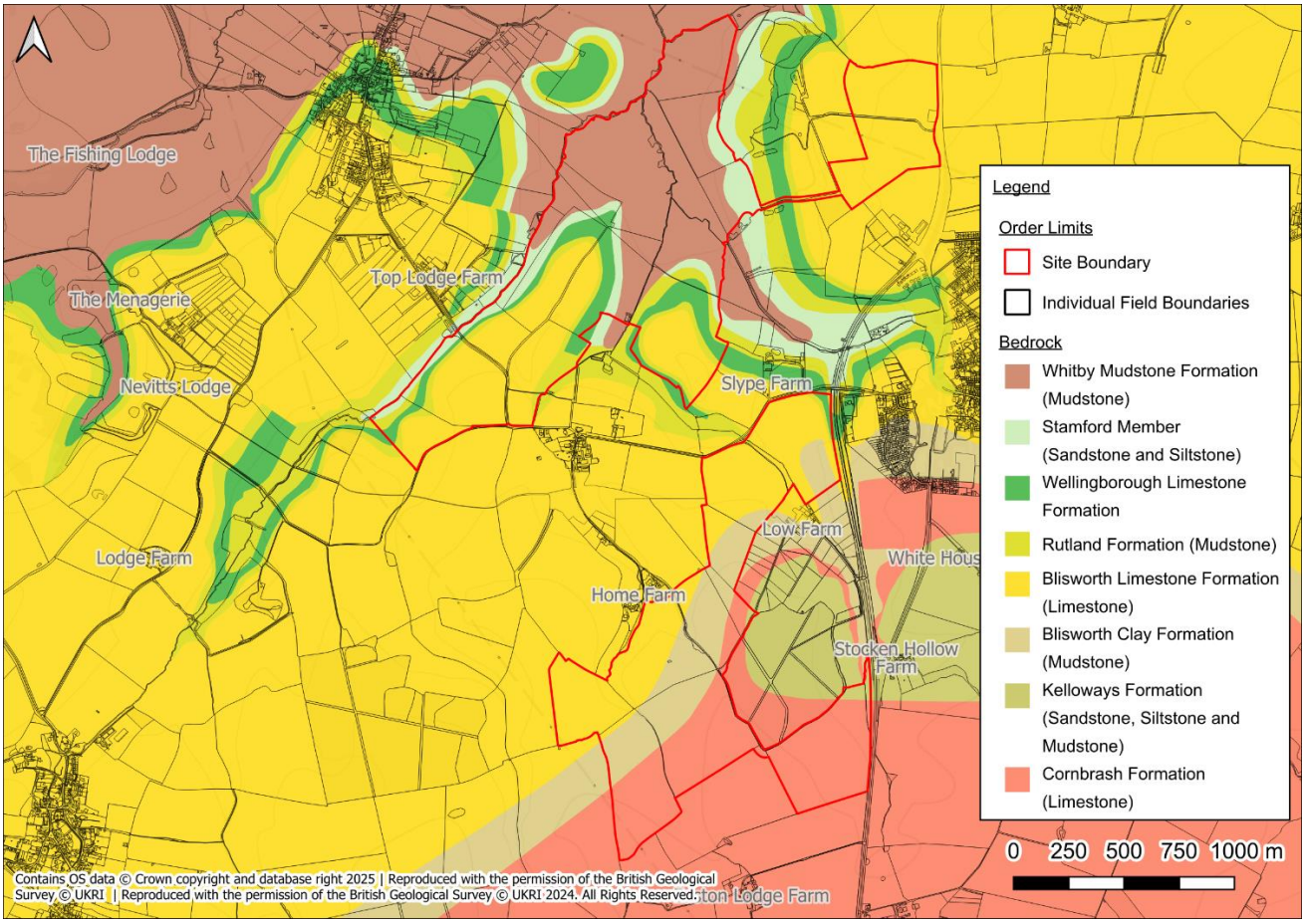

Figure 4: Bedrock Deposits

1.6.2 The Site is identified as being underlain by the following bedrock deposits (see Figure 4 for the locations of the varying deposits):

- Whitby Mudstone Formation (Mudstone);
- Tamford Member (Interbedded Sandstone and Siltstone);
- Wellingborough Limestone Member (Interbedded Limestone and Mudstone);
- Rutland Formation (Mudstone);
- Blisworth Limestone Formation (Limestone);
- Blisworth Clay Formation (Mudstone);
- Kelloways Formation (Sandstone, Siltstone and Mudstone); and
- Cornbrash Formation (Limestone).

1.6.3 The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a Site-specific basis.

1.6.4 BGS borehole (Ref: SP96SW50) is located to the north of Field FF1 and identifies soil to depths of 0.5m bgl, Boulder Clay to depths of 10.4m bgl and Blisworth Limestone to depths of 10.5m bgl. Due to the size

of the Site the BGS borehole is unlikely to be representative for other Fields across the Site. Further Site investigation may be undertaken to support the ES grounds conditions chapter.

1.7 Hydrogeology

1.7.1 According to the EA's Aquifer Designation data, obtained from MAGIC Map's online mapping[iv] [accessed 12/08/24], the Oadby Member is classified as a Secondary Undifferentiated Aquifer, whereas the Milton Sand and the Alluvium are described as Secondary A Aquifers. The Bozeat Till is detailed to be an Unproductive Aquifer.

1.7.2 The underlying Whitby Mudstone Formation and the Blisworth Clay formation are detailed to be Unproductive Aquifers. The Tamford Member, the Wellingborough Limestone Member and the Kelloways Formation are detailed to be Secondary A Aquifers. The Rutland Formation and Cornbrash Formation are classified as Secondary B Aquifers. The Blissford Limestone Formation is detailed as a Principal Aquifer.

1.7.3 The EA's 'Source Protection Zones' data, obtained from MAGIC Map's online mapping [accessed 12/08/24], indicates that the Site is not located within a Groundwater Source Protection Zone.

1.8 Proposed Site Conditions

1.8.1 Green Hill F proposes a ground mounted solar photo-voltaic plant and associated electrical infrastructure and access.

1.8.2 Green Hill F proposes a ground-mounted solar photovoltaic plant, associated electrical infrastructure, and access. Final development plans confirm that most of the Site will be used for solar panels, supporting infrastructure, and internal access. Peripheral areas are proposed to accommodate landscaped buffers, consistent with the embedded mitigation outlined throughout the ES and detailed further in the Outline Landscape and Ecological Management Plan (OLEMP) [EN010170/APP/GH7.4].

1.8.3 The Site also includes provision for a 132kV substation, located to the north-west of Field FF25.

2. Assessment of Flood Risk

The aim of this section of the report is to assess and summarise the existing flood risk at Green Hill F.

2.1 Fluvial Flood Risk

2.1.1 The nearest watercourse is Grendon Brook which runs along the northern and north-western boundary of Green Hill F in a north-easterly direction from Fields FF17 to FF3. A tributary of the Grendon Brook is also situated at Green Hill F, which splits into two sections, the first flowing in a northerly direction from Field FF18, along the west of Field FF6 where it converges with Grendon Brook to the north of Field FF6. The tributary of Grendon Brook also splits at the west of Field FF6, to the north of Field FF18, and this tributary runs in a north-easterly direction from the east of Field FF16, the south of Fields FF13 and FF12, before running between Fields FF19 and FF11 and FF18 and FF7. Grendon Brook is a main river and therefore is the responsibility of the EA to maintain, whereas ordinary watercourses are the responsibility of the LLFA to maintain.

2.1.2 Fluvial flooding could occur if Grendon Brook or the associated tributaries overtopped their banks during or following an extreme rainfall event.

2.1.3 According to the EA's Flood Map for Planning[v] (updated March 2025), Green Hill F is largely within Flood Zone 1 (has less than a 1 in 1,000 annual probability of river or sea flooding). Flood Zones 2 and 3 extents encroach 17 of the Fields, which are listed below and can be seen within Figure 5.

2.1.4 The flood extents are associated with Grendon Brook, as detailed further above and in section 1.0, Hydrology.

Table 1: Fields Impacted by Fluvial Flood Risk

Field	Area impacted
FF3	Western extents
FF4	North-western boundary
FF6	Northern, centre, southern extents
FF7	Northern, western, eastern extents
FF8	Northern extents
FF9	All of Field aside south-eastern boundary
FF10	Clips north-western boundary
FF11	Eastern extents
FF12	Eastern, southern extents
FF13	South-eastern and south-western extents
FF14	Northern boundary
FF15	Northern boundary
FF16	Eastern boundary
FF17	Northern, western and southern extents

FF18	Northern, north-eastern and north-western extents
FF19	Clips northern and western boundary
FF20	North-western boundary
FF25	Western extents
FF29	Clips southwest
FF30	Clips east
FF31	Clips east
FF32	Western boundary extents

2.1.5 Flood Zone 2 and 3 extents are expected to impact the proposed solar development in Fields FF3, and FF32. A flood compensation analysis is detailed below. The flood extents also clip the proposed development in Fields F11 and FF18; however, the affected areas are limited to small peripheral sections of these fields and lie predominantly where no infrastructure is proposed. The potential for floodwaters to interact with the solar panels or their supports is minimal, as the development in these areas is either located outside of the floodplain or raised sufficiently to avoid contact with flood flows. As a result, any associated displacement of floodplain storage is considered negligible, and the implementation of specific flood compensation measures in these locations is not considered necessary or proportionate.

