One Earth Solar Farm

Volume 6.0 Environmental Statement [EN010159]

Volume 3: Technical Appendices Supporting ES Volume 2

Appendix 7.2: Flood Risk Assessment (FRA) and Outline Drainage Strategy

December 2025

Document Reference: EN010159/APP/6.21.4

Revision 05

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

Report

One Earth Solar Farm

Flood Risk Assessment and Drainage Strategy

For One Earth Solar Farm Ltd

3 December 2025

Document Control

Project Title:	One Earth Solar Farm
Project Number:	14529A
Client:	One Earth Solar Farm Ltd
Principal Contact:	[redacted] (Pershing Consultants)
Document Title:	Flood Risk Assessment and Drainage Strategy
Document Number:	14529A-30-R13-10
Prepared By:	[redacted]
Reviewed By:	[redacted] (Associate Director) and [redacted] (Technical Director)

Revision History

01	24/02/2025	Final
02	30/04/2025	Amended to reflect updated Flood Map for Planning and PINs s55/51 response, dated 3rd March 2025.
03	20/08/2025	Amended to reflect discussions from Issue Specific Hearing 1
04	12/11/2025	Updated in line with discussions with consultees
05	01/12/2025	Updated in line with discussions with consultees

Registered Office: 23 Coldharbour Road, Bristol BS6 7JT Tel: +44(0)117 974 1086

24 Greville Street, Farringdon, London, EC1N 8SS Tel: +44(0)20 3873 4780

First Floor, Patten House, Moulders Lane, Warrington WA1 2BA Tel: +44(0)1925 937 195

8-9 Ship St, Brighton and Hove, Brighton BN1 1AD Tel: +44(0)20 3873 4780

Avenue du Port, 86c Box 204, 1000 Bruxelles Tel: +44(0)20 3873 4784R

Contents

Tables

Figures

1 Introduction

1.1 Scope of report

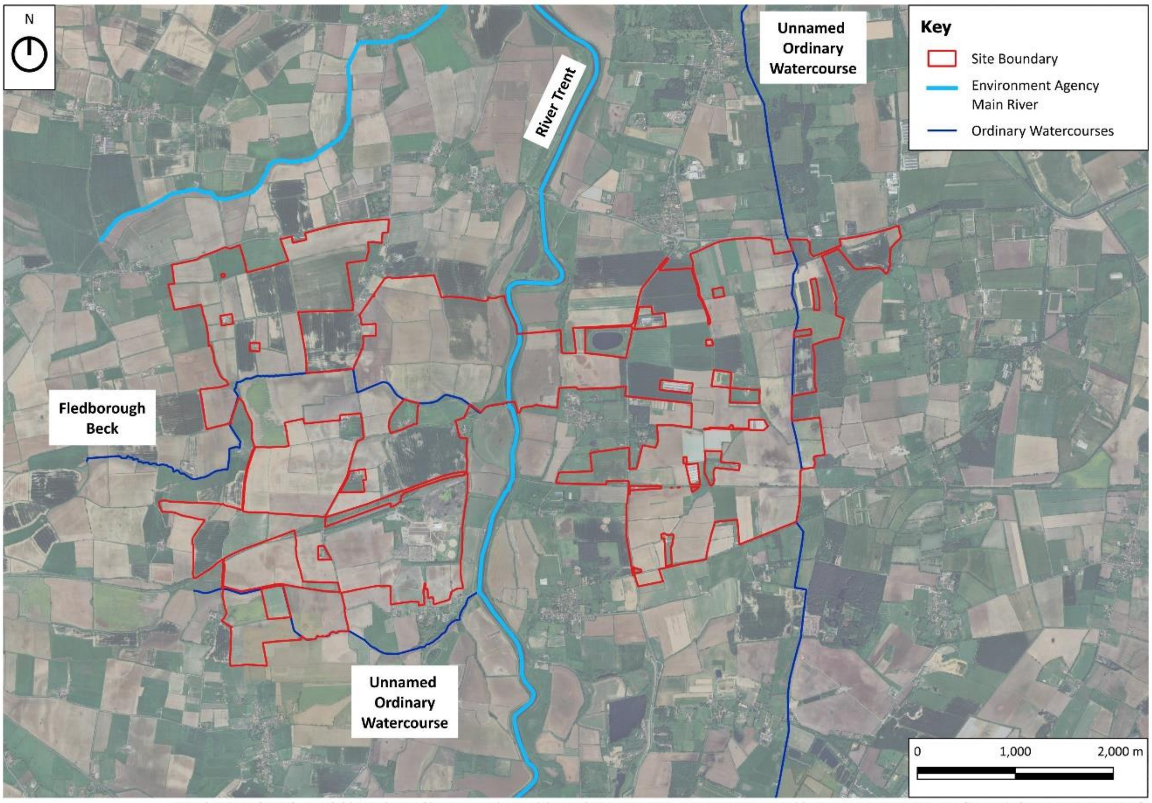
Logika Group Ltd were commissioned by One Earth Solar Farm Ltd to produce a Flood Risk Assessment (FRA) and Drainage Strategy to accompany the planning application for the One Earth Solar Farm Project.

1.2 Site Description

The site (hereafter referred to as 'the Site') covers an area of approximately 1,409 hectares (ha) and is located across two county boundaries. Approximately 1,203ha of the Site lies within Nottinghamshire County Council and the remaining 206ha is located within Lincolnshire County Council.

The Site currently comprises agricultural fields located to the east and west of the River Trent which bisects the Site, flowing from south to north. Hedgerows, trees and woodland form the boundaries to many of the fields within the Site. The Proposed Development Site boundary is shown in **Figure 1-1**.

Figure 1-1: Site Location Plan



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

A topographic Survey was carried out by Above Surveying Ltd and is included in **Appendix A1**.

Given the scale of the Site, ground levels vary considerably across the area. The highest elevation is at approximately 27m Above Ordnance Datum (AOD) east of the River Trent and the lowest elevation is approximately 4.5m AOD along the Trent riverbanks. Ground levels typically fall towards the ordinary watercourses and main river within the Site.

1.3 Development Proposals

The Proposed Development comprises the construction, operation and maintenance, and decommissioning of a solar (PV) array electricity generating facility. The project includes solar PV panels, Battery Energy Storage Systems (BESS), onsite sub-stations and associated grid connection infrastructure which will allow for the generation and export of electricity to the High Marnham sub-station. The Applicant has secured a connection agreement with National Grid which will allow export and import up to 740 megawatts (MW) of electricity to the High Marnham sub-station.

The development proposals are included in **Appendix A2**. For further information regarding the Proposed Development, refer to Volume 1 Chapter 5: Description of development of the Environmental Statement (ES).

1.4 Consultation and Engagement

Throughout preparation of the FRA, consultation and engagement has been undertaken with relevant statutory consultees, which includes the following:

- The Environment Agency (EA) - National Infrastructure Team.
- Nottinghamshire County Council as the LLFA to the majority of the Site.
- Lincolnshire County Council as the LLFA to smaller areas of the Site.

Copies of the meeting minutes are provided in **Appendix A3** and reference is made to the discussions held where appropriate within this report.

1.5 Flood Risk Securing Mechanisms

On the basis that the application is outline in nature, there will be a need to re-confirm certain elements of the Flood Risk Mitigation at detailed design. A requirement has therefore been included within the Development Consent Order (DCO) which includes for these elements to be reassessed in order to confirm that their impacts in connection with flood risk remain in line with the assessment outcomes in this FRA. A copy of this requirement is included below:

Flood risk mitigation

22.-(1) No part of the development authorised shall commence until, for that part, the flood risk mitigation detailed design has been submitted to and approved in writing by the relevant planning authority in consultation with the Environment Agency.

The flood risk mitigation detailed design pursuant to sub-paragraph (1) to include:

(a) the layout of the proposed development and any proposed flood risk mitigation

(b) the layout of solar panel areas and associated updated volumetric loss calculations based on the flood risk mitigation detailed design;

(c) details of the lowest leading edge of solar panels and confirmation that solar panels are above the design flood event (as defined in the flood risk assessment and outline drainage strategy);

The flood risk mitigation detailed design must accord with the flood risk assessment and outline drainage strategy unless it can be demonstrated to the satisfaction of the relevant planning authority in consultation with the Environment Agency that the approval sought would not give rise to any *additional flood risk effects in comparison with those reported in the flood risk assessment and outline drainage strategy unless evidence of a flood risk betterment can be provided.*

In addition, Requirement 5 (Detailed design approval) requires that the details of works must be submitted for approval and must accord with:

(a) Outline design parameters and height parameter plan; and

(b) Any details approved under other requirements, which includes requirement 22 (flood risk mitigation).

The Outline Design Parameters include the following parameter, which links to the Height Parameter Plan, which is informed by the designed flood event. This parameter has been drafted to ensure that where the details approved pursuant to Requirement 22 require the lowest part of the PV panels to be a certain height, those details must be complied with and will take precedence over the maximum heights included in this parameter:

"The height of the lowest part of the PV Panels will not be lower than 0.7m AGL. The maximum height of the lowest part of the PV Panels will be 1.8m AGL, as shown on the Height Parameter Plan [EN010159/APP/2.5], unless a higher maximum height of the lowest part is required in order to comply with Requirement 22 (flood risk mitigation) of the Order, in which case the details approved pursuant to Requirement 22 must be complied with."

With respect to the parameter in the Outline Design Parameters in relation to the Power Conversion Stations (PCS, also referred to as "inverters") units, this provides as follows, and is similarly subject to the details approved pursuant to Requirement 22:

"PCS located within the extent of the designed flood event (as set out in ES Chapter 7 [EN010159/APP/6.7]) will be mounted on stilts (unless an alternate design requirement is required in order to comply with Requirement 22 (flood risk mitigation), in which case the details approved pursuant to Requirement 22 must be complied with) and will not exceed height 6m AGL."

Typically, in detailed design, there is a suitable digital platform that considers topography, infrastructure and flood heights as modelled. This would allow verification of in-field construction against approved detailed design. This process would be refined through detailed design, with reporting and assurance processes agreed with suitable authorities.

2 Planning Policy and Guidance

2.1 National Policy Statement for Renewable Energy Infrastructure (EN-1) (2023)

The Overarching National Policy Statement for Energy (EN-1)[1] serves as a framework for the development of energy infrastructure in the UK. Regarding flood risk and drainage, it highlights a comprehensive approach to addressing and mitigating flood-related challenges to ensure public safety and promote environmental sustainability. Key considerations include:

- **Paragraph 5.8.6:** Flood risk should be considered at all planning stages to avoid inappropriate development in high-risk areas, steering development to areas with lower risk.
- **Paragraph 5.8.7:** Energy infrastructure in flood-risk areas should only be permitted if necessary, ensuring it is safe, operational during floods, and minimizes flood risk overall.
- **Paragraph 5.8.8:** Relocating energy infrastructure from high flood-risk areas to more climate-resilient locations should be supported.
- **Paragraph 5.8.9:** If, following application of the Sequential Test, it is not possible, for the project to be located in areas of lower flood risk, the Exception Test can be applied as defined to allow necessary development to go ahead in situations where suitable sites at lower risk of flooding are not available.
- **Paragraph 5.8.10:** The Exception Test is only appropriate for use where the Sequential Test alone cannot deliver an acceptable site.
- **Paragraph 5.8.11:** To pass the Exception Test it should be demonstrated that:
  - the project would provide wider sustainability benefits to the community that outweigh flood risk.
  - the project will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible will reduce flood risk overall.
- **Paragraph 5.8.12:** Development should be designed to ensure there is no increase in flood risk elsewhere, accounting for the predicted impacts of climate change throughout the lifetime of the development. There should be no net loss of floodplain storage, and any deflection or constriction of flood flow routes should be safely managed within the site. Mitigation measures should make as much use as possible of natural flood management techniques.
- **Paragraph 5.8.15:** The minimum requirements for FRAs are that they should:
  - Be proportionate to the risk and appropriate to the scale, nature and location of the project;
  - Consider the risk of flooding arising from the project in addition to the risk of flooding to the project;
  - Take the impacts of climate change into account, across a range of climate scenarios, clearly stating the development lifetime over which the assessment has been made;

[1] Overarching National Policy Statement for Energy (EN-1) - GOV.UK

    - Be undertaken by competent people, as early as possible in the process of preparing the proposal;
    - Consider both the potential adverse and beneficial effects of flood risk management infrastructure, including raised defences, flow channels, flood storage areas and other artificial features, together with the consequences of their failure and exceedance;
    - Consider the vulnerability of those using the site, including arrangements for safe access and escape;
    - Consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and include information on flood likelihood, speed-of-onset, depth, velocity, hazard and duration;
    - Identify and secure opportunities to reduce the causes and impacts of flooding overall, making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management;
    - Consider the effects of a range of flooding events including extreme events on people, property, the natural and historic environment and river and coastal processes;
    - Include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that these risks can be safely managed, ensuring people will not be exposed to hazardous flooding;
    - Consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of the project may affect drainage systems.
    - Detail those measures that will be included to ensure the development will be safe and remain operational during a flooding event throughout the development's lifetime without increasing flood risk elsewhere;
    - Identify and secure opportunities to reduce the causes and impacts of flooding overall during the period of construction; and
    - Be supported by appropriate data and information, including historical information on previous events.
- **Paragraph 5.8.17:** Development (including construction works) will need to account for any existing watercourses and flood and coastal erosion risk management structures or features, or any land likely to be needed for future structures or features.
- **Paragraph 5.8.24:** In terms of SuDS, development should incorporate where appropriate:
    - Source control measures including rainwater recycling and drainage;
    - Infiltration devices to allow water to soak into the ground, that can include individual soakaways and communal facilities;
    - Filter strips and swales, which are vegetated features that hold and drain water downhill mimicking natural drainage patterns;
    - Filter drains and porous pavements to allow rainwater and run-off to infiltrate into permeable material below ground and provide storage if needed;

  - Basins, ponds and tanks to hold excess water after rain and allow controlled discharge that avoids flooding;
  - Flood routes to carry and direct excess water through developments to minimise the impact of severe rainfall flooding.