2.1.6 The Environment Agency has advised that, for any development located within Flood Zone 3a (i.e. the 1 in 100-year plus climate change flood extent), floodplain storage compensation should be incorporated into the design. Compensation should be provided on a level-for-level and volume-for-volume basis, ensuring direct replacement of any lost storage.

2.1.7 Flood volume loss has been conservatively estimated based on the cross-sectional area of the proposed panel supports (28.65cm^2), multiplied by the number of supports located within Flood Zones 2 and 3 across the Site (assumed as 10 piles per 100 m of panels, equating to approximately 2,200 piles), and applying a worst-case flood depth of 1.2m. This results in a total displaced volume of just 8m^3 across the entire submission area.

2.1.8 To assess the potential uplift in flood levels resulting from the loss of floodplain storage in Field FF3, the downstream extent of the floodplain has been defined at the location of the main road crossing. This point was selected as a practical hydrological boundary, as the road is likely to act as a flow restriction during flood events, limiting downstream floodplain connectivity. Any potential impact from the minor loss of flood storage would therefore be most likely to affect areas upstream of the road, making it an appropriate and conservative boundary for this assessment. This catchment has been calculated as approximately 318,482.07m^2. When the conservatively estimated displaced volume of 8m^3, representing the total potential flood storage displacement across the entire DCO application area, is spread across the full floodplain extent, the theoretical increase in flood depth is approximately 0.000025mm.

2.1.9 To assess the potential uplift in flood levels resulting from the loss of floodplain storage in Field FF32, the location of the downstream limited was selected as Home Farm given the morphology of the flood risk extent. The floodplain area within the Green Hill Field FF32 catchment has been calculated as approximately 20,483.7m. When the conservatively estimated displaced volume of 8m^3, representing

the total potential flood storage displacement across the entire DCO application area, is spread across the full floodplain extent, the theoretical increase in flood depth is approximately 0.39mm.

2.1.10 Both flood depths are considered negligible, well within the natural variability of floodplain behaviour, and would result in no perceptible change in flood levels or flow routes. It therefore represents a highly conservative assessment of worst-case impacts.

2.1.11 Given the extremely limited displacement, the conservative assumptions applied, and the imperceptible increase in flood depth, the impact on flood storage capacity is considered de minimis. On this basis, it is concluded that further consideration or provision of compensatory flood storage resulting from panelled areas encroaching into the flood extents is not necessary or proportionate for the proposed development.

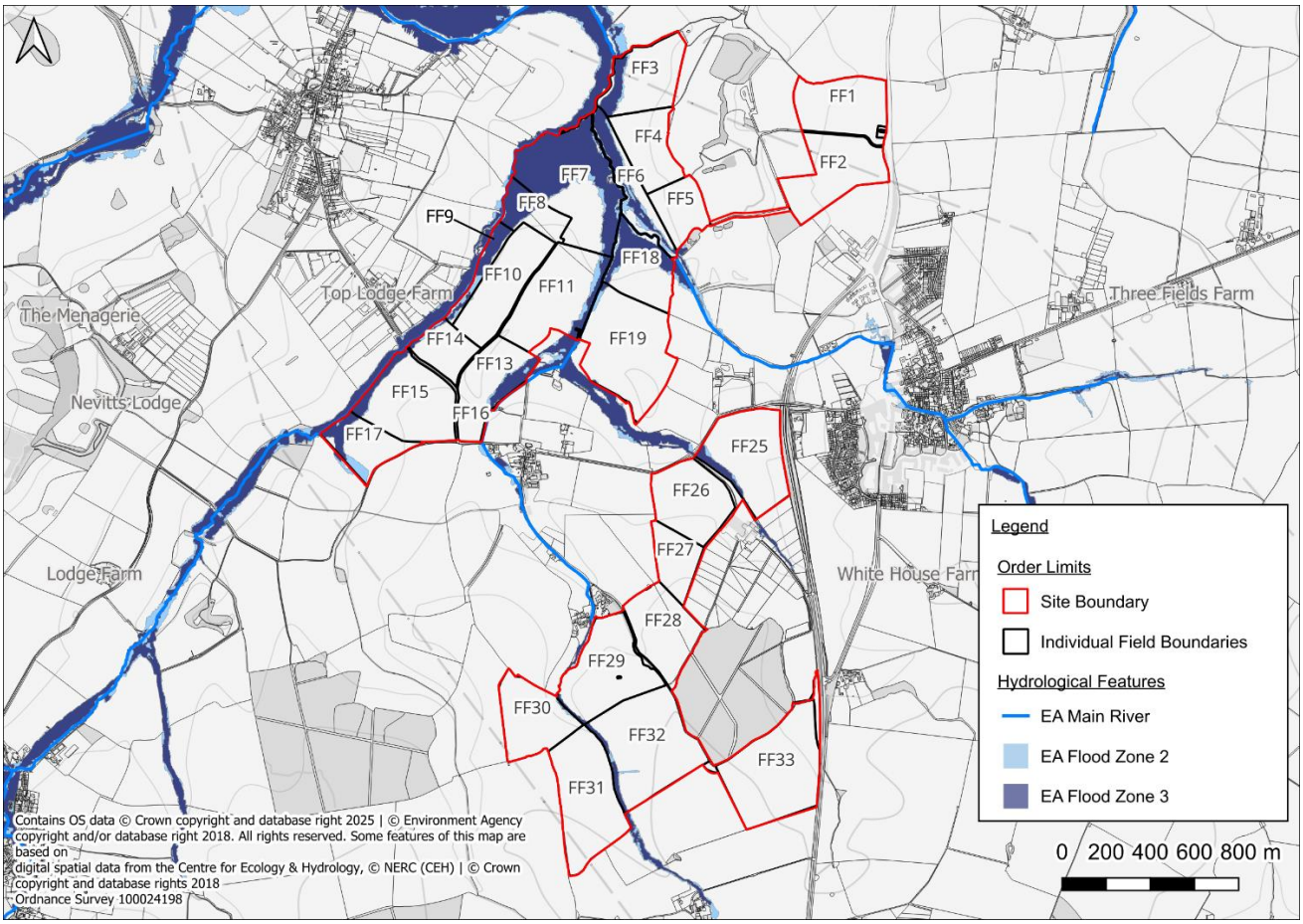

Figure 5: EA's Flood Map for Planning

2.1.12 The EA 'Recorded Flood Outlines' Map (Figure 6) shows that flooding occurred in the northwest part of Green Hill F, affecting Fields FF3, FF6, FF7, and FF8, in March 1947. Since this event took place over 75 years ago, it may not account for recent improvements in flood defences and drainage systems that may mitigate against this flood event from re-occurring.

2.1.13 According to the EA's 'Spatial Flood Defences with Standardised Attributes' dataset, the section of Grendon Brook from Fields FF3-5, is identified to have natural high ground defences. Defended and undefended flood extents are not available, however the natural high ground defence is clearly defined

by the EA's LiDAR data and will have formed the basis for the EA's Online Flood Map for Planning. Figure 5 therefore represents the actual present day scenario including the natural high ground.

2.1.14 There is no Site-specific information within third party reports relating to fluvial flood risk.

2.1.15 The EA have provided modelled flood extents which were conducted as part of the Grendon 2013 model, discussed below and seen in Figure 7. The modelled flood extents appear to mirror the EA Flood Zone extents seen in Figure 5, which the EA have stated are produced based on national scale generalised modelling and not from local scale detailed modelling. This EA correspondence highlighting this has been provided in Annex B.