- **Paragraph 5.8.26:** Site layout and drainage systems should cope with events that exceed the design capacity, safely managing excess water without negative impacts.
- **Paragraph 5.8.27:** Drainage systems must consider climate change impacts, ensuring surface water discharge rates do not exceed pre-development levels unless equivalent off-site arrangements are implemented.
- **Paragraph 5.8.28:** Surface water storage and infiltration may be needed to reduce discharge rates and total volume, with off-site solutions allowed through planning obligations.
- **Paragraph 5.8.30:** Where a development may result in an increase in flood risk elsewhere through the loss of flood storage, on-site level-for-level compensatory storage, accounting for the predicted impacts of climate change over the lifetime of the development, should be provided.
- **Paragraph 5.8.31:** Where it is not possible to provide compensatory storage on site, it may be acceptable to provide it off-site if it is hydraulically and hydrologically linked. Where development may cause the deflection or constriction of flood flow routes, these will need to be safely managed within the site.
- **Paragraph 5.8.32:** Multifunctional drainage, natural flood management, and green infrastructure can mitigate cumulative flood risks while providing broader benefits.
- **Paragraph 5.8.34:** Applicants should consult with local emergency planning teams, emergency services, and resilience forums when creating evacuation plans for manned energy projects as part of the FRA, ensuring all necessary documents and procedures are identified.
- **Paragraph 5.8.35:** Flood resistant and resilient materials and design should be adopted to minimise damage and speed recovery in the event of a flood.
- **Paragraph 5.8.41:** Energy projects should generally not be approved in Flood Zone 3b or areas predicted to fall within such zones during their lifetime, including areas at risk from other sources of flooding. However, if essential infrastructure must be located in these areas, it should not result in a net loss of floodplain storage or obstruct water flow.

2.2 National Policy Statement for Renewable Energy Infrastructure (EN-3) (2024)

This National Policy Statement (NPS)[2] for Renewable Energy forms part of a suite of energy infrastructure NPSs and should be read in conjunction with EN-1. EN-3 NPS sets out the general principles that should be applied in the assessment of development consent applications for renewable energies. It also provides policies on the way in which any impacts and mitigation measures should be considered. In relation to flood risk and drainage, the guidance sets out the following:

[2] National Policy Statement for Renewable Energy Infrastructure (EN-3) - GOV.UK (www.gov.uk)

- **Paragraph 2.10.84:** Where an FRA has been carried out this must be submitted alongside the applicant's Environmental Statement. This will need to consider the impact of drainage. As solar PV panels will drain to the existing ground, the impact will not, in general, be significant.

- **Paragraph 2.10.85**: Where access tracks need to be provided, permeable tracks should be used, alongside the incorporation of localised SuDS such as swales and infiltration trenches, to control runoff where recommended.

- **Paragraph 2.10.86:** Given the temporary nature of solar PV farms, sites should be configured or selected to avoid the need to impact on existing drainage systems and watercourses.

- **Paragraph 2.10.87:** Culverting existing watercourses/drainage ditches should be avoided.

- **Paragraph 2.10.88:** Where culverting for access is unavoidable, applicants should demonstrate that no reasonable alternatives exist and where necessary it will only be in place temporarily for the construction period.

- **Paragraph 2.10.154:** Water management is a critical component of site design for ground mount solar plants. Where previous management of the site has involved intensive agricultural practice, solar sites can deliver significant ecosystem services value in the form of drainage, flood attenuation, natural wetland habitat, and water quality management.

It is worth noting that there are no policies that specifically relate to Flood Risk and Drainage.

2.3 National Planning Policy Framework

The National Planning Policy Framework (NPPF)[3] was published in 2012 and last revised by the department of Levelling Up, Housing and Communities in February 2025. It states that vulnerable development types should be directed away from areas at highest risk of flooding (whether existing or future risk). Where development is necessary in flood risk areas, the development should be made safe for its lifetime without increasing risk elsewhere.

The NPPF states that, when determining planning applications, Local Planning Authorities should ensure that flood risk is not increased elsewhere as a result of development. Where appropriate, applications should be supported by a site-specific FRA. Development should only be permitted in areas at risk of flooding where it can be demonstrated that:

- Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;

- The development is appropriately flood resistant and resilient;

- Any residual risk can be safely managed; and

- Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

Major developments should incorporate Sustainable Drainage Systems (SuDS) unless there is clear evidence that this is inappropriate. The systems used should:

- Take account of advice from the Lead Local Flood Authority (LLFA);

[3] Ministry of Housing, Communities and Local Government, February 2025. National Planning Policy Framework.

- Have appropriate proposed minimum operational standards;
- Have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development, and;
- Where possible, provide multifunctional benefits.

2.4 Planning Practice Guidance

The Planning Practice Guidance (PPG)[4] notes provide additional advice to Local Planning Authorities, to ensure that the NPPF is applied correctly when assessing development in areas at risk of flooding. Assessments of flood risk should identify sources of current and future risk and describe how these will be accounted for in a mitigation strategy.

A sequential approach should be employed, which involves applying the ‘Sequential Test’ to site selection and, if needed, the ‘Exception Test’. This is designed to ensure that areas at little or no risk of flooding are developed in preference to higher risk areas.

For site-specific risk assessments, the characteristics of a possible flood event should be considered. The ability of residents and users to safely access and exit a building during a ‘design’ flood event and to evacuate before an extreme flood event (0.1% annual probability of flooding with allowance for climate change) should also be assessed.

The ‘design’ flood event is considered to be fluvial flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), or tidal flooding with a 0.5% annual probability (1 in 200 chance each year), plus an allowance for climate change. In addition, the 1% annual probability pluvial event plus climate change should also be considered.

A sequential approach to site layout and design should be undertaken. Development layouts should be designed to locate the most vulnerable aspects of a development within areas of lowest flood risk, unless there are overriding reasons present. In addition, measures to avoid flood risk vertically can be taken by locating the most vulnerable uses on upper levels within a building, and by raising finished floor and/or ground levels where appropriate. Such measures should also account for any residual flood risks occurring due to flood risk management infrastructure.

Management measures, such as safe access and egress routes, should be provided to deal with any residual risk remaining after avoidance, control and mitigation measures have been utilised. The provision of adequate flood warning should also be considered.

Given the scale and the nature of the development proposals, the Proposed Development is considered to have a proposed lifespan of at least 60 years, after which it will be decommissioned.

The PPG provides guidance on flood risk vulnerability and flood zone compatibility. The following flood zones refer to the probability of river and sea flooding, without the presence of defences:

- **Zone 1: low probability**, less than 0.1% annual probability of river or sea flooding (<1 in 1000) in any year;
- **Zone 2: medium probability**, between a 1% and 0.1% annual probability of river flooding (1 in 100 to 1 in 1000) or between a 0.5% and 0.1% (1 in 200 to 1 in 1000) annual probability of sea flooding in any year;

[4] Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government, August 2022, planning Practice and Guidance: Flood Risk and Coastal Change.

- **Zone 3a: high probability**, 1% or greater (>1 in 100) annual probability of river flooding or a 0.5% or greater (>1 in 200) annual probability flooding from the sea in any year; and
- **Zone 3b: functional floodplain**, where water flows or is stored in times of flood, identification should take account of local circumstances but will typically flood with an annual probability of 3.3% (>1 in 30) or greater in any year or is designed to flood in an extreme 0.1% (1 in 1000 annual probability) flood.

Climate change allowances for river flow and rainfall intensity are determined in accordance with the local river management catchment. Allowances are provided to cover development lifespans to the 2050s epoch (from present day to the year 2060) and the 2070s epoch (between 2061 and 2125). The Site is located within the Witham Management catchment and Lower Trent and Erewash Management catchment. The EA's guidance indicates that for the design flood event (1 in 100 year), the following allowances should be applied:

- 32% increase in peak river flows for areas of the Site located within the Witham Management Catchment.
- 39% increase in peak river flows for areas of the Site located within the Lower Trent and Erewash Management Catchment.

When assessing fluvial flood risk, a conservative approach has been taken and an allowance of 39% increase in peak river flows has been used as the design flood event.

Consideration has also been made of the maximum credible climate change scenario, by using the upper end climate change allowance of 62% (for the Lower Trent and Erewash Management Catchment). The upper end climate change allowance for the Witham Management Catchment is 57%, and therefore the higher of the two allowances has been applied to constitute a more conservative assessment of the maximum credible climate change scenario.

Table 2 of the PPG splits flood risk vulnerability into five classifications. The compatibility of these development uses within each Flood Zone is set out in Annex 3 of the NPPF:

- **Essential Infrastructure:** essential transport and utility infrastructure, wind turbines and solar farms;
- **Highly Vulnerable:** emergency services (those required to be operational during flooding), installations requiring hazardous substances consent, basement dwellings;
- **More Vulnerable**: residential dwellings, hospitals, schools, hotels, drinking establishments;
- **Less Vulnerable**: retail, offices, storage and distribution, leisure, restaurants; and
- **Water-Compatible Development**: docks, marinas, wharves, boat clubs.

As the Proposed Development is for the construction and installation of solar photovoltaic panels, with associated BESS and grid connection infrastructure, the proposals are considered to be Essential Infrastructure.

Table 2 of the PPG indicates that development of Essential Infrastructure within all Flood Zones (i.e. Flood Zones 1, 2, 3a and 3b) is acceptable, as long as consideration is made of the exception test. This is discussed in further detail in Section 2.6.

2.5 Non-Statutory Technical Standards for Sustainable Drainage Systems

The Non-Statutory Technical Standards for Sustainable Drainage Systems[5] was published in March 2015 and is the current guidance for the design, maintenance, and operation of SuDS.

Technical standard S3 states that runoff rates from a new development to any drain, sewer or surface water body must be as close as reasonably practicable to the equivalent greenfield runoff rate for the site area. This must be maintained for all rainfall events up to and including the 1 in 100-year event. Accordingly, surface water discharge rates from a new development should never exceed those from the site prior to redevelopment.

Technical standard S5 requires that the runoff volume from developments on a previously developed site, resulting from the 1 in 100 year 6 hour duration storm event, must be attenuated to a value as close as is reasonably practicable to the equivalent greenfield runoff volume. The post development runoff volume must not exceed the runoff volume from the site prior to redevelopment. However, Technical Standard S6 states that where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer, or surface water body in accordance with Technical Standards S4 or S5, the runoff volume most be discharged at a rate which does not adversely affect flood risk.

Standards also indicate that drainage systems should be designed to ensure that flooding does not occur on any part of a site for a 1 in 30-year rainfall event (standard S7) and that flooding of a building (including the basement and utility plant) does not occur during a 1 in 100-year rainfall event (standard S8). Technical standard S12 states that pumping should only be used as part of a surface water drainage system where it is not reasonably practicable to discharge runoff via gravity.

2.6 Sequential and Exception Test

The Sequential Test has been applied and is set out within the Planning Statement [APP-168], the Sequential and Exception Test Assessment [REP2-080] and the Sequential Test Addendum [REP3-069]. To summarise, the secured grid connection at High Marnham power station has been used as the starting point for site selection. Existing grid connection points with spare capacity are finite, and should be utilised wherever possible to fulfil the need for new renewable energy development.

As set out in the Planning Statement [APP-168], a 10km radius from the point of connection was initially used to search for suitable areas of land for NSIP scale solar development, driven by the desire to be as close to the point of connection as possible, in order to minimise the risk of environmental impacts, disruption to multiple landowners, challenges with crossings and process losses, and the cost and delay of a longer cable route. The majority of land to the north, east and south within the 10km radius capable of siting large areas of Solar PV Development were also located in areas of Flood Zone 2 and 3. Areas of Flood Zone 1 were identified, however were not of a size that could accommodate NSIP scale solar development or were not available or suitable for the Proposed Development. Larger areas of land to the west within the 10km radius were located in Flood Zone 1, however accounting for wider sustainable development objectives, there is clear reasoning for discounting development within these areas, as set out in detail within the Planning Statement [APP-168].

The Applicant submitted a detailed Sequential and Exception Test Assessment [REP2-080] at Deadline 2 and a further Sequential Test Addendum [REP3-069] at Deadline 3 which sets out how the Applicant identified 17 potential alternative sites of various sizes (to explore the potential of a series of smaller sites) within an extended 15km radius from the point of connection, and assessed each site in terms

[5] Department for Environment, Food and Rural Affairs, March 2015. Non-statutory technical standards for sustainable drainage systems (available at: Sustainable Drainage Systems: Non-statutory technical standards for sustainable drainage systems (publishing.service.gov.uk)

of the suitability for a similar sized solar development and availability to deliver within the same timeframes. Sites wholly, predominately or partially within Flood Zone 2 and 3 were discounted because they were not sequentially preferable to the Proposed Development site, but not for this reason alone. Other matters such as, but not limited to, agricultural land, landscape and visual considerations, network connection and ecological designations were also considered. The conclusion reached by the Applicant was that there are no reasonably available sites, suitable for the Proposed Development, in a lower flood zone as an alternative to the Order Limits. The approach taken to date is proportionate, and the Applicant must balance a wide range of considerations when selecting a site, which was done carefully and robustly both at site selection stage and during Examination.

In light of the above, the Sequential Test has been applied and satisfied as part of site selection. More vulnerable elements of the development have been sequentially located within the Order Limits, in areas of lower flood risk.

In line with Table 2 of the PPG, 'Essential Infrastructure' is considered appropriate in areas of Flood Zone 3 provided the Exception Test is passed. The Exception Test states that it should be demonstrated that:

a) Development in a flood risk area will provide wider sustainability benefits to the community that outweigh flood risk; and

b) The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

The Proposed Development will provide wider sustainability benefits to the community by delivering a new source of sustainable energy and supporting the energy sector with the provision of battery storage. Significant renewable energy schemes at scale are required to be able to meet the legally binding commitment to Net Zero and make energy more affordable and reliable for all. The Proposed Development also delivers local community and biodiversity benefits through biodiversity net gain and environmental enhancements.