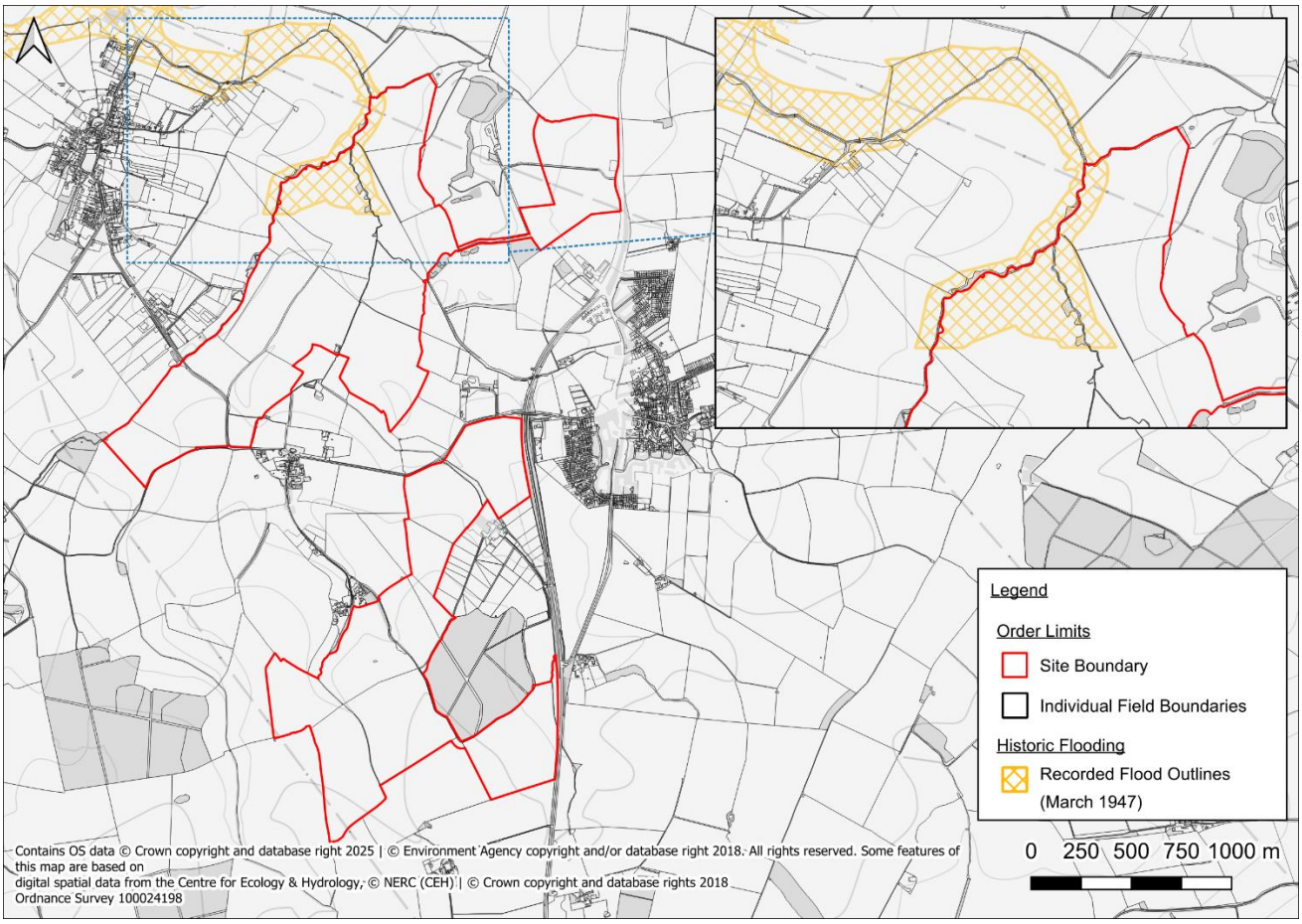

Figure 6: EA Historic Flood Map

2.1.16 The Manning's open channel flow formula has been used to demonstrate and quantify potential fluvial flood risk to the Site during a 1% AEP +36% CC fluvial event. Cross sections of existing watercourses and the wider floodplain have been extracted from EA LiDAR data (flown Q1 2020) and used to inform the calculations. More detail on these calculations is provided in Annex C. The flood levels estimated by the calculations suggest that the flood extent is low and that flood extents on Site would be similar to or smaller than the EA surface water flood extents, which could therefore be used as a conservative proxy for fluvial flood risk. Surface water flooding is assessed in Section 2.3 below.

2.1.17 The watercourses can be seen adjacent to the western boundary of the Site, adjacent to the east of Fields FF7, FF11, FF12, FF13 and FF16, and adjacent to the west of Fields FF6, FF18, FF19 and FF20.

2.1.18 However, the vast majority of the remaining Green Hill F Site is not expected to flood. The areas that experience flood depths are not expected to exceed depths of 0.3m.

Consultation

2.1.19 The EA were consulted in January 2024, a response was received in February 2024 and included modelling data for the Grendon Brook (2013). Flood extents for the defended 1 in 2 year scenario, 1 in 10 year scenario, 1 in 50 scenario and 1 in 100 year scenario are included as Figure 8. The mapping finds the following Fields are impacted by the 1 in 10 year scenario and greater:

Table 2: Fields Impacted by EA Modelled Flood Extents

Field	Area impacted
FF3	Western extents
FF4	North-western boundary
FF6	Northern, centre, southern extents
FF7	Northern, western, eastern extents
FF8	Northern extents
FF9	All of Field aside south-eastern boundary
FF11	Eastern extents
FF12	Eastern, southern extents
FF13	South-eastern and south-western extents
FF14	Northern boundary
FF15	Northern boundary
FF17	Northern extents
FF18	Northern, north-eastern and north-western extents
FF19	Clips western boundary
FF20	North-western boundary

2.1.20 However, the flood extents are largely shown to remain in the immediate extents of Grendon Brook. No flood depth modelling data was made available by the EA.

2.1.21 The North Northamptonshire LLFA was contacted in February 2024. A response was received in April 2024 and is included in Annex D. Green Hill F is not located within an IDB.

2.1.22 Further to this, the EA and LLFA were consulted with throughout the pre-application process, with guidance complied with where required.

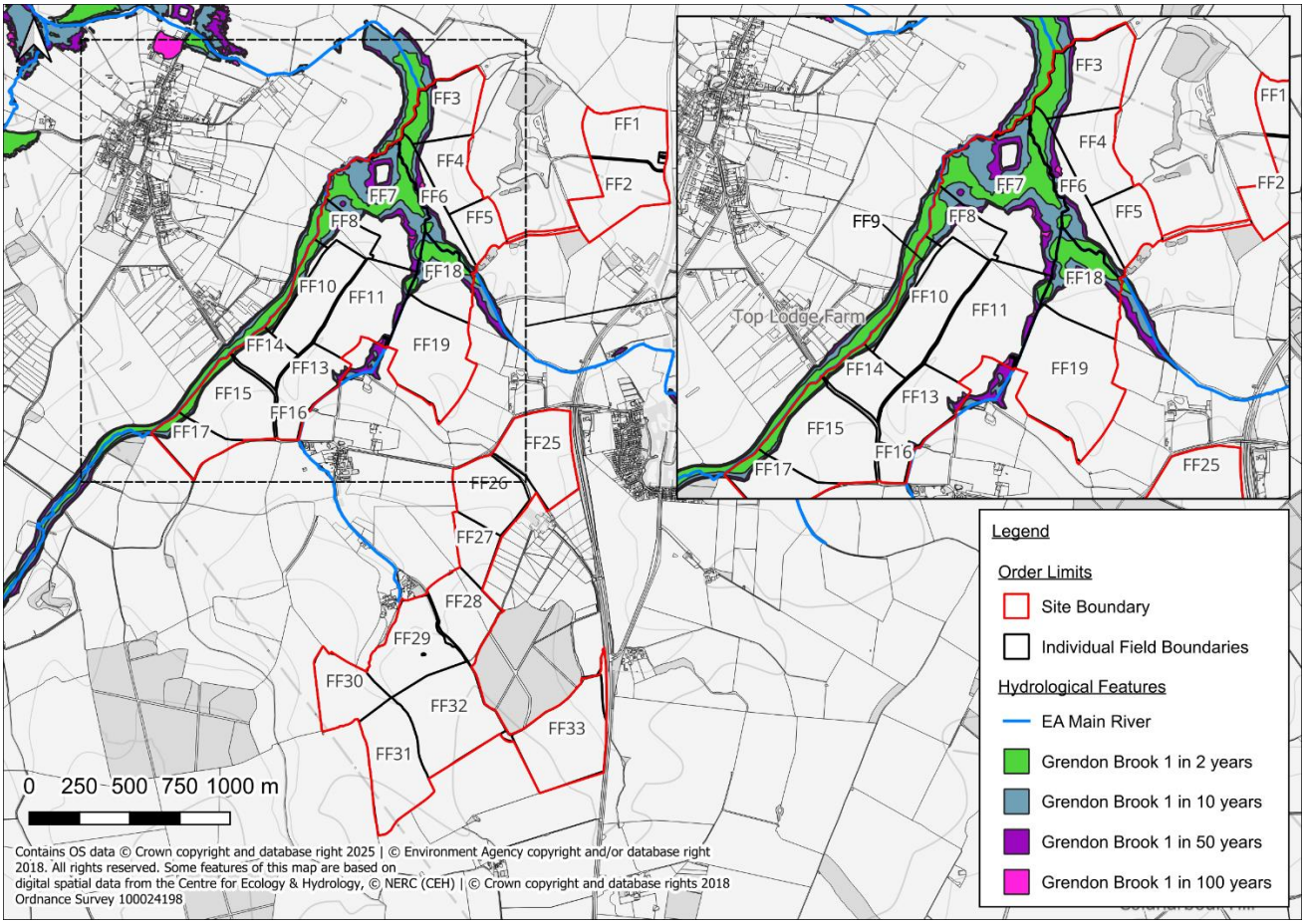

Figure 7: EA Grendon Brook Modelling Defended Flood Extents

Summary

2.1.23 The flood extents largely remain in the immediate extents of Grendon Brook. Additionally, 8m easements will be established around the watercourses (Section 3.2 of the Covering Report).

2.1.24 Therefore, Green Hill F is therefore considered to be at **Low** risk of fluvial flooding overall, the proposed solar panels will be raised above surrounding ground levels with associated electrical infrastructure appropriately located out of the flood zone and waterproofed.

2.2 Surface Water Flood Risk

2.2.1 The EA's National Flood Risk Assessment Mapping (NaFRA), known as the Long Term Flood Risk Map (Surface Water)[vi] was updated in January 2025.

2.2.2 The NaFRA mapping provides an updated view of surface water flooding across the Sites, however it should be noted that at the time of writing, the NaFRA mapping only delivers climate change insight up to the year 2060.

2.2.3 The previous EA Risk of Flooding from Surface Water (RoFSW) mapping indicates that Green Hill F is largely at a at Very Low risk of surface water flooding (<0.1% annual probability of flooding). The risk increases to Low (between a 1% and 0.1% annual probability), Medium (between a 3.3% and 1% annual

probability) and High risk (>3.3% annual probability) of flooding associated with the watercourses that run through the Green Hill F.

2.2.4 The updated NaFRA mapping (Figure 9) indicates that the surface water flooding extents at Green Hill F are reduced and therefore improved in comparison to the previous Long Term Flood Risk Mapping. The remaining surface water risk continues to be associated with the watercourses that run through Green Hill F, however the extents are much smaller and sparser. There are multiple flow routes that bisect the Green Hill F Site. All development will be outside of these extents.

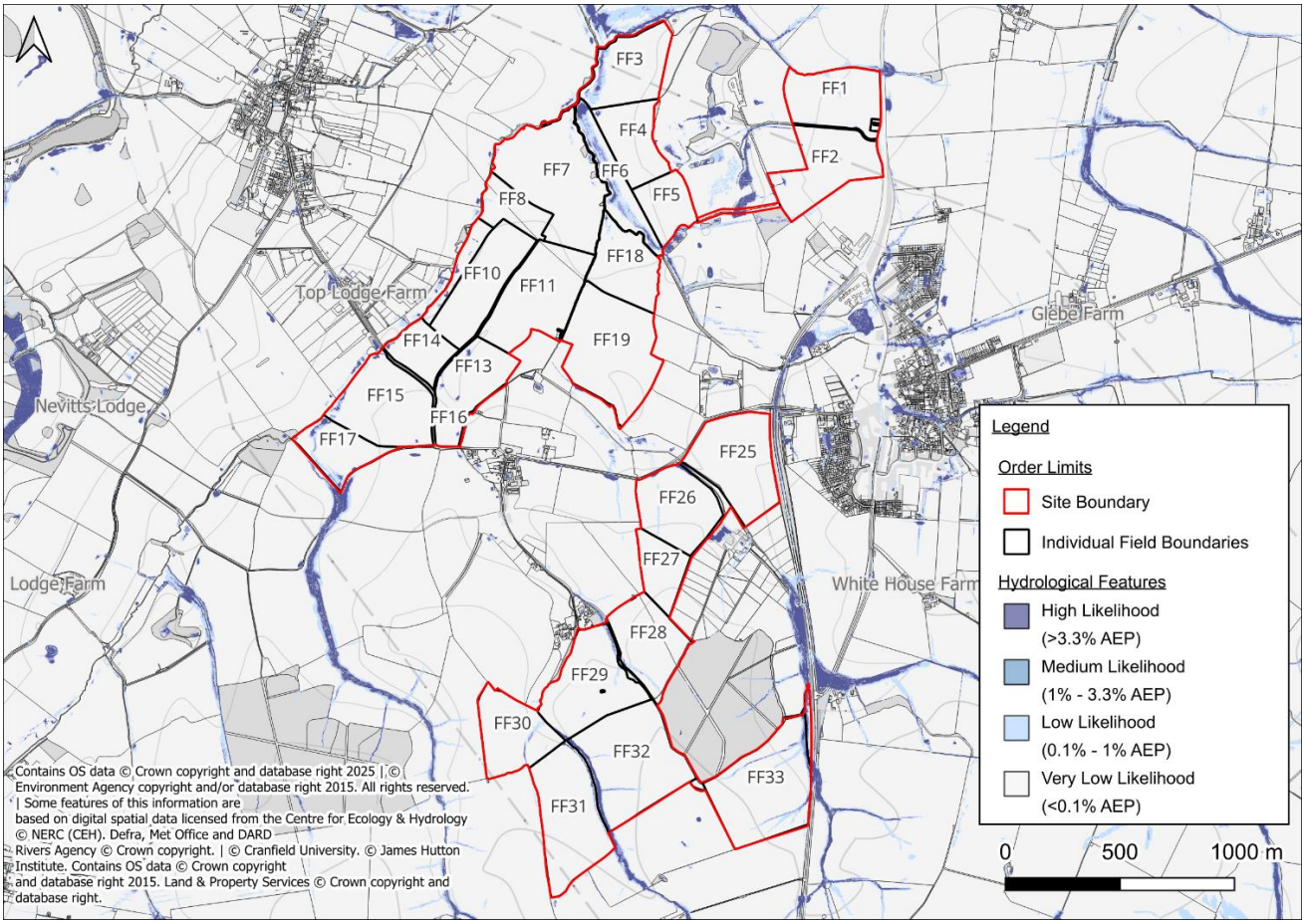

Figure 8: EA's Long-Term Flood Risk Map (Flood Risk from Surface Water)

2.2.5 NaFRA surface water mapping indicates that the majority of Green Hill F is subject to flood depths of below 0.3m. Surface water depths of less than 0.3m are typically passable by both vehicles and pedestrians.

2.2.6 There is no indication within relevant third party reports (listed in 'Sources of Information' on the Covering Report) to suggest that the Site has historically experienced surface water flooding.

2.2.7 Based on the above and considering the embedded mitigation as part of the design of the Site layout, the overall risk of surface water flooding is considered to be **Low**. The proposed solar panels will be raised sufficiently above the surrounding ground levels and appropriately located out of the flood zone and waterproofed so that they are not at risk of being impacted in the event of surface water flooding.

2.2.8 The Drainage Strategy set out in Section 5.0 of the Covering Report will ensure that surface water risk is not exacerbated through implementing appropriate SuDS measures.

2.3 Groundwater Flood Risk

2.3.1 A description of the Site's geology is included within section 1.0.

2.3.2 There is no information within relevant third-party reports (listed 'Sources of Information' on the Covering Report) to suggest that the Site has experienced historical groundwater flooding.

2.3.3 No buildings other than the supporting unstaffed infrastructure and no basement levels are identified on plans which may otherwise be at increased risk from groundwater seepage.

2.3.4 It can therefore be concluded that the risk of groundwater flooding is **Low** and no specific mitigation measures are required.

2.3.5 It can therefore be concluded that the risk of groundwater flooding is **Low.**

2.4 Sewer Flooding

2.4.1 No Site-specific incidents of sewer flooding have been identified from relevant third-party reports. On the basis of the Site's rural setting the presence of sewerage infrastructure is unlikely. Utility records have been checked and no sewers are identified within the Field boundaries. There is a water main located across Fields FF22, and FF27 - FF32, however these have been respected in the Scheme design. It can therefore be concluded that the risk of sewer flooding is **Low.**

2.5 Reservoir and Canal Flooding

2.5.1 There are no canals within the vicinity of Green Hill F, therefore there is negligible associated flood risk.

2.5.2 The EA 'Flood Risk from Reservoirs' map shows that Green Hill F is not at risk of flooding from reservoirs.

2.5.3 It can therefore be concluded that there is a **Negligible** risk of flooding from artificial sources.

2.6 Residual Flood Risks

2.6.1 A residual risk is an exceedance event, such as the greater than 1 in 1000 year (<0.1% AEP) flood event that would overtop the Grendon Brook and potentially impact the Site. As the probability of a 1 in 1000 year flood event occurring is <0.1% in any given year, the probability is low and, therefore, no further mitigation beyond what is proposed is required.