Flood risk mitigation measures (outlined in Sections 3 and 4 of this report) have been incorporated into the design to demonstrate that the development will remain safe for its lifetime (including climate change) and will not increase flood risk. For further information on the application of the Exception Test, refer to the Planning Statement [EPP-168], the Sequential and Exception Test Assessment [REP2-080] and the Sequential Test Addendum [REP3-069].

2.7 Local Planning Policy and guidance

2.7.1 Newark and Sherwood District Council Local Development Framework, Amended Allocations and Development Management Development Plan Document (AADMDPD) (September 2023)

The amended version of the local Development Plan Document[6] (DPD) has been compiled to ensure that the wider development framework within Newark and Sherwood District Council sufficiently allocates land for development to meet the needs of the area, up until 2033.

In relation to Flood Risk and Drainage, the DPD sets out the following policies:

DM5(b) 10. Flood Risk and Water Management

[6] 2nd-Publication-AADMDPD---being-printed.pdf (newark-sherwooddc.gov.uk)

- The Council will aim to steer new development away from areas at highest risk of flooding. Development proposals within EA Flood Zones 2 and 3 and areas with critical drainage problems will only be considered where it constitutes appropriate development and it can be demonstrated, by application of the Sequential Test, that there are no reasonably available sites in lower risk Flood Zones.
- Where development is necessary within areas at risk of flooding it will also need to satisfy the Exception Test by demonstrating it would be safe for the intended users without increasing flood risk elsewhere and where possible, pursue opportunities to reduce flood risk overall.
- All applications for new development shall demonstrate that all surface water discharges have been carried out in accordance with the principles laid out within the drainage hierarchy, in such that a discharge to the public sewerage systems are avoided, where possible.
- All major developments shall ensure that SuDS are incorporated to manage surface water runoff, unless demonstrated to be inappropriate.
- All schemes for the inclusion of SuDS should demonstrate they have considered all four aspects of good SuDS design, Water Quantity, Water Quality, Amenity and Biodiversity. SuDS and development should complement the existing landscape.
- The completed SuDS schemes should be accompanied by a maintenance schedule.

2.7.2 Newark & Sherwood District Council, Amended Core Strategy Development Plan (2019)

The Amended Core Strategy (ACS)[7] for Newark and Sherwood District is part of the Local Development Framework for the area. This strategy outlines the overarching issues and objectives to address over a 20 year period, contextualising this into a wider vision, series of objectives and core policies toward delivery.

In relation to flood risk and drainage, the amended ACS sets out the following policy:

Core Policy 9 Sustainable Design

The District Council will expect new development proposals to demonstrate a high standard of sustainable design, which both protects and enhances the natural environment, alongside contributing to and sustaining the rich local distinctiveness of the District. Therefore all new development should:

- Achieve a high standard of sustainable design and layout that is capable of being accessible to all, and of an appropriate form and scale to its context, complementing the existing built and landscape environments;
- Through its design, proactively manage surface water including, where feasible, the use of SuDS; and
- Provide development that proves to be resilient in the long-term, taking into account the potential impacts of climate change and the varying needs of the community.

[7] ACS2019.pdf (newark-sherwooddc.gov.uk)

2.7.3 Central Lincolnshire Local Plan (Adopted April 2023)

The Local Plan[8] for the central Lincolnshire area sets out the approach to planning policy, and overarching development allocations to drive growth in the area over a 20 year period. The Local Plan is contextualised into a wider vision, series of objectives, and core policies toward delivery.

Specific policies detailed in the Local Plan and relevant to flood risk and drainage are set out below:

Policy S21 Flood Risk

All development proposals will be considered against the NPPF, including application of the sequential and, if necessary, the exception test. Through appropriate consultation and option appraisal, development proposals should demonstrate:

- That they are informed by and take account of the best available information from all sources of flood risk and by site specific flood risk assessments where appropriate;
- That the development does not place itself or existing land or buildings at increased risk of flooding;
- That the development will be safe during its lifetime taking into account the impacts of climate change, and will be resilient to flood risk from all forms of flooding, such that in the event of a flood the development could be quickly brought back into use without significant refurbishment;
- That the development does not affect the integrity of existing flood defences, and any necessary flood mitigation measures have been agreed with the relevant bodies;
- How proposals have taken a positive approach to reducing overall flood risk and have considered the potential to contribute towards solutions for the wider area; and
- That they have incorporated SuDS/Integrated Water Management into the proposals unless they can be shown to be inappropriate.

2.7.4 Bassetlaw Local Plan 2020-2038

The Bassetlaw Local Plan[9] was adopted by the Council on 29 May 2024. It sets out the Council's planning and policy framework, development strategy and site allocations to inform effective delivery of the overall vision up until 2038.

Policies relating to Flood Risk and Drainage are set out below:

Policy ST50: Flood Risk and Drainage

Proposals are required to consider and, where necessary, mitigate the impacts of the Proposed Development on flood risk, on-site and off-site, commensurate with the scale and impact of the development. Proposals must be accompanied by an FRA (where appropriate), which demonstrates that the development, including access and egress, will be safe for its lifetime, without increasing or exacerbating flood risk elsewhere and where possible will reduce flood risk overall.

[8] Local Plan for adoption Approved by Committee.pdf (n-kesteven.gov.uk)
[9] adopted-bassetlaw-local-plan-2020-2038.pdf

Where relevant, proposals must demonstrate that they pass the Sequential Test and if necessary, the Exception Test in Flood Zones 2 and 3. Proposals should also ensure that where land is required to manage flood risk, it is safeguarded from development.

Surface Water Flood Risk:

All development where practicable should incorporate SuDS in line with national standards. These should:

- Be informed by the LLFA, sewerage company and relevant drainage board;
- Have maintenance arrangements in place to ensure an acceptable standard of operation and management for the development's lifetime;
- Prevent surface water discharge into the sewerage system;
- Maximise environmental gain through: enhancing the green/blue infrastructure network, including urban greening measures, contributing to biodiversity net gain where possible, and, securing amenity benefits along with flood storage volumes; and
- Seek to reduce runoff rates in areas at risk from surface water flooding, and that any surface water is directed to sustainable outfalls.

2.7.5 Bassetlaw District Level 1 Strategic Flood Risk Assessment (2019)

The Bassetlaw District Level 1 SFRA was adopted in January 2019, and its key objectives include the following:

- To replace the Council's 2009 Level 1 SFRA, taking into account the most recent policy and legislation in the NPPF.
- To collate and analyse the latest available information and data for current and future (i.e. climate change) flood risk from all sources, and how these may be mitigated.
- To inform decisions in the emerging Local Plan, including the selection of development sites and planning policies.
- To provide evidence to support application of the Sequential Test for the allocation of new development sites, to support the Council's preparation of the Local Plan.
- To provide a comprehensive set of maps presenting flood risk from all sources that can be used as an evidence base for use in the emerging Local Plan.
- To provide advice for applicants carrying out site-specific FRAs, and outline specific measures or objectives that are required to manage flood risk.

2.7.6 Newark and Sherwood District Level 1 SFRA (Review 2016)

The Strategic Flood Risk Assessment (SFRA)[10] update for Newark and Sherwood District Council (NSDC), produced in December 2016, is an essential document that updates the initial Level 1 SFRA and provides a comprehensive analysis of flood risks across the district. This updated assessment integrates new flood data and helps the council in guiding land use planning, particularly in identifying flood risk areas that may influence future developments. It is particularly used to inform

[10] ENV.01-Strategic-Flood-Risk-Assessment-Review-Dec-2016.pdf (newark-sherwooddc.gov.uk)

both the planning process and the review of development plans, ensuring that flood risk is appropriately considered in local planning decisions.

2.7.7 West Lindsey Level 1 SFRA (2009)

The West Lindsey Level 1 SFRA[11], prepared by AECOM and published in 2009, assesses the risk of flooding across the district to guide planning decisions. It focuses on identifying areas within the district that are at risk from flooding, categorizing land into four flood zones according to flood probability (from low to high risk). The assessment uses various sources, including the Environment Agency's flood maps, local drainage boards, and hydraulic models of flood risk from rivers and tidal sources.

The SFRA also addresses the potential costs of improving flood defences, with the goal of meeting minimum protection standards for future urban development. It supports the local planning authorities in making informed decisions about where to allocate development, ensuring that flood risk management is integrated into land-use planning in the region.

2.7.8 Joint Lincolnshire Flood Risk and Water Management Strategy 2019-2050

The existing Joint Lincolnshire Flood Risk and Drainage Management Strategy[12] was developed as a partnership venture during 2011 and 2012, and was approved for the County Council by the Executive on 4 December 2012 and by Full Council in January 2013. The strategy continues to be updated annually and coordinates all the work delivered by the Lincolnshire flood risk and water management partnership as a whole, overseen by the flood risk and water management scrutiny committee.

The purpose of the strategy is to manage the impact of flood risk to people, businesses and the environment across Lincolnshire. Consideration of this document has been made where appropriate within this assessment.

[11] Microsoft Word - Final 001G.doc (west-lindsey.gov.uk)
[12] Joint flood risk water management strategy 2019-2050 (lincolnshire.gov.uk)

3 Flood Risk

3.1 Tidal and Fluvial

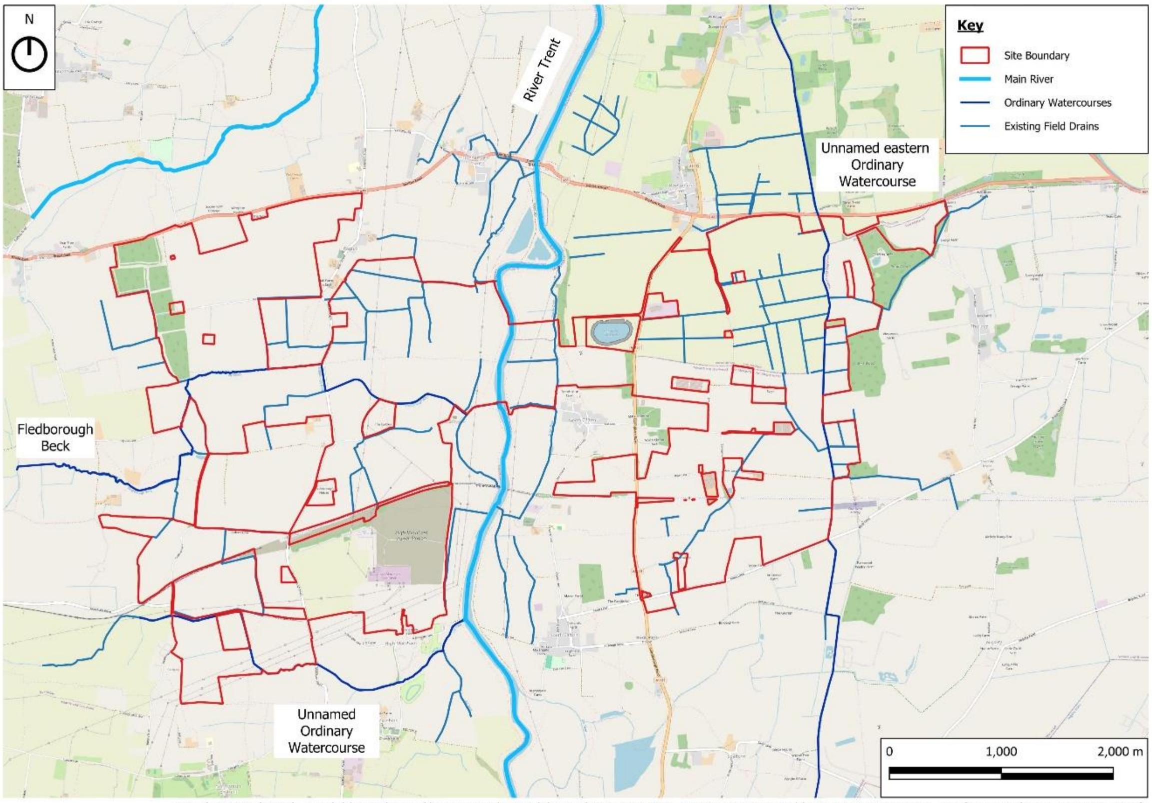
3.1.1 Existing Watercourses and Flood Defences

Existing Watercourses

There are a number of existing watercourses within the Site boundary and in the near vicinity. These are illustrated in **Figure 3-1** and summarised below:

- The River Trent – A main river which flows in a northerly direction through the centre of the Site.
- The Fledborough Beck – An ordinary watercourse which flows west to east through the central areas of the western parcel of the Site, before ultimately discharging to the River Trent.
- An unnamed ordinary watercourse which flows west to east through the southern area of the western parcel of the Site. This ordinary watercourse ultimately discharges to the River Trent.
- An unnamed ordinary watercourse which flows in a northerly direction through the eastern area of the Site. This ordinary watercourse is a tributary of the Foss Dyke which ultimately connects to the River Trent approximately 4km north of the Site.
- A number of field drains and ditches within the Site itself which are ultimately in connectivity with either the ordinary watercourses noted above or the River Trent.

Figure 3-1: Main River and Existing Watercourses



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

As part of the development proposals, any works to the existing watercourses are to be limited however, there may be a requirement to undertake the following:

- Proposed surface water drainage outfalls from areas of significant hardstanding (such as the sub-station and battery storage areas). Surface water discharges from these areas will be restricted in line with relevant policy.
- Bridging over watercourses to facilitate access. These have been kept to a minimum and any openings required will be sized accordingly to ensure there would be no constraint to flows.
- Two artificial otter holts are proposed on the ditch network and a new ditch is proposed to be dug in the ecological mitigation area (floodplain grazing marsh) near the River Trent.
- Works to desilt the watercourses are proposed and vegetation clearance on the banks will likely be required.
- Ecological enhancement in the form of scrapes to create wetland habitat, although it is not envisaged that these would have any connectivity with the existing watercourses.

With regards to any proposed permanent bridging over watercourses, these would be designed so that the soffit level (underside) sits above the design flood level (i.e. 1 in 100 year plus 39% climate change event). The design flood level will be determined using the Tidal Trent Model where possible however, the need for localised hydraulic modelling to determine the flood level and associated soffit level for crossings over ordinary watercourse (such as ditches and field drains) will be reviewed when the crossing/bridge locations are confirmed at detailed design.

The above measures are not considered to have a negative impact to the capacity of the watercourses or quality of water flowing within them. For any direct works to any Main River or within 16m from a tidal Main River, a Flood Risk Activity Permit (FRAP) from the EA would ordinarily be required. However, it is proposed that the need for FRAPs under the Environmental Permitting (England and Wales) Regulations 2016 would be disapplied in Article 6 of the draft DCO [EN010159/APP/3.1] subject to agreement by the EA pursuant to s150 of the Planning Act 2008, provided that satisfactory forms of protective provisions are agreed. Engagement with the EA regarding this is ongoing however, will be finalised at detailed design.

Furthermore, for any works to any ordinary watercourse, Ordinary Watercourse / Land Drainage Consent would ordinarily be sought from Trent Valley Internal Drainage Board (IDB). Instead, it is proposed that the requirement for Land Drainage Consent, in particular Sections 23, 32 and bylaws made under Section 66, would be disapplied, provided that satisfactory forms of protective provisions are agreed with the IDB. Engagement with the IDB regarding this is ongoing however, will be finalised at detailed design.

To ensure that access and ecological corridors are maintained, it is proposed that the following buffers will be provided between the top of bank of watercourses and any built development ((i.e. panels, sub-stations, inverters and battery storage).

- A minimum 10m buffer from all ordinary watercourse and field drains/ditches, (in excess of the 9m required within Trent Valley IDB's Byelaws).
- A minimum 16m buffer from the River Trent (main river). It is worth noting that the buffers from the River Trent actually extend far beyond the 16m minimum.

Existing Flood Defences

As illustrated in **Figure 3-2**, there are a number of formal flood defences associated with the River Trent. These defences are predominantly in the form of raised embankments and are shown broadly to be in a fair to good condition. The only exception to this, is the Fledborough Embankment which is shown to have a poor condition, however, no details have been provided by the EA to confirm the reasoning behind this classification. This section of defences does not lie within the Site boundary. All defences with the Site boundary are classified in a fair to good condition.

The Standard of Protection (SoP) of the flood defences is illustrated in **Figure 3-2** and varies from 1 in 5 years through to 1 in 100 years. It is worth noting that the defences in the northern areas of the western bank of the River Trent tend to provide a higher SoP (1 in 100 year) with the remaining defences providing a 1 in 5 year SoP (note this includes the Fledborough Embankment noted above, which is shown to have a poor condition rating).

To ensure that impacts on the existing defences are minimised and that access is not restricted, significant offsets (minimum of 16m) have been provided between the defences and any built development.

As part of the Proposed Development, there will be a need for a single cable crossing beneath the River Trent and a number of other crossings beneath ordinary watercourses. These crossings will be undertaken using trenchless techniques, the following measures and further assessment will be provided to inform the crossing designs and mitigate the potential impacts on existing watercourses and flood defences (including their foundations):

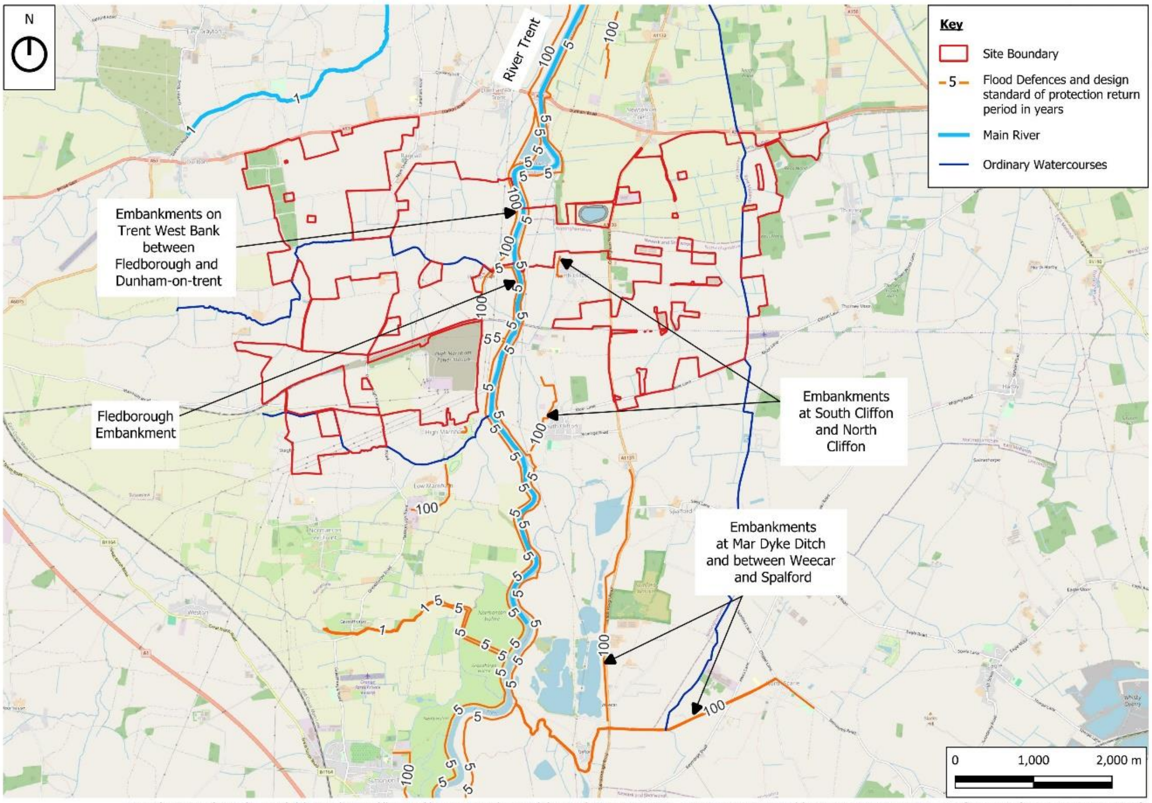
- A pre-works hydro morphology survey will be carried out for each watercourse to ensure the correct depth for passing under the watercourse.
- A hydrogeological risk assessment will be produced prior to detailed design which will include a site-specific hydraulic fracture risk assessment to define the methodology and mitigation required on ground conditions.
- A tidal riverbed survey will be required prior to the works under the River Trent.
- For the cable route crossings, the launch and receiving pits will typically be a maximum size of 120m x 80m and 50m x 70m respectively, subject to detailed design.
- The launch and receiving pits will be a minimum of 16m from the watercourse edge.
- The cable route crossing of the River Trent will be a minimum of 5m below the bed of the river.
- For other smaller watercourses, the crossing will be a minimum of 2.5m below the bed of the watercourse
- There is a small risk of drilling fluid break out from drilling to the watercourse if not appropriately mitigated for site specific conditions. Also included in this CEMP will be a bentonite fluid breakout plan and an emergency spillage response procedure.

Although the trenchless solution and likely depth is anticipated to mitigate impacts to the existing defences, surveys of the defences can be undertaken at detailed design to confirm this and monitoring during construction can be undertaken if deemed required.

It is understood that the EA conducts regular inspections and maintenance of these flood defences to ensure their continued effectiveness in mitigating flood risks. These inspections help to verify that the defences are capable of withstanding both current conditions and potential future challenges, such as the impacts of climate change and extreme weather events.

The impact that these defences have on flood risk to the area is discussed in further detailed under the following headings.

Figure 3-2: Existing Flood Defences in the vicinity of the Site



Google Maps (2025). Available at: https://https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

It is worth noting that residents of North Clifton have suggested that there is a flood/drainage gate in the area that is operated by the EA in times of flood, to prevent floodwater from backing up within the villages drainage system and causing further flooding. Following discussions with the EA, they have confirmed that they do not own or operate any flood gates in the vicinity of North Clifton but have indicated that there are two culverts where the Sewer Dyke discharges to the River Trent which include flap valves on their outfalls. Flap valves are passive features and function based on pressure differences between the upstream and downstream conditions of the outfall (i.e. as flood waters rise on the downstream side, the flap valve will not open due to the pressure difference which prevents back flow of flood water). Flap valves do not require active intervention to function and the EA have confirmed that their access to maintain these features will not be impacted by the Proposed Development.

Images submitted by residents suggest that the EA gate is located along Trent Lane however, the EA have indicated that they do not believe that this is an asset used by the EA to prevent surcharging of the River Trent.

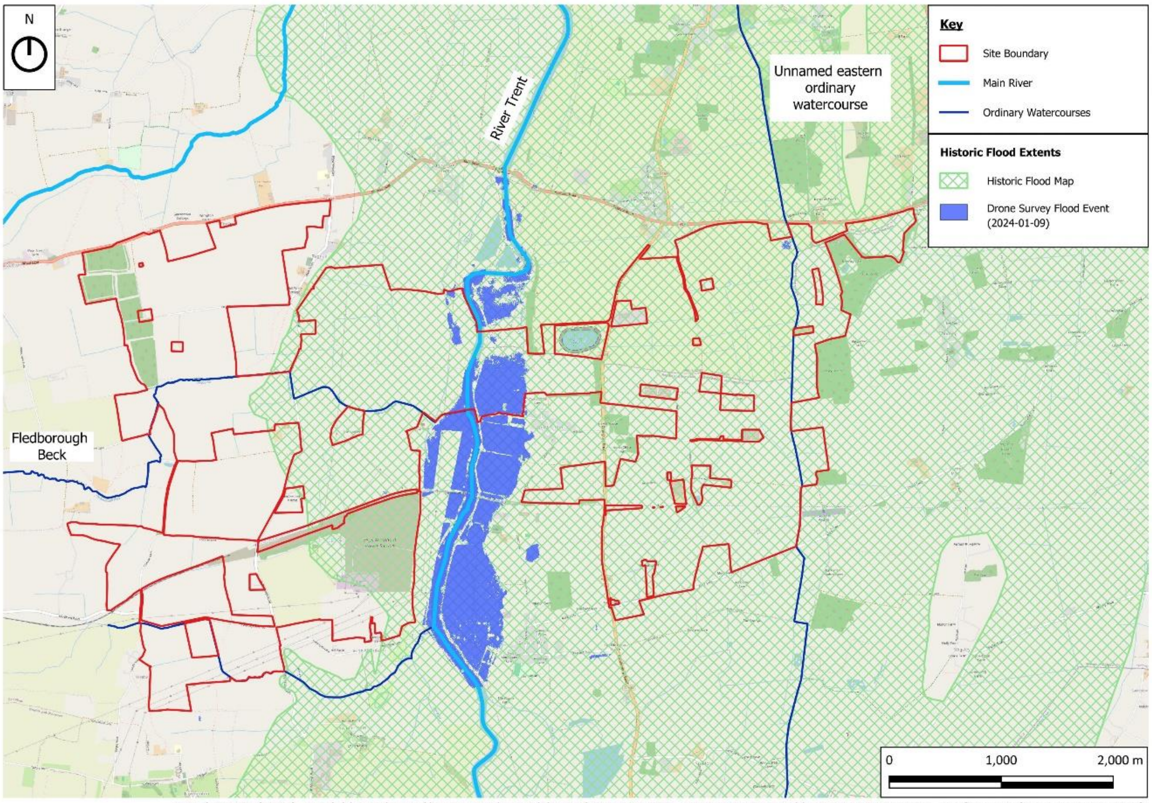
3.1.2 Historic Flooding

The EA's historic flood records, indicate that the Site has been affected by flooding in the past (**Figure 3-3**) which is understood to be fluvially dominated and associated with high water levels within the River Trent and ordinary watercourses. For ease of viewing, the historic flood events are shown as one outline as the extents overlap in many areas, however, the individual events that are recorded on the EA's mapping to have occurred within the Order Limits are listed below:

- February 1795
- January 1932
- January and March 1947
- January and February 1977
- November 2000
- November 2019
- October 2023
- January 2024

The most recent flooding at the Site occurred in January 2024 and was as a result of several days of intense rainfall that began in late December 2023, causing high-water levels within the River Trent and existing ordinary watercourses. The extent of this flooding was captured via drone survey and is illustrated in **Figure 3-3** below. The drone survey was undertaken approximately 5 days following the onset of flooding and may therefore not represent the maximum extent and peak flooding but still provides a useful insight.