2.6.2 In the event of any defences failing or an exceedance event occurring, the residual risk to people working within the Site can be managed through the implementation of an appropriate Site management plan, which recognises the residual risks and details what action is to be taken by staff in the event of a flood to put occupants in a place of safety.

2.7 Summary of Flood Risk and Mitigation

2.7.1 It can be concluded that the risk to Green Hill F from all sources of flooding is **Negligible to Low**, however

it would be prudent to include the below mitigation measures.

2.8 Embedded Mitigation

2.8.1 Embedded Mitigation is detailed in section 3.2 of the covering report.

Flood Warnings and Evacuation

2.8.2 Flood Warnings / Flood Alerts[vii] do partly cover this Green Hill F, therefore Site management should sign up to the free EA Floodline service to receive flood alerts.

2.8.3 Access to the Site will be required relatively infrequently, typically by technicians for maintenance and inspection works or Site management. Such works can be scheduled as to avoid the Site during times of flooding.

2.9 Impact on Off-Site Flood Risk

2.9.1 The solar panels will be mounted on frames and raised above ground level allowing flood water to flow freely underneath. Therefore, there will be no loss of floodplain volume as a result of the Scheme and no increase in flood risk elsewhere.

2.9.2 The supporting infrastructure is insignificant in size and will not increase flood risk elsewhere.

2.9.3 Surface water management has been considered in Section 5.0 of the Covering Report.

3. Conclusions and Recommendations

3.1 Conclusions

3.1.1 The proposed development to be placed on Site F as part of the Scheme is ground mounted solar panels and associated infrastructure, a 132kV substation and access roads.

Flood Risk

3.1.2 The Site is predominately located within Flood Zone 1 on the Environment Agency (EA) 'Flood Map for Planning (Rivers and Sea)' – an area considered to have the lowest probability of fluvial and tidal flooding. However, the northern Fields of the Site are identified to be situated within Flood Zones 2 and 3, associated with Grendon Brook.

3.1.3 A floodplain storage compensation analysis found that within Fields FF3 and FF32, as Flood Zones 2 and 3 are detailed to impact the proposed solar developments, which found that the theoretical increase in flood depth is approximately 0.000025mm and 0.39mm respectively. Both flood depths are considered negligible, well within the natural variability of floodplain behaviour, and would result in no perceptible change in flood levels or flow routes. It therefore represents a highly conservative assessment of worst-case impacts

3.1.4 EA product data finds Fields FF3, FF4, FF6, FF7, FF8, FF9, FF11, FF12, FF13, FF14, FF15, FF17, FF18, FF19 and FF20 to be within the 1 in 10 year and greater flood extents. However, the flood extents are largely shown to remain in the immediate extents of Grendon Brook. Flood depth data was not included within the modelling data provided by the EA.

3.1.5 The risk of flooding from all sources has been assessed and the flood risk is considered to be **Negligible to Low** and therefore does not require Site-specific mitigation measures.

3.1.6 The solar panels will be mounted on raised frames and therefore raised above surrounding ground level allowing flood water to flow freely underneath. Therefore, there will be no loss of floodplain volume as a result of the Scheme.

3.2 Recommendations

3.2.1 Embedded Mitigation is detailed in section 3.2 of the covering report.

Annex A - Grendon Brook Water Body Catchment Classification Summary

Classification Item	2019 Classification		2019 Classification		Cycle 3 Objectives	
	Cycle 2	Cycle 3	Cycle 3	Status	Year	Reasons
Ecological	Moderate	Moderate	Moderate	Moderate	2022	
Biological Quality Elements	N/A	Moderate	Moderate	Moderate	2022	
Invertebrates	N/A	Good	Good	Good	2022	
Macrophytes and Phytobenthos Combined	N/A	Moderate	Moderate	Moderate	2022	Disproportionately expensive: Disproportionate burdens; Technically infeasible: No known technical solution is available
Physio-Chemical Quality Elements	Moderate	Moderate	Moderate	Moderate	2022	
Acid Neutralising Capacity	N/A	N/A	N/A	N/A	2022	
Ammonia (Phys-Chem)	High	N/A	High	Moderate	2022	
Dissolved Oxygen	High	High	High	High	2022	
Phosphate	Poor	Poor	Poor	Poor	2022	
Temperature	High	High	High	High	2022	
pH	High	High	High	High	2022	
Hydromorphological Supporting Elements	Supports Good	Supports Good	N/A	N/A	2022	
Supporting Elements (surface Water)	Moderate	N/A	N/A	N/A	2022	
Mitigation Measures Assessment	Moderate or less	N/A	N/A	N/A	2022	
Specific Pollutants	High	N/A	N/A	N/A	2022	
Iron	N/A	N/A	N/A	N/A	2022	
Maganese	N/A	N/A	N/A	N/A	2022	
Chemical	N/A	Fail	Fail	N/A	2022	Natural conditions: Chemical status recovery time; Technically infeasible: No known technical solution is available
Priority Hazardous Substances	N/A	Fail	Fail	N/A	2022	Natural conditions: Chemical status recovery time; Technically infeasible: No known technical solution is available
Benzo(a)pyrene	N/A	Good	Good	N/A	2022	
Dioxins and dioxin-like compounds	N/A	Good	Good	N/A	2022	
Heptachlor and cis-Heptachlor Epoxide	N/A	Good	Good	N/A	2022	
Hexachlorobenzene	N/A	Good	Good	N/A	2022	
Hexachlorobutadiene	N/A	Good	Good	N/A	2022	
Mercury and Its Compounds	N/A	Fail	Fail	N/A	2022	Natural conditions: Chemical status recovery time
Perfluorooctane sulphonate (PFOS)	N/A	Fail	Fail	N/A	2022	Technically infeasible: No known technical solution is available
Polybrominated diphenyl ethers (PBDE)	N/A	Fail	Fail	N/A	2022	Natural conditions: Chemical status recovery time
Priority substances	N/A	Good	Good	N/A	2022	
Cypermethrin (Priority)	N/A	Good	Good	N/A	2022	
Fluoranthene	N/A	Good	Good	N/A	2022	
Other Pollutants	N/A	N/A	N/A	N/A	2022	

Annex B – EA Correspondence

From: PSOWN <PSOWN@environment-agency.gov.uk>
Sent: 14 August 2024 14:04
To: [redacted]
Cc: Lincs & Northants, Customer Enquiries <LNenquiries@environment-agency.gov.uk>
Subject: RE: Green Hill Solar (313532) CCN/2024/371736 (prev ref CCN/2024/345098)

[redacted]

> You don't often get email from [redacted]

Dear Lucy,

The flood zones for your site have been produced based on national scale generalised modelling and not from local scale detailed modelling. We are therefore unable to provide detailed information such as flood levels. The national scale generalised modelling covers all watercourses with a catchment greater than 3km^2. It also includes dry valleys so the flood map may show a flood extent where there is no watercourse.

Please note, any map supplied of non-main river flood zones may include flood zones covering adjacent main rivers which may be different to the Flood Map for Planning flood zones. This is due to flood zones on main rivers being updated through local detailed modelling, whereas the non-main river national generalised model was a one off run in 2004.

This information will be updated in 2024 in line with the new national model.

Kind regards,

[redacted]

FCRM Officer, Partnerships and Strategic Overview (Welland & Nene) | Lincolnshire and Northamptonshire
Environment Agency | Nene House, Pytchley Lodge Road, Kettering, NN15 6JQ
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Annex C - Manning's Open Channel Flow Mapping

313532 Green Hill Solar Farm

Manning's Open Channel Flow Calculation - Option Area F

Methodology

Cross-sections of the channel and floodplain were extracted from Environment Agency (EA) LiDAR DTM data (flown Q1 2020) at the locations shown in Figure 1. These cross-sections can be considered representative of the channel and general floodplain adjacent to the site and at the location of the proposed development. Due to the nature of LiDAR, volume and conveyance of the main channels will likely be underestimated, providing a conservative assessment of fluvial flood risk.

The cross-sections were imported into Flood Modeller and the "tabulate cross section properties" tool was utilised to establish the level-flow relationship for the channel and wider floodplain. This tool utilises the Manning's open channel flow equation. Manning's 'n' roughness was set to 0.03s/m$^{1/3}$ for the channel and 0.04s/m$^{1/3}$ for the floodplain based on aerial imagery. The bed slope was set for each cross-section based on underlying LiDAR. Catchment descriptors for the catchments upstream of the outlet locations shown in Figure 1 were imported into ReFH2 and used to provide an estimate of flows within the channel during the 1% AEP +36%CC event. These flows were scaled by area as required.

Within this excel workbook, the xlookup function has been used along with the Flood Modeller level-flow relationship for the cross-sections to determine the equivalent water level for the calculated flow, rounding up where a direct match is not found. To provide additional confidence in the assessment, a second xlookup has been used to determine the estimated flood level should an additional 50% flow be applied.