Figure 3-3: Environment Agency's historic Flood Map and Drone Survey Flood Event



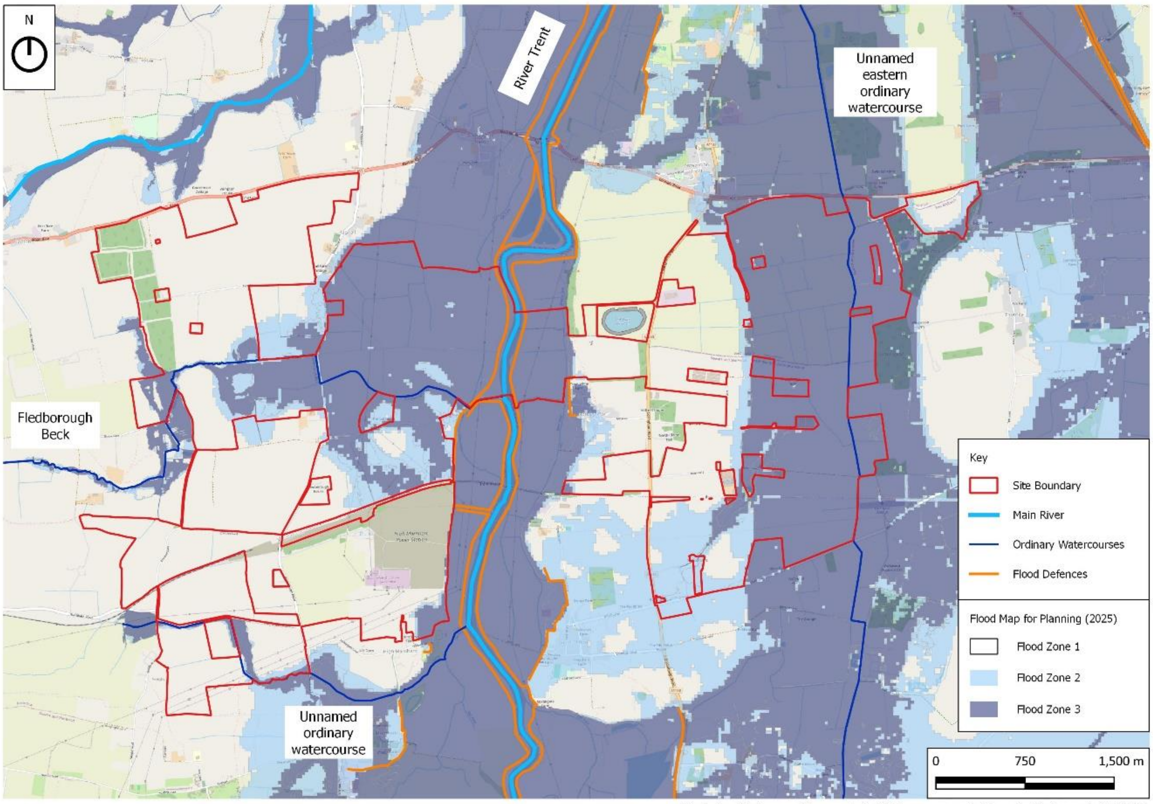
Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

3.1.3 Flood Map for Planning

The EA's Flood Map for Planning (**Figure 3-4**) indicates that large areas of the Site are situated within Flood Zone 2 and 3, indicating a medium to high probability of flooding from fluvial and tidal sources. Flooding in these areas is predominantly associated with the River Trent as well as existing watercourses which are in hydraulic connectivity with the River Trent.

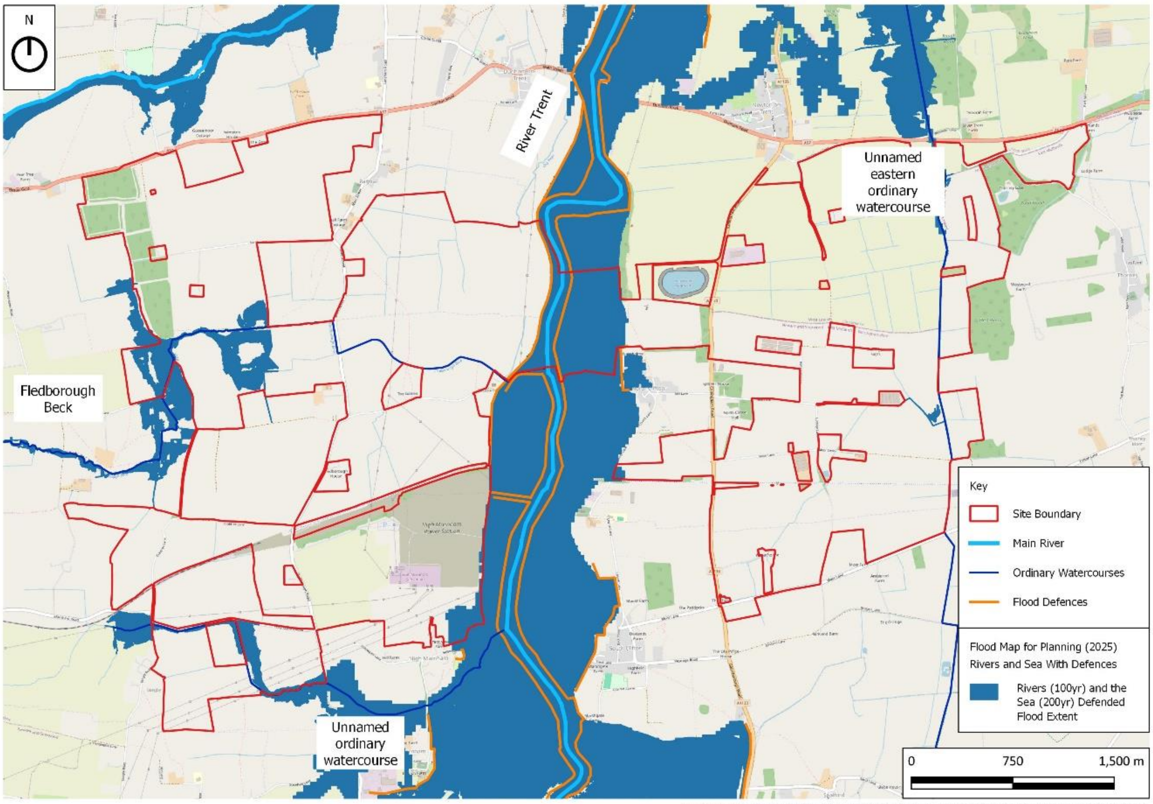
As noted previously, there are a number of flood defences in the vicinity of the Site which offer varying levels of protection, as shown in **Figure 3-2**. In addition to Flood Zones 2 and 3, the updated Flood Map for Planning includes a 'river and sea with defences' dataset, which takes into account the presence of flood defences and assumes that they operate in the way they were designed to function. The Flood Map for Planning River and Sea with Defences dataset for the present day defended 1 in 100 year (rivers) and 1 in 200 year (the sea) events is included as **Figure 3-5**.

Figure 3-4: Environment Agency's Flood Map for Planning



Contains Ordnance Survey data © Crown copyright and database right 2025

Figure 3-5: Flood Map for Planning River and Sea With Defences – Present Day 1 in 100 year (rivers) and 1 in 200 year (sea) extents



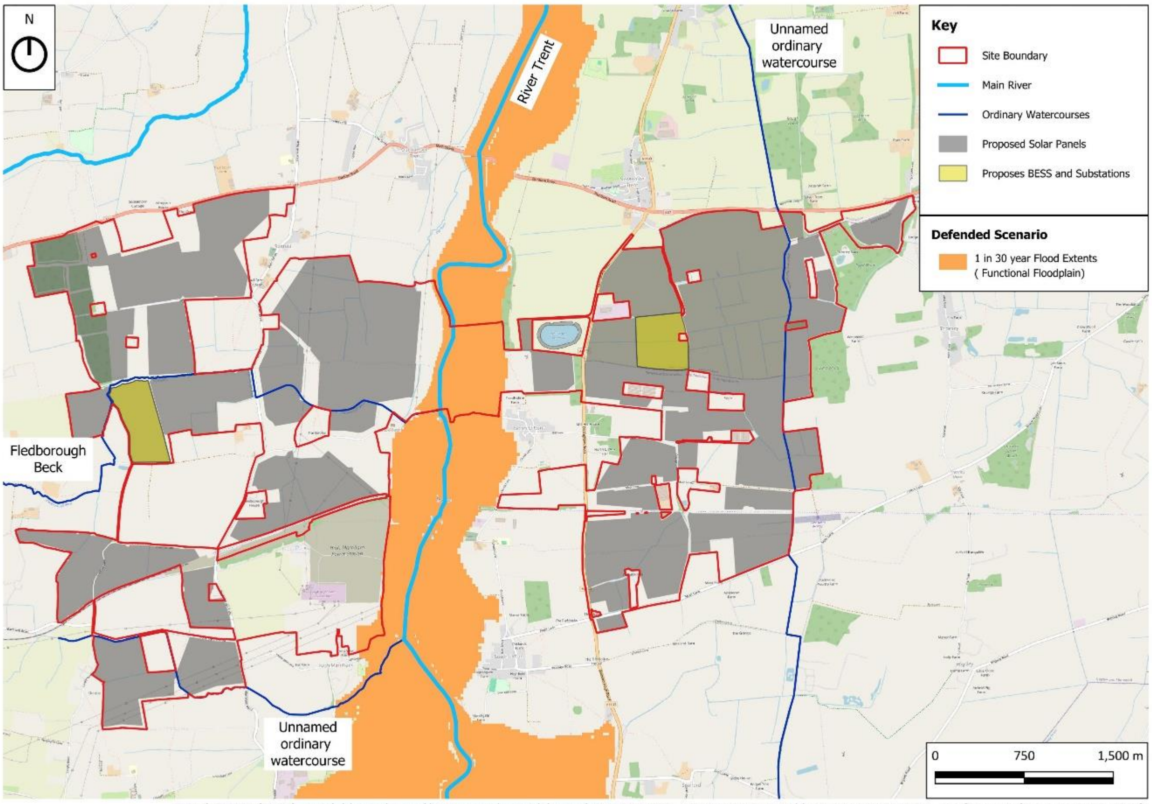
Through consultation with the EA, the model outputs for the Tidal Trent (2023) have been provided and used to inform the assessment of flood risk and mitigation requirements. As part of the model review, it is concluded that although there is a slight tidal influence at the Site, fluvial sources are considered to be the dominant source of flooding.

3.1.4 Functional Floodplain (Flood Zone 3b)

The SFRA for Bassetlaw District Council defines the functional floodplain (Flood Zone 3b) as land which would flood with a 5% chance in each year and every year (i.e. a 1 in 20 year Annual Exceedance Event). However, since the production of the SFRA, guidance (set out by the EA) for the assessment of the functional floodplain has changed. Therefore, to ensure that the assessment is in line with the EA's current recommendations, the 1 in 30 year event has been considered to represent the functional floodplain (refer to **Figure 3-6**).

As illustrated in **Figure 3-6**, no built development is proposed within the functional floodplain.

Figure 3-6: Functional Floodplain (Defended Scenario 1 in 30 year fluvial flood extent)

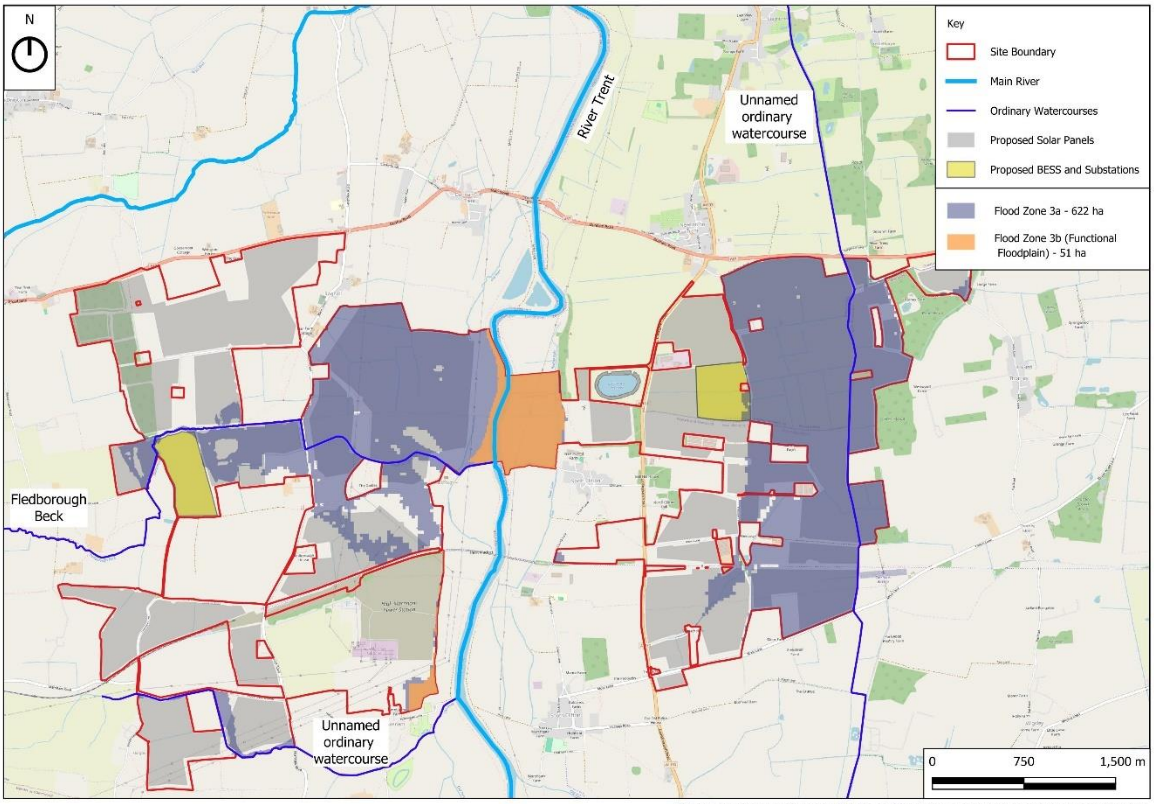


Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

Figure 3-7 overleaf distinguishes areas of Flood Zone 3a and Flood Zone 3b. For clarity, the area associated with each of these and within the Order Limits is as follows:

- Flood Zone 3a – 622 ha (note that Flood Zone 3a also includes the 51 ha area associated with Flood Zone 3b)
- Flood Zone 3b – 51 ha

Figure 3-7: Flood Zone 3a and 3b Designation within Order Limits



Contains Ordnance Survey data © Crown copyright and database right 2025

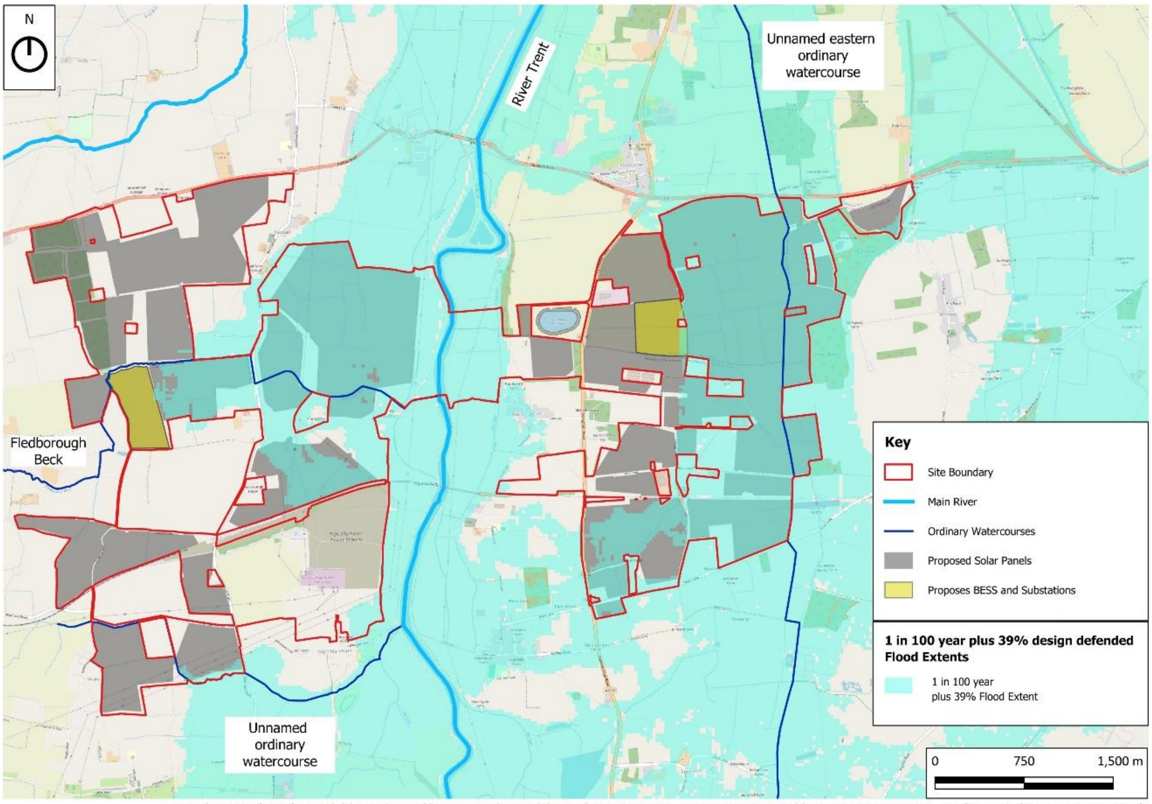
3.1.5 Design Flood Event and Maximum Credible Scenario

Design Flood Event

As noted previously, the design flood event for the Site is the 1 in 100 year plus 39% climate change scenario. This event has been considered when determining the impact to development as well as any mitigation requirements.

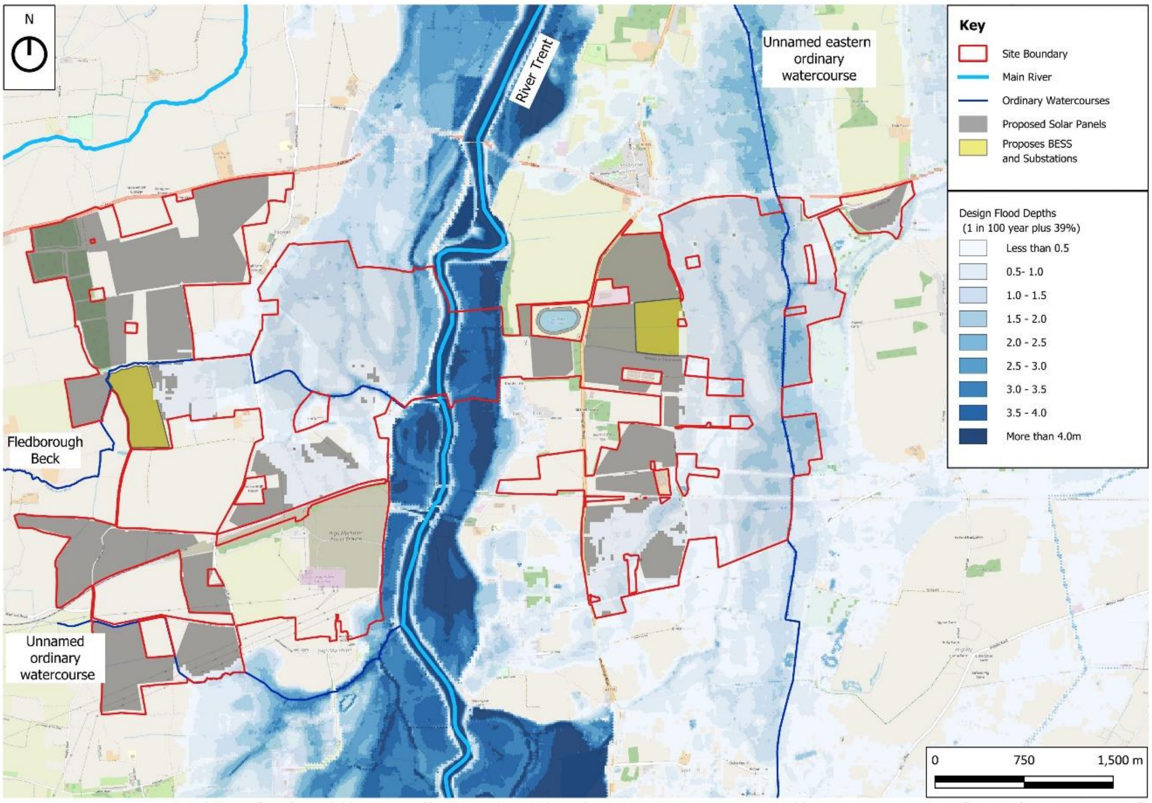
The flood extents and depths for the design flood event are illustrated in **Figure 3-8** and **Figure 3-9** below.

Figure 3-8: Design Flood Extent (1 in 100 year plus 39% Climate Change)



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

Figure 3-9: Design Flood Depths (1 in 100 year plus 39% Climate Change)



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

Fluvial Mitigation Measures

A sequential approach to the development layout has been taken and it is proposed that sensitive equipment (such as sub-stations and battery storage) will be located outside of the design flood extent, ensuring they remain operational even in times of flood.

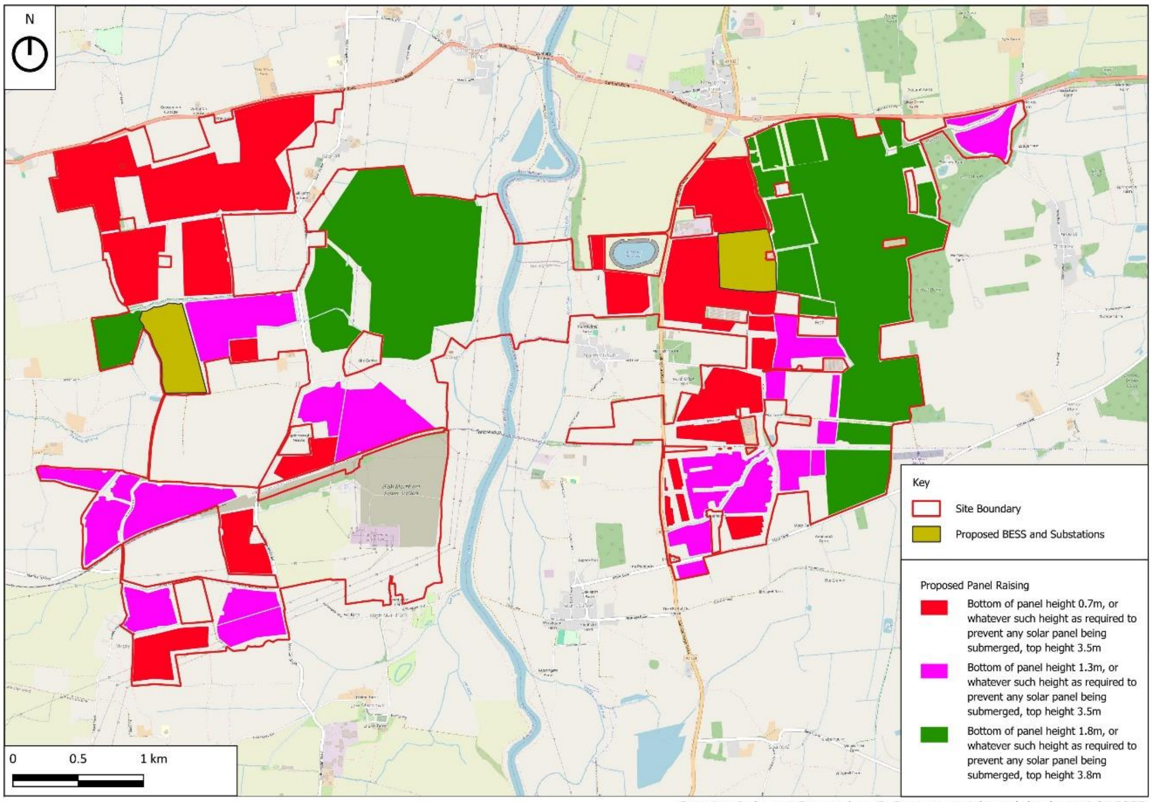
Due to the scale of the development, there is a need to incorporate more frequent inverters and as a result of this, there are locations where these will need to be within the design flood extent. It is proposed that these inverters will be raised above the design flood level with a freeboard of 300mm to ensure protection.

Given the outline nature of the application, the exact location of inverters within the flood extent is not confirmed, however, a number of them are likely to be required well within the design flood extents (i.e. not close to the edge of the floodplain). In these locations, raised platforms via ground raising is not considered to be feasible as based on topography it will likely be difficult to provide level for level compensation within their vicinity. With this in mind, at this stage and as a worst case, it is suggested that the inverters be raised on voided structures, that allow the flow and storage of floodwater beneath, thereby having a negligible impact on flood flows and storage capacity.

Based on initial structural assessments, it is anticipated that clear spans of 2.4m along the width of the inverter and 6m along its length can be provided between columns. These are considered to be significant spans which should allow the free flow of water with limited risk of blockages, whilst also allowing for maintenance and clean up operations following a flood event. However, once the inverter locations are known at detailed design, options for land raising rather than voided structures will be reviewed and provided where feasible. This is an item that will be confirmed at detailed design and assessed as part of Flood Risk Mitigation Requirement 22 (as set out in Section 1.5 of this report). This confirmation / review of the design is also allowed for within the relevant outline design parameters for the inverters. This principle has been discussed and agreed with the EA.

With regards to the solar arrays, following discussions with the EA (**Appendix A3**), they stated that ideally, panels would be raised above the design flood levels, with 300mm freeboard provided to the base of the panel itself. It is proposed that this be achieved across the majority of the Site by raising the bottom of panel heights (i.e. the height between the ground and base of the panel) in line with **Figure 3-10** below.

Figure 3-10: Summary of Bottom of Panel Height Parameters



Contains Ordnance Survey data © Crown copyright and database right 2025

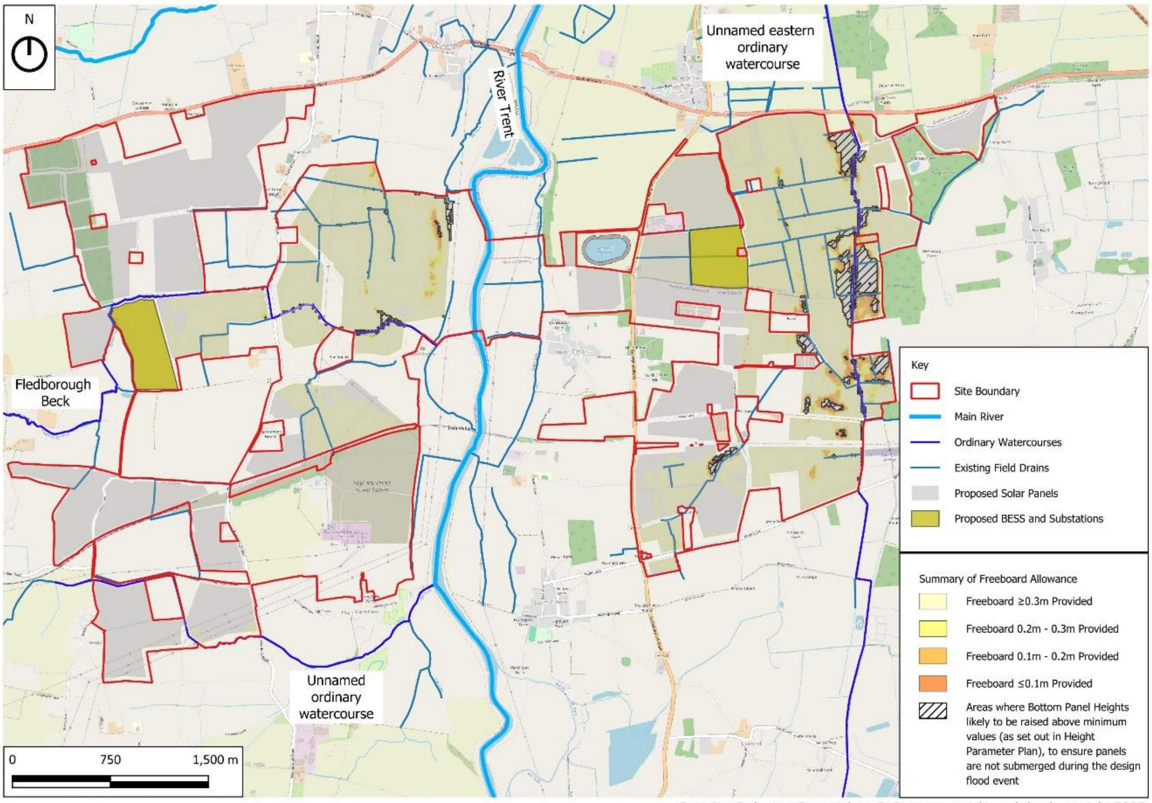
As noted within **Figure 3-10**, although minimum bottom panel heights are stated, the base of the panels will be raised as required to ensure that the panels will not become submerged. This change in bottom panel height will be achieved by adjusting the panel angle (within the 10 – 25 degree as set out within the outline design parameters) or by removing the bottom row of panels. The maximum top of panel heights (as secured by the outline design parameters) will not be exceeded in taking this approach.