Cross-sections have been located at suitable locations throughout the proposed development. Whilst it is acknowledged that the Manning's open channel flow equation used to determine the level-flow relationship does not constitute detailed hydraulic modelling, the calculation can still be considered suitable to demonstrate the scale of the changes in water level that can be expected when considering a +36% uplift in flows (Nene Catchment, 2080's higher allowance).

Cross-Section Locations

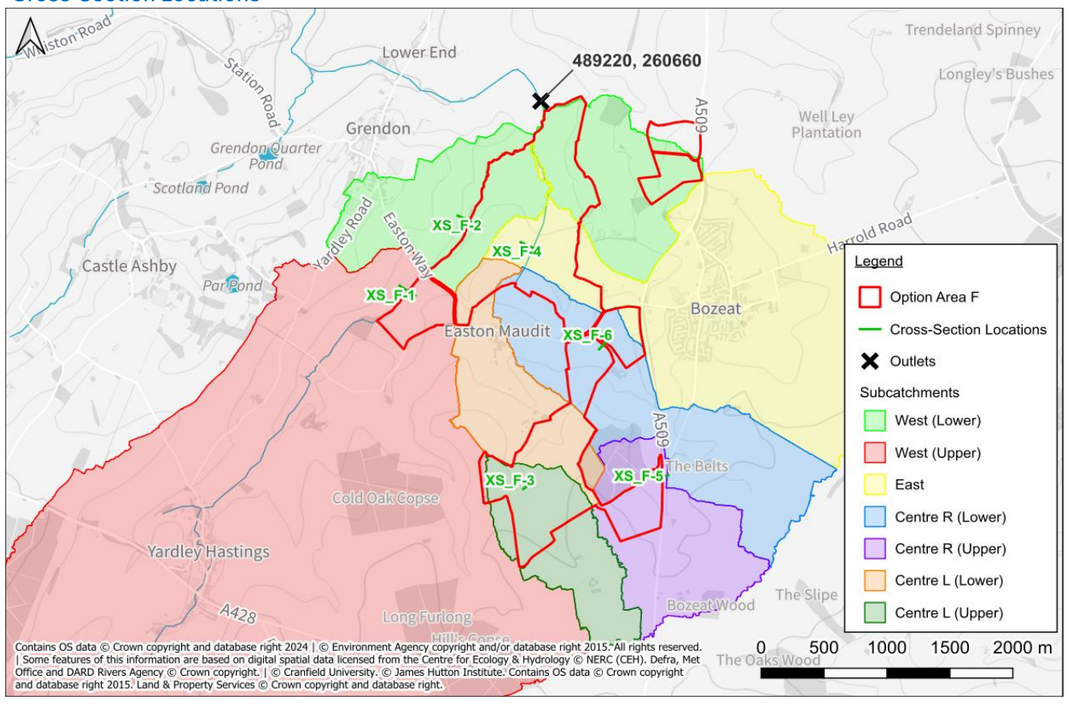

Figure 1: Cross-section locations

Calculated Flows and Levels

Cross-Section	ReFH2 Peak Flow - 1% AEP +36%CC (m^3/s)	Equivalent Flood Level (m AOD)	Sensitivity Flow - ReFH2 +50% (m^3/s)	Equivalent Flood Level (m AOD)
F-1	11.80	61.26	17.70	61.38 (+120mm)
F-2	11.80	58.26	17.70	58.33 (+67mm)
F-3	0.72	89.30	1.09	89.39 (+93mm)
F-4	1.51	59.52	2.27	59.68 (+167mm)
F-5	0.95	84.92	1.42	84.99 (+74mm)
F-6	2.46	70.43	3.69	70.46 (+36mm)

Tabulated Cross-Section Properties | F-1

(Calculated by Flood Modeller)

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
F-1	0.000	59.901	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0018
F-1	0.013	59.994	0.093	0.138	0.204	0.096	0.308	2.056	2.065	0.0018
F-1	0.030	60.028	0.127	0.169	0.215	0.178	0.707	2.813	2.824	0.0018
F-1	0.084	60.086	0.185	0.228	0.231	0.367	1.960	3.684	3.711	0.0018
F-1	0.253	60.184	0.283	0.338	0.254	0.749	5.933	4.128	4.196	0.0018
F-1	0.498	60.282	0.381	0.425	0.267	1.174	11.675	4.572	4.682	0.0018
F-1	0.817	60.379	0.478	0.497	0.277	1.643	19.136	5.016	5.167	0.0018
F-1	1.210	60.477	0.576	0.561	0.285	2.155	28.334	5.460	5.653	0.0018
F-1	1.678	60.575	0.674	0.619	0.292	2.711	39.309	5.904	6.138	0.0018
F-1	1.750	60.589	0.688	0.626	0.292	2.794	40.982	5.980	6.219	0.0018
F-1	2.181	60.673	0.772	0.656	0.296	3.327	51.084	6.651	6.912	0.0018
F-1	2.686	60.758	0.857	0.686	0.299	3.916	62.900	7.323	7.604	0.0018
F-1	3.268	60.842	0.941	0.716	0.303	4.562	76.541	7.994	8.297	0.0018
F-1	3.801	60.901	1.000	0.749	0.325	5.074	89.026	9.374	9.688	0.0018
F-1	3.916	60.913	1.012	0.755	0.331	5.189	91.710	9.820	10.136	0.0018
F-1	4.014	60.923	1.022	0.758	0.364	5.299	94.006	12.004	12.321	0.0018
F-1	4.105	60.932	1.031	0.758	0.384	5.414	96.144	13.613	13.932	0.0018
F-1	4.147	60.936	1.035	0.758	0.391	5.470	97.121	14.285	14.604	0.0018
F-1	4.168	60.938	1.037	0.758	0.395	5.499	97.609	14.678	14.998	0.0018
F-1	4.168	60.938	1.037	0.758	0.395	5.499	97.609	14.678	14.998	0.0018
F-1	4.188	60.940	1.039	0.757	0.413	5.529	98.079	16.101	16.421	0.0018
F-1	4.263	60.947	1.046	0.755	0.419	5.646	99.833	17.075	17.397	0.0018
F-1	4.352	60.955	1.054	0.752	0.432	5.789	101.927	18.770	19.093	0.0018
F-1	4.626	60.977	1.076	0.743	0.435	6.226	108.348	20.920	21.247	0.0018
F-1	4.707	60.983	1.082	0.741	0.434	6.352	110.245	21.379	21.707	0.0018
F-1	4.775	60.988	1.087	0.739	0.443	6.463	111.847	22.783	23.112	0.0018
F-1	4.890	60.996	1.095	0.735	0.445	6.649	114.539	23.861	24.191	0.0018
F-1	4.905	60.997	1.096	0.735	0.445	6.673	114.884	24.000	24.330	0.0018
F-1	4.965	61.001	1.100	0.733	0.459	6.774	116.278	26.105	26.436	0.0018
F-1	5.103	61.010	1.109	0.728	0.459	7.014	119.522	27.350	27.682	0.0018
F-1	5.424	61.029	1.128	0.718	0.453	7.553	127.036	29.429	29.766	0.0018
F-1	5.664	61.042	1.141	0.713	0.445	7.942	132.658	30.343	30.681	0.0018
F-1	5.702	61.044	1.143	0.712	0.445	8.003	133.542	30.565	30.904	0.0018
F-1	5.738	61.046	1.145	0.712	0.444	8.064	134.396	30.864	31.203	0.0018
F-1	6.044	61.062	1.161	0.704	0.452	8.589	141.554	34.689	35.032	0.0018