By taking the above approach, it is confirmed that during the design flood event, the panels will not be submerged at any location within the Proposed Development, thereby ensuring the panels themselves will not impact flood flows or storage capacity.

Figure 3-11 below provides a summary of freeboard provided in the design flood event and illustrates that a minimum of 300mm freeboard has been provided across the majority of the Site. There are however, some localised positions where this is not possible and the freeboard achieved is illustrated in Figure 3-11. The principle of localised reductions in freeboard has been discussed and agreed with the EA (**Appendix A3**).

Figure 3-11 also highlights locations where the bottom of panel height will likely need to be raised beyond the minimum values set out, to ensure they are not submerged. Given the outline nature of the Proposed Development at this stage and the variation in flood depth in these locations, it is not possible to confirm the exact bottom of panel height that panels in these areas will be raised to. This is an item that will be confirmed at detailed design and assessed as part of Flood Risk Mitigation Requirement 22 (as set out in Section 1.5 of this report), to ensure the design does not impact flood flows or storage capacity to a greater extent than concluded in this FRA. The outline design parameters and Requirement 5 (detailed design approval) also require that the details of the scheme must comply with the detail approved under Requirement 22. This principle has been discussed and agreed with the EA.

Figure 3-11: Summary of Freeboard Allowance for the Design Fluvial Event



Although the Tidal Trent modelling does incorporate some of the existing ordinary watercourses (i.e. such as the Fledborough Beck) as gully lines, their full extent is not included and the fluvial impact on the ordinary watercourses is therefore not fully represented in the modelling. In the absence of this, it is proposed that where flooding from the River Trent may not be the dominant source, the low risk pluvial flood event (1 in 1,000 year probability) will be used as a proxy for the design fluvial event (see Section 3.2 for more information).

It is worth noting that the analysis set out below and agreements with the EA were completed and reached prior to the release of the most recent 2025 Risk of Flooding from Surface Water dataset. The 2025 dataset however, is largely shown to present a betterment in terms pluvial flood risk (i.e. flood extents are generally less severe), and to be conservative, we have therefore continued to use the 2024 dataset as a proxy for fluvial flooding. With regards to surface water flooding, both the 2024 and 2025 datasets have been considered in this assessment (See Section 3.2).

Through discussions with the EA (**Appendix A3**), it was agreed that flooding to the west is dominated by the River Trent but that consideration of the low-risk pluvial event should be made for the Fledborough Beck and Unnamed Ordinary Watercourse in the south west. As part of this, the EA requested that an assessment of flows within the catchment for the pluvial and fluvial events be undertaken to confirm there is a correlation between the two events. This provides confidence that the low risk pluvial event is a sensible dataset to use.

In order to do this, FEH Catchment descriptors were obtained for the Fledborough Beck and Unnamed Watercourse and an ReFH2 assessment undertaken for the 1 in 100 year plus 39% climate change event.

The ReFH2 model comprises a rainfall - runoff method for estimating flood hydrographs of a specified frequency. Rainfall is simulated using a depth-duration-frequency (DDF) model in conjunction with initial conditions and model parameters that are derived from the FEH catchment descriptors. The ReFH2 software includes runoff calculation methodology for both urban and rural catchments.

In this instance the FEH22 rainfall model was used, as this comprises the latest FEH statistical model for rainfall DDF estimation, superseding the FEH13 model and the legacy FEH99 model. Due to the rural nature of the Fledborough Beck and Unnamed Watercourse catchments, the ReFH2 rural catchment model was utilised.

FEH catchment descriptors for the Fledborough Beck and the Unnamed Watercourse were not modified from default values. The ReFH2 recommended design storm duration was used for each catchment, in order to produce the largest theoretical flood volume for the storm event.

The ReFH2 software allows simulation of both winter and summer seasonal rain storms. In accordance with EA guidance on flood estimation for small catchments[13], the winter storm season was utilised as this features a higher initial depth of water within a catchment, and thus a theoretically higher runoff volume and peak flow is produced.

Peak fluvial flows for each catchment was estimated using the 'Total Flow' output from the ReFH2 model. Surface water runoff rates for each catchment were derived from the 'Direct Runoff' value calculated as part of the ReFH2 calculation process.

The results of this assessment are provided in **Appendix A4** and have been summarised in **Table 3-1** below, and confirm that the two events correlate fairly closely and that the 1 in 1,000 year pluvial flows are slightly more conservative.

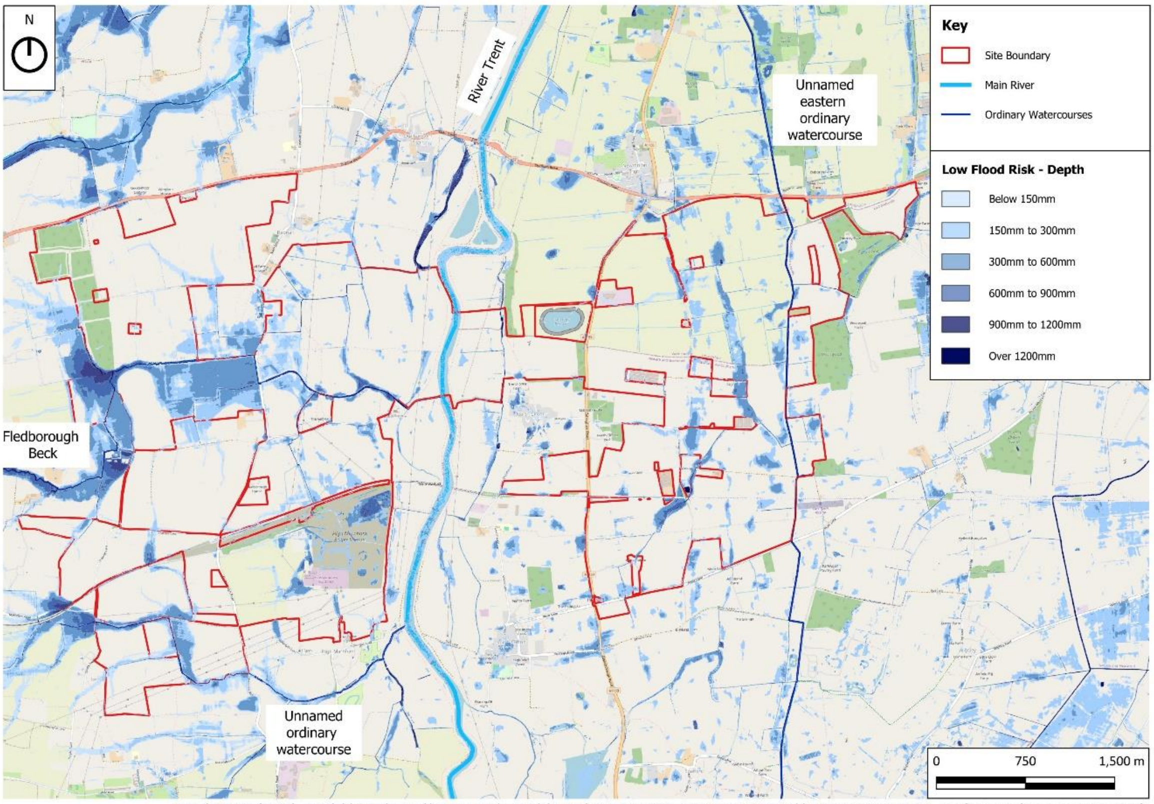
Table 3-1: Summary of ReFH2 Flow Comparison Assessment

	Fluvial 1 in 100 Year Plus 39% Climate Change – Max Total Flow (m3/s)	Pluvial 1 in 1,000 Year – Direct Runoff (m^3/s)	Percentage Difference
Fledborough Beck	6.54	6.87	4.8%
Unnamed Ordinary Watercourse (South West, near Marnham)	4.70	5.07	7.3%

It is therefore concluded that the low risk pluvial flood depths can be used as a proxy for the design fluvial flood depths, and panels will therefore be raised accordingly above the pluvial depth as shown in **Figure 3-12**. This has been agreed with the EA.

[13] Gov.uk [November 2024], *Flood Estimation Guidelines [online]*. Available from: https://www.gov.uk/government/publications/flood-estimation-guidelines (Accessed 6th November 2024)

Figure 3-12: Low Risk Pluvial Flood Depths (2024 dataset) (used as a proxy for design flood event associated with ordinary watercourses)



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

The raising of the panels will be achieved through the use of slender frames meaning that the potential for debris blockages is kept to a minimum, and even if there were to be some minor obstruction, flood water would continue to flow. Furthermore, the panels frames will be designed to withstand debris impact as required. Within the Site's operation and management strategies, details for maintenance actions to be taken at regular intervals and following a flood event will be outlined. This will be confirmed at detailed design however, it Is anticipated that this will include the following:

- Clearance of any debris collected on fences, paths, roads and between panel supports.
- Inspection of panel supports and fences to ensure structural integrity. Should any issues be observed, then remediation measures or replacement will be implemented as necessary.

Flood Volume Assessment

Following discussions with the EA, although not considered to be a significant concern, a conservative assessment of the potential volume loss associated with the panel mounting structures, partially submerged panels and inverter voided structures was undertaken, to understand the potential impact on the wider floodplain and its associated flood storage volume.

To support the flood storage assessment, a structural assessment to determine a typical design of the panel mounting structures and inverter voided structures (within the design flood extent) has been undertaken. This assessment takes in to account the likely velocity of flood flows and potential debris impact and has been used in assessing flood storage capacity. In order to assess a worst case scenario on flood storage impacts, conservative assumptions with regards to flood depth, velocity and potential debris impact were applied. At detailed design however, area specific conditions and likelihood of debris impact will be considered so that efficient sizing of structural features can be undertaken.

For clarity, the flood volume assessment has been split to assess the impacts to the west and east of the River Trent. The assumptions/principles and assessment of flood storage for the separate elements are set out under the following headings.

Panel Mounting Structures

In assessing the potential impacts on flood storage capacity due to the panel mounting structures, the following principles and assumptions were applied:

- Column and beam sizes are 250mm x 250mm Square Sections as indicated by the structural assessments undertaken.
- Depth of flooding to columns has been taken as 1.8m (i.e. to the base of the panels and underside of the beams), across all panel mounting structures within the design flood extent. Although there would be some increase in this flood depth for areas where the bottom of panel height will likely need to be raised beyond the minimum values, there are also significant areas where the flood depth is less than 1.8m. This flood depth is therefore considered to be a reasonable and conservative value.
- The total number of solar tables estimated to be within the design flood extent is as set out in **Table 3-2**.
- The total number of solar tables where it is estimated that structural beams could be submerged is set out in **Table 3-3**.
- Where structural beams are anticipated to be submerged (i.e. where flood depths exceed 1.8m), the total length and beam dimensions for the solar panel tables (set out in **Table 3-4**) have been used.

Table 3-2: Anticipated Number of Table Types within Design Flood Event

Table Type	Number of Tables West of the River Trent	Number of Tables East of the River Trent
3 x 9	273	591
3 x 18	259	504
3 x 27	3,822	5,718

Table 3-3: Anticipated Number of Tables where Beams could be Submerged

Table Type	Number of Tables West of the River Trent	Number of Tables East of the River Trent
3 x 9	6	43
3 x 18	5	62
3 x 27	83	641

Table 3-4: Solar Table Total Beam Dimensions and Column Details

Table Type	Number of Columns	Total Beam Length of Array per Table*	Total Beam Width of Array per Table**
3 x 9	6	23.4	9.6
3 x 18	8	46.8	12.8
3 x 27	12	70.2	19.2

*Total beam length for each table type utilises typical table lengths of 11.7m, 23.4m and 35.1m and multiplies by 2.

** Total beam width for each table type utilises typical table width of 3.2m multiplied by the number of beams. For clarity, typical number of beams for each table type are 3, 4 and 6, based on the number of columns.

The total anticipated loss in flood storage in the design flood extent due to the columns is summarised in **Table 3-5** below.

Table 3-5: Flood Volume Loss Due to Panel Mounting Columns

Table Type	Flood Volume Loss - West of the River Trent (m^3)	Flood Volume Loss - East of the River Trent (m^3)
3 x 9	184	399
3 x 18	233	454
3 x 27	5,160	7,719
Total	5,577	8,572

The total anticipated loss in flood storage in the design flood extent due to the panel mounting beams is summarised in **Table 3-6** below.

Table 3-6: Flood Volume Loss Due to Panel Mounting Beams

Table Type	Flood Volume Loss - West of the River Trent (m^3)	Flood Volume Loss - East of the River Trent (m^3)
3 x 9	12	89
3 x 18	19	231
3 x 27	464	3,581
Total	495	3,901

Inverter Voided Structures

In assessing the potential impacts on flood storage capacity due to the inverter voided structures, the following principles and assumptions were applied:

- Column sizes are 250mm x 250mm Square Sections as indicated by the structural assessments undertaken.
- Any structural beams forming the inverter structure will be raised such that they are 300mm above the design flood level and will therefore not impact upon the design flood storage capacity.

- A maximum flood depth of 1.41m has been assessed for all inverter structures estimated to be within the design flood extent. In reality, this varies and depths are much less in other areas.
- There will be 6 columns per inverter structure.
- The total number of inverters estimated to be within the design flood extent is set out in **Table 3-7**.