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
F-1	6.056	61.063	1.162	0.702	0.450	8.623	141.845	34.795	35.138	0.0018
F-1	6.433	61.080	1.179	0.697	0.440	9.226	150.669	36.121	36.467	0.0018
F-1	6.756	61.094	1.193	0.693	0.437	9.746	158.237	38.075	38.423	0.0018
F-1	6.830	61.097	1.196	0.693	0.436	9.860	159.961	38.361	38.710	0.0018
F-1	7.471	61.121	1.220	0.692	0.426	10.802	174.972	40.146	40.500	0.0018
F-1	7.526	61.123	1.222	0.692	0.425	10.883	176.271	40.335	40.689	0.0018
F-1	8.449	61.154	1.253	0.694	0.415	12.171	197.879	42.764	43.124	0.0018
F-1	9.009	61.171	1.270	0.698	0.410	12.906	211.001	43.684	44.048	0.0018
F-1	9.452	61.184	1.283	0.701	0.407	13.479	221.365	44.598	44.964	0.0018
F-1	10.007	61.200	1.299	0.705	0.404	14.204	234.376	45.927	46.297	0.0018
F-1	10.721	61.219	1.318	0.711	0.401	15.087	251.105	47.028	47.402	0.0018
F-1	11.113	61.229	1.328	0.714	0.403	15.565	260.282	48.679	49.055	0.0018
F-1	11.359	61.235	1.334	0.716	0.404	15.860	266.043	49.610	49.988	0.0018
F-1	12.252	61.255	1.354	0.726	0.404	16.868	286.963	51.151	51.531	0.0018
F-1	13.121	61.275	1.374	0.733	0.398	17.897	307.308	51.797	52.178	0.0018
F-1	14.430	61.301	1.400	0.749	0.396	19.258	337.968	52.868	53.251	0.0018
F-1	15.600	61.323	1.422	0.764	0.395	20.431	365.364	53.765	54.149	0.0018
F-1	18.600	61.375	1.474	0.799	0.395	23.276	435.643	55.682	56.069	0.0018
F-1	18.902	61.380	1.479	0.802	0.395	23.555	442.711	55.885	56.272	0.0018
F-1	21.855	61.427	1.526	0.833	0.396	26.232	511.865	58.002	58.391	0.0018
F-1	22.377	61.435	1.534	0.838	0.396	26.697	524.102	58.404	58.793	0.0018
F-1	24.508	61.466	1.565	0.859	0.397	28.529	574.008	59.765	60.156	0.0018
F-1	28.855	61.523	1.622	0.902	0.399	31.981	675.819	61.359	61.754	0.0018
F-1	30.817	61.548	1.647	0.919	0.400	33.527	721.759	62.314	62.711	0.0018
F-1	32.810	61.573	1.672	0.935	0.401	35.099	768.453	63.468	63.866	0.0018
F-1	35.216	61.601	1.700	0.955	0.403	36.890	824.806	64.441	64.841	0.0018
F-1	39.920	61.653	1.752	0.991	0.406	40.288	934.980	66.271	66.674	0.0018
F-1	41.460	61.669	1.768	1.003	0.407	41.352	971.037	66.729	67.133	0.0018
F-1	47.162	61.726	1.825	1.043	0.410	45.205	1104.595	68.434	68.841	0.0018
F-1	50.216	61.756	1.855	1.062	0.412	47.276	1176.123	69.634	70.044	0.0018
F-1	51.749	61.771	1.870	1.071	0.412	48.325	1212.005	70.322	70.732	0.0018
F-1	55.689	61.809	1.908	1.091	0.415	51.034	1304.286	72.248	72.660	0.0018
F-1	56.583	61.817	1.916	1.096	0.415	51.613	1325.241	72.544	72.956	0.0018
F-1	63.729	61.877	1.976	1.138	0.418	56.019	1492.594	74.325	74.741	0.0018
F-1	68.267	61.914	2.013	1.161	0.420	58.794	1598.889	75.623	76.041	0.0018
F-1	70.174	61.929	2.028	1.171	0.421	59.931	1643.543	76.112	76.532	0.0018
F-1	80.218	62.003	2.102	1.222	0.425	65.634	1878.781	78.025	78.451	0.0018
F-1	84.667	62.035	2.134	1.242	0.427	68.148	1982.981	79.042	79.470	0.0018
F-1	87.681	62.057	2.156	1.254	0.428	69.896	2053.573	79.928	80.357	0.0018
F-1	92.678	62.094	2.193	1.272	0.430	72.888	2170.618	81.790	82.221	0.0018
F-1	93.514	62.100	2.199	1.274	0.430	73.380	2190.200	82.078	82.509	0.0018
F-1	98.522	62.134	2.233	1.293	0.432	76.193	2307.500	83.446	83.880	0.0018
F-1	111.287	62.212	2.311	1.344	0.436	82.780	2606.458	85.445	85.884	0.0018
F-1	111.448	62.213	2.312	1.345	0.436	82.866	2610.235	85.480	85.919	0.0018
F-1	114.440	62.235	2.334	1.350	0.437	84.764	2680.298	87.102	87.542	0.0018
F-1	120.622	62.272	2.371	1.371	0.439	88.011	2825.105	88.428	88.870	0.0018
F-1	127.239	62.309	2.408	1.394	0.440	91.302	2980.066	89.452	89.897	0.0018
F-1	137.374	62.365	2.464	1.426	0.443	96.363	3217.452	91.290	91.739	0.0018
F-1	139.004	62.374	2.473	1.430	0.443	97.186	3255.613	91.632	92.082	0.0018
F-1	145.648	62.410	2.509	1.449	0.445	100.509	3411.233	92.985	93.437	0.0018
F-1	156.153	62.464	2.563	1.479	0.447	105.579	3657.281	94.777	95.232	0.0018
F-1	158.846	62.480	2.579	1.483	0.448	107.104	3720.349	95.860	96.316	0.0018
F-1	159.660	62.485	2.584	1.484	0.448	107.584	3739.400	96.236	96.692	0.0018
F-1	171.854	62.544	2.643	1.517	0.451	113.317	4025.008	98.108	98.568	0.0018
F-1	178.824	62.575	2.674	1.537	0.452	116.369	4188.242	98.758	99.221	0.0018
F-1	194.282	62.643	2.742	1.578	0.455	123.143	4550.292	100.472	100.942	0.0018
F-1	202.126	62.679	2.778	1.594	0.456	126.786	4734.011	101.938	102.411	0.0018
F-1	206.348	62.697	2.796	1.604	0.457	128.625	4832.885	102.466	102.940	0.0018
F-1	215.055	62.734	2.833	1.624	0.459	132.439	5036.814	103.644	104.120	0.0018
F-1	232.709	62.805	2.904	1.664	0.461	139.865	5450.291	105.557	106.039	0.0018
F-1	234.725	62.813	2.912	1.668	0.462	140.711	5497.506	105.787	106.270	0.0018
F-1	247.411	62.866	2.965	1.690	0.463	146.375	5794.637	107.957	108.443	0.0018
F-1	248.204	62.869	2.968	1.692	0.464	146.699	5813.207	108.038	108.523	0.0018
F-1	267.830	62.941	3.040	1.733	0.466	154.542	6272.861	109.813	110.306	0.0018
F-1	286.342	63.007	3.106	1.769	0.469	161.846	6706.429	111.540	112.038	0.0018
F-1	287.495	63.011	3.110	1.771	0.469	162.293	6733.434	111.638	112.137	0.0018
F-1	303.932	63.071	3.170	1.798	0.471	169.056	7118.415	113.801	114.303	0.0018
F-1	306.628	63.080	3.179	1.803	0.471	170.081	7181.553	114.018	114.521	0.0018
F-1	324.906	63.141	3.240	1.835	0.473	177.087	7609.645	115.688	116.196	0.0018
F-1	340.991	63.194	3.293	1.861	0.475	183.261	7986.368	117.294	117.807	0.0018
F-1	349.850	63.221	3.320	1.877	0.476	186.435	8193.857	117.816	118.332	0.0018
F-1	375.636	63.298	3.397	1.921	0.479	195.566	8797.788	119.343	119.867	0.0018
F-1	397.848	63.362	3.461	1.958	0.481	203.242	9318.020	120.554	121.084	0.0018
F-1	414.033	63.411	3.510	1.979	0.483	209.186	9697.105	122.071	122.605	0.0018
F-1	416.922	63.420	3.519	1.983	0.483	210.287	9764.761	122.412	122.946	0.0018
F-1	437.687	63.479	3.578	2.012	0.485	217.554	10251.104	123.946	124.485	0.0018
F-1	465.111	63.554	3.653	2.050	0.487	226.919	10893.390	125.773	126.320	0.0018
F-1	466.886	63.559	3.658	2.052	0.487	227.548	10934.971	125.932	126.479	0.0018
F-1	483.347	63.605	3.704	2.071	0.489	233.375	11320.502	127.426	127.976	0.0018
F-1	516.323	63.688	3.787	2.116	0.491	244.019	12092.834	129.047	129.605	0.0018
F-1	528.747	63.720	3.819	2.131	0.492	248.162	12383.826	129.897	130.458	0.0018
F-1	544.880	63.761	3.860	2.149	0.493	253.511	12761.682	130.999	131.563	0.0018
F-1	574.946	63.832	3.931	2.187	0.495	262.859	13465.854	132.332	132.904	0.0018
F-1	597.647	63.888	3.987	2.211	0.497	270.315	13997.539	133.978	134.554	0.0018
F-1	605.501	63.906	4.005	2.220	0.497	272.730	14181.491	134.341	134.919	0.0018
F-1	641.309	63.987	4.086	2.261	0.500	283.680	15020.133	136.035	136.621	0.0018
F-1	665.356	64.039	4.138	2.288	0.501	290.778	15583.344	136.943	137.535	0.0018
F-1	691.658	64.099	4.198	2.313	0.503	299.045	16199.377	138.642	139.240	0.0018
F-1	704.643	64.126	4.225	2.327	0.504	302.795	16503.496	139.102	139.702	0.0018
F-1	724.544	64.172	4.271	2.343	0.505	309.229	16969.598	140.679	141.283	0.0018
F-1	759.711	64.239	4.338	2.384	0.507	318.674	17793.246	141.247	141.855	0.0018
F-1	791.304	64.302	4.401	2.415	0.508	327.611	18533.188	142.434	143.044	0.0018
F-1	822.109	64.359	4.458	2.449	0.510	335.746	19254.660	143.027	143.640	0.0018
F-1	853.452	64.416	4.515	2.482	0.512	343.915	19988.750	143.621	144.236	0.0018
F-1	884.732	64.472	4.571	2.514	0.514	351.975	20721.371	144.215	144.832	0.0018
F-1	916.531	64.528	4.627	2.545	0.515	360.067	21466.129	144.808	145.428	0.0018
F-1	962.857	64.610	4.709	2.588	0.518	371.991	22551.145	145.995	146.618	0.0018
F-1	998.200	64.669	4.768	2.622	0.519	380.694	23378.910	146.588	147.215	0.0018
F-1	1034.127	64.729	4.828	2.655	0.521	389.434	24220.363	147.182	147.811	0.0018

Annex D - North Northamptonshire Council LLFA Response

From: [redacted]
Sent: Monday, June 17, 2024 3:29 PM
To: [redacted]
Cc: [redacted] Surface water <swplanning@northnorthants.gov.uk>
Subject: RE: Green Hill Solar Farm - contact/response

> You don't often get email from [redacted]

Hi Joshua,

Please see in red answers to your queries.

- Instances of historic flooding at or near this location; We are pulling this data together and will forward on to you shortly.
- Details of flood defences in the area; Flood defence information is available from the EA here - https://flood-map-for-planning.service.gov.uk/
- Information regarding maintenance of land drains and management of flood risk in the area; Much of this information can be found in our local standards and guidance document (attached) and at https://www.floodtoolkit.com/
- Any restrictions in developing near a IDB owned watercourse; and - You must apply for Land Drainage Consent if you want to: Do work on, over, under or near an ordinary watercourse (within 9 metres of the landward toe of the bank), or make changes to any structure that helps control water.
- Do you have specific requirements for discharge rates to land drains and could you please provide these? – Details of discharge rate requirements can be found in the attached standards and guidance document.

We're happy to arrange a call to discuss your proposals in greater detail. We have availability Wednesday or Thursday this week, I then go on leave and have availability from the 3rd of July onwards.

Kind regards,

[redacted]
Environment Team Leader

E: [redacted]

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Registered office: 2nd Floor, Optimum House, Clippers Quay, Salford, M50 3XP

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
F-1	1070.303	64.788	4.887	2.688	0.523	398.135	25067.631	147.775	148.408	0.0018
F-1	1107.052	64.847	4.946	2.721	0.525	406.872	25928.330	148.369	149.004	0.0018

Tabulated Cross-Section Properties | F-2

(Calculated by Flood Modeller)

Node	Flow (m^3/s)	Stage (m AOD)	Depth (m)	Velocity (m/s)	Froude no.	Area (m^2)	Conveyance (m^3/s)	Width (m)	W Perim. (m)	Slope
F-2	0.000	57.112	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0044
F-2	0.009	57.191	0.079	0.190	0.306	0.048	0.137	1.211	1.238	0.0044
F-2	0.061	57.277	0.165	0.360	0.355	0.169	0.911	1.613	1.679	0.0044
F-2	0.154	57.362	0.250	0.476	0.379	0.324	2.312	2.015	2.120	0.0044
F-2	0.293	57.448	0.336	0.570	0.395	0.513	4.394	2.417	2.560	0.0044
F-2	0.481	57.533	0.421	0.653	0.408	0.737	7.226	2.819	3.001	0.0044
F-2	0.711	57.617	0.505	0.716	0.417	0.993	10.674	3.310	3.526	0.0044
F-2	1.003	57.700	0.588	0.777	0.426	1.291	15.055	3.800	4.051	0.0044
F-2	1.363	57.784	0.672	0.836	0.433	1.629	20.461	4.290	4.576	0.0044
F-2	1.635	57.835	0.723	0.882	0.439	1.853	24.543	4.496	4.807	0.0044
F-2	1.718	57.850	0.738	0.894	0.440	1.921	25.797	4.564	4.881	0.0044
F-2	1.730	57.852	0.740	0.896	0.476	1.931	25.967	5.362	5.680	0.0044
F-2	1.735	57.853	0.741	0.896	0.539	1.937	26.053	6.875	7.194	0.0044
F-2	1.783	57.861	0.749	0.894	0.548	1.994	26.769	7.340	7.663	0.0044
F-2	1.887	57.877	0.765	0.887	0.596	2.128	28.334	9.423	9.755	0.0044
F-2	1.952	57.886	0.774	0.881	0.598	2.216	29.308	10.012	10.351	0.0044
F-2	2.053	57.899	0.787	0.873	0.598	2.351	30.831	10.806	11.155	0.0044
F-2	2.152	57.911	0.799	0.864	0.615	2.490	32.308	12.352	12.709	0.0044
F-2	2.314	57.928	0.816	0.854	0.610	2.711	34.736	13.594	13.964	0.0044
F-2	2.458	57.942	0.830	0.845	0.612	2.911	36.909	14.981	15.360	0.0044
F-2	2.538	57.949	0.837	0.841	0.609	3.017	38.109	15.490	15.875	0.0044
F-2	3.001	57.984	0.872	0.836	0.586	3.591	45.060	17.311	17.723	0.0044
F-2	3.302	58.004	0.892	0.836	0.579	3.950	49.571	18.601	19.028	0.0044
F-2	3.382	58.009	0.897	0.836	0.585	4.045	50.773	19.411	19.842	0.0044
F-2	3.465	58.014	0.902	0.836	0.589	4.144	52.018	20.205	20.640	0.0044
F-2	3.567	58.020	0.908	0.835	0.612	4.273	53.562	22.547	22.987	0.0044
F-2	3.657	58.025	0.913	0.833	0.619	4.389	54.901	23.778	24.221	0.0044
F-2	3.675	58.026	0.914	0.833	0.620	4.412	55.174	24.017	24.462	0.0044
F-2	3.712	58.028	0.916	0.832	0.623	4.461	55.726	24.556	25.002	0.0044
F-2	3.864	58.036	0.924	0.828	0.633	4.666	58.020	26.699	27.152	0.0044
F-2	4.078	58.049	0.937	0.811	0.622	5.028	61.222	29.010	29.474	0.0044
F-2	4.106	58.053	0.941	0.798	0.609	5.145	61.652	29.388	29.856	0.0044
F-2	4.375	58.064	0.952	0.799	0.602	5.474	65.689	30.520	30.997	0.0044
F-2	4.633	58.074	0.962	0.801	0.597	5.785	69.568	31.578	32.063	0.0044
F-2	4.740	58.079	0.967	0.797	0.599	5.946	71.167	32.938	33.427	0.0044
F-2	4.751	58.080	0.968	0.795	0.601	5.979	71.332	33.539	34.029	0.0044
F-2	4.763	58.081	0.969	0.792	0.614	6.014	71.508	35.412	35.903	0.0044
F-2	4.850	58.086	0.974	0.783	0.608	6.194	72.818	36.590	37.085	0.0044
F-2	5.152	58.096	0.984	0.785	0.601	6.566	77.351	37.856	38.359	0.0044
F-2	5.309	58.101	0.989	0.786	0.599	6.757	79.716	38.474	38.981	0.0044
F-2	5.309	58.101	0.989	0.786	0.599	6.757	79.716	38.474	38.981	0.0044
F-2	5.934	58.119	1.007	0.795	0.590	7.466	89.089	40.330	40.851	0.0044
F-2	6.306	58.129	1.017	0.800	0.595	7.882	94.682	42.830	43.360	0.0044
F-2	6.681	58.140	1.028	0.799	0.585	8.359	100.311	43.950	44.488	0.0044
F-2	6.842	58.144	1.032	0.802	0.586	8.537	102.731	44.791	45.333	0.0044
F-2	7.008	58.148	1.036	0.804	0.587	8.718	105.218	45.626	46.171	0.0044
F-2	7.326	58.157	1.045	0.802	0.575	9.130	109.990	45.936	46.490	0.0044
F-2	8.615	58.183	1.071	0.834	0.566	10.335	129.352	46.773	47.349	0.0044

[i] Google Maps
[ii] England | Catchment Data Explorer
[iii] GeoIndex (onshore) - British Geological Survey
[iv] MAGIC
[v] Get flood risk information for planning in England - Flood map for planning - GOV.UK
[vi] Where do you want to check? - Check your long term flood risk - GOV.UK
[vii] Flood alerts and warnings - GOV.UK