Table 3-7: Estimated Number of Inverters Located within Design Flood Extent

West of the River Trent	East of the River Trent
19	42

The total anticipated loss in flood storage in the design flood extent due to the inverter columns is summarised in **Table 3-8** below.

Table 3-8: Flood Volume Loss Due to Panel Mounting Columns

Flood Volume Loss - West of the River Trent (m^3)	Flood Volume Loss - East of the River Trent (m^3)
10	22

Total Flood Volume Assessment

In assessing the total potential impacts on flood storage capacity due to panel mounting structures and voided inverter structures, the following principles and assumptions were applied:

- The total volume lost is obtained by summing the flood volume losses from **Table 3-5**, **Table 3-6**, and **Table 3-8**.
- The area of design flood extent within the Order limits has been used to determine the potential change in flood level. The reality however, is that the negligible change in flood level would actually spread further than the Order limits and would be less as a result.
- The flood level change is calculated by dividing the total volume lost by the area of design flood extent within the Order limits.

The total loss in flood storage in the design flood extent and the resulting impact on flood level change is summarised in **Table 3-9** below.

Table 3-9: Total Flood Storage Losses and Flood Level Change

	West of Trent	East of Trent
Total Flood Volume Lost (m^3)	6,082	12,495
Area of Design Flood Extent within Order Limits (m^2)	2,748,642	3,560,772
Flood Level Change within Order Limits (mm)	+ 2.2	+ 3.5

The flood level changes of 2.2mm on the west and 3.5mm in the east set out within **Table 3-10** above are within the 5mm tolerance that the EA indicated would be acceptable. The impact on fluvial flood risk is therefore considered to be negligible.

The flood volume assessment is an item that will be reviewed and reassessed at detailed design as part of Flood Risk Mitigation Requirement 22 (set out in Section 1.5 of this report), to ensure the Proposed Development does not impact storage capacity to a greater extent than the 5mm tolerance set out by the EA. It is worth noting that the assessments discussed above are considered conservative due to the following assumptions applied:

- The structural details for the panel mounting structures (i.e. columns and beams) consider conservative assumptions with regards to flood depth, velocity and potential debris impact. At detailed design, area specific conditions and likelihood of debris impact will be considered so that efficient sizing of structural features can be undertaken and it is unlikely that all structures would need to as robust as those assessed in the flood volume assessment (i.e. they would be more slender and take up less flood volume).
- Depth of flooding to columns has been taken as 1.8m (i.e. to the base of the panels and underside of the beams), across all panel mounting structures within the design flood extent. Although there would be some increase in this flood depth for areas where the bottom of panel height will likely need to be raised beyond the minimum values, there are also significant areas where the flood depth is less than 1.8m. This flood depth is therefore considered to be a reasonable and conservative value.
- A maximum flood depth of 1.41m has been assessed for all inverter columns estimated to be within the design flood extent. In reality, this varies and depths are much less in other areas (i.e. flood depth would be less at many columns and the loss of flood volume would therefore also be less).
- The area of design flood extent within the order limits has been used to determine the potential change in flood level. The reality however, is that the change in flood level would actually spread further than the order limits and would be less as a result.
- The flood level change has been calculated by dividing the total volume lost by the area of design flood extent within the order limits only. The reality is that the impact on levels would extend across a greater area than just the design flood area within the order limits (i.e. the total flood volume lost would be divided by a greater area, meaning the change in flood level would be less)

It is also proposed that existing ground levels within the floodplain will be maintained within the Site, ensuring there will be a negligible loss in floodplain storage as a result of the Proposed Development.

Hydraulic Modelling Assessment

In addition to the flood volume assessment undertaken, the EA requested that the Tidal Trent 2023 model be re-run with the proposed development (i.e. supporting structures) included to consider the impact on flood depths and flows. This has been carried out and the results demonstrate that the change in flood depth is within model tolerance. The hydraulic modelling assessment therefore supports the results of the assessment informing the EIA and this FRA.

The details of the proposed model build are set out within the Hydraulic Modelling Technical Note included within **Appendix A5,** however the changes to the model that were made to represent the proposed development were as follows:

- Apply a flow constriction layer which allows for a percentage blockage within the model cells, representing the potential blockage the supporting structures could cause. The calculated flow constriction percentage is 3.61% as set out in **Appendix A5**.

- Incorporate a storage reduction factor to account for the potential displacement of floodwater due to the structural supports.

Within the hydraulic modelling assessment a structural column size of 120mm x 70mm has been assumed for the panel mounting structures. It is acknowledged that this differs to the 250mm x 250mm column size used in the volume assessment. The justification for this is as follows:

- It is not intended that columns of 250mm x 250mm be utilised across the entire Site. Larger column sizes would only be included within areas where debris risk is highest and will be based on location specific information which will be assessed at detailed design. It is not considered appropriate to apply a larger column size to the entire area as this would misrepresent the realistic situation, and is not considered appropriate for a dynamic assessment such as hydraulic modelling.

- Should detailed design indicate that larger columns would be required in certain locations, it is unlikely that square column sections would be provided, instead an open section (such as a C section) would be chosen. When compared to the 120mm x 70mm column assessed, these open columns have a smaller solid cross sectional area, and would therefore displace less floodwater. A conservative approach has therefore been taken at this stage.

- Should larger columns be required in local areas, the column spacing would increase beyond that set out for the 120mm x 70mm column. This means that the flow constriction percentage would likely be similar to that currently modelled. Furthermore, as set out previously, the larger columns would only be proposed in certain locations.

Refer to **Appendix A5** for further detail regarding the values used for the flow constriction layer and storage reduction factor, to ensure that robust assumptions have been applied at this stage.

<u>Baseline Model</u>

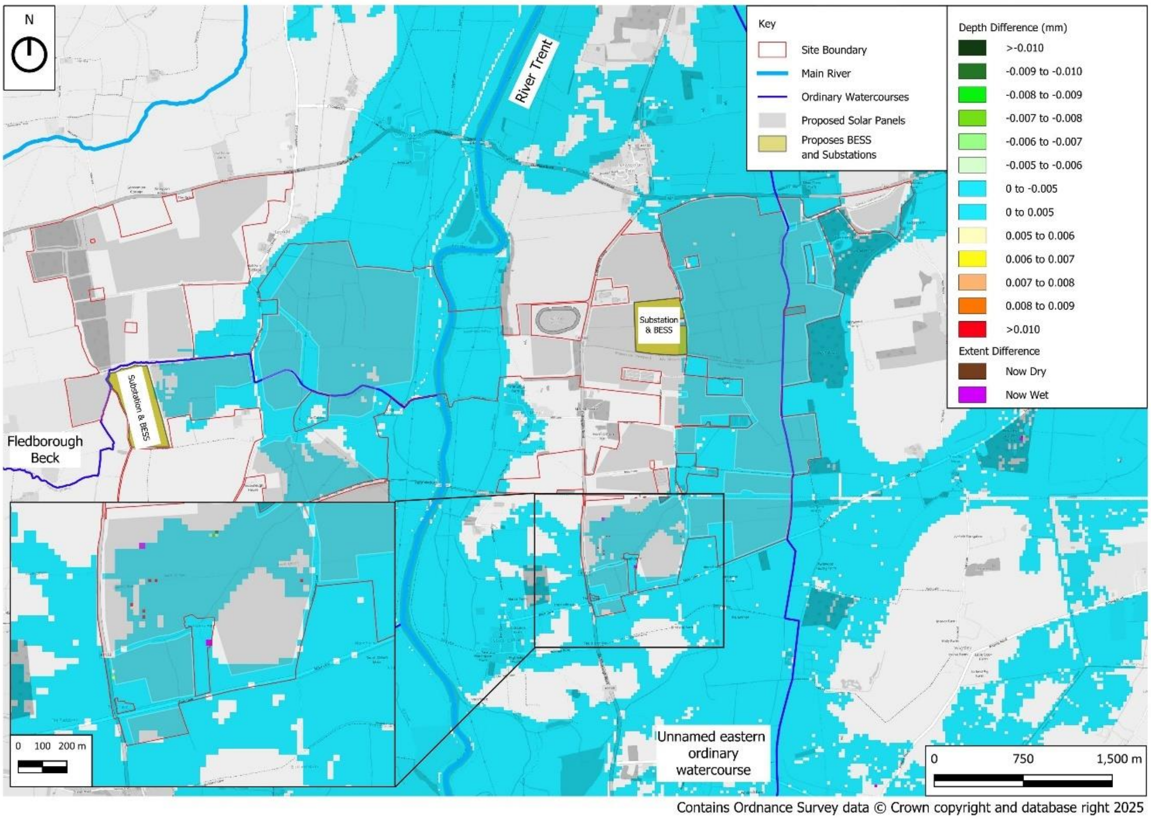
The existing EA Tidal Trent (2023) hydraulic model was re-run within a slightly later version of modelling software to confirm compatibility, yet ensure that the model as originally constructed still functioned appropriately. The depth and extent comparison map (refer to Figure 3 within Appendix A5) identifies that there are two cells within the surrounding area (approximately 1.7km to the east and 2.2km to the south of the Order Limits) where cells became dry in the re-run baseline (i.e. these are wet in the existing EA model and are dry in the re-run baseline model). These cells are located in woodland and an agricultural land.

In the proposed model scenario, the two cells noted above are shown to become wet again (i.e. are shown to flood, refer to **Figure 3-15**). Given that these cells are shown to flood in the EA baseline model, it is concluded that there is no discernible change in flood risk within these areas. Furthermore, the observed flood depths in the proposed model do not increase when compared to the EA baseline, further highlighting no tangible change. These two cells (i.e. to the far east and south) are therefore not discussed further with regards to changes in flood extent or depth, as they are not considered to be impacted by the Proposed Development.

<u>Flood Depth Differences</u>

Based on the results of the baseline and proposed model scenarios, depth difference mapping has been prepared to illustrate where there have been changes in flood depth (be that an increase or decrease). **Figure 3-13** below indicates that where there is existing flooding outside of the Order Limits, changes in flood depth will be between 0mm and 5mm. These changes are within the 5mm modelling tolerance that the EA have confirmed as having a negligible impact on flood risk.

Figure 3-13: Depth Difference - Design Flood Depths (1 in 100 year plus 39% Climate Change)



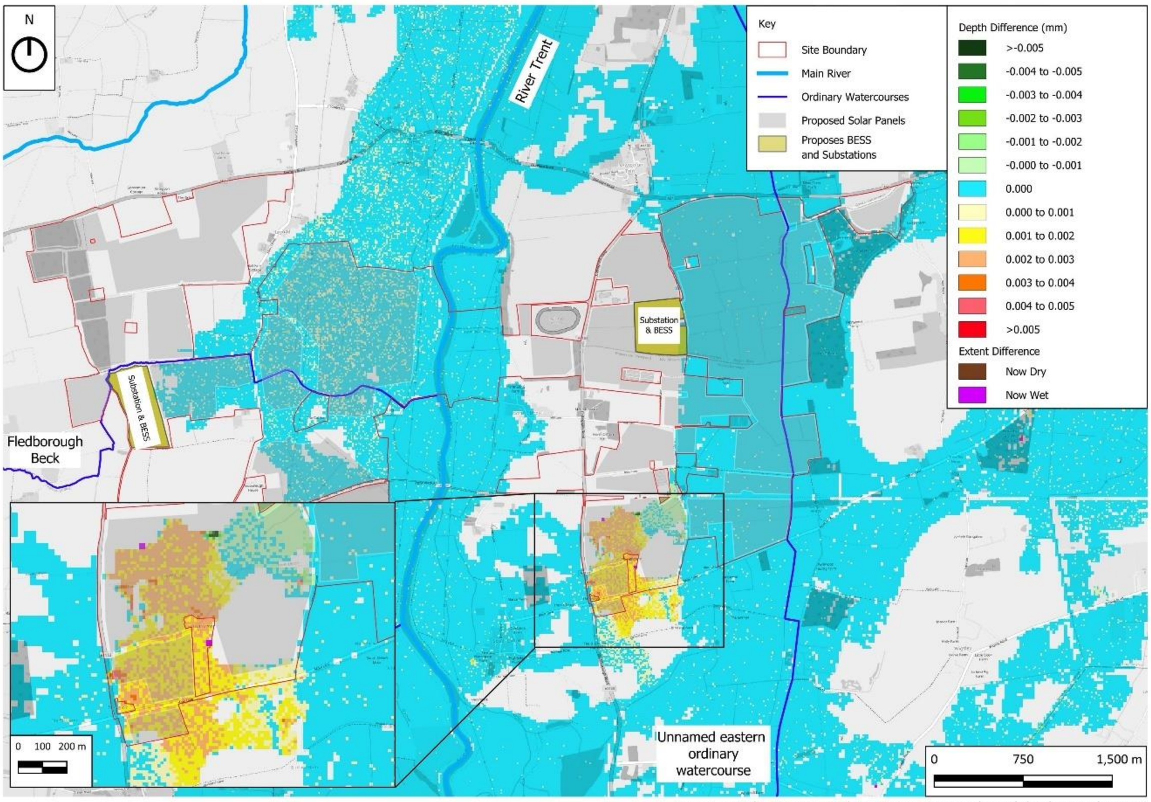
To provide further clarity, **Figure 3-14** illustrates the specific depth changes within the negligible 5mm tolerance. The EA have confirmed that any modelled change below 5mm is considered to be negligible and within accepted model tolerance, i.e. there is no perceived change in impact or risk. This is in line with general model expectations.

As can be seen in **Figure 3-14**, across the majority of the Site and surrounding areas (as indicated by the blue areas) there is no change in flood depth (i.e. 0mm change).

With the exception of some localised cells (within South Clifton, where flood levels are shown to increase by up to 1mm), there is no increase within the villages of North or South Clifton.

There is one area to the south where potential changes in flood depths are shown to be in the vicinity of 2mm – 3mm, with some very limited and localised cells which experience up to 5mm in change. For context, flood depths in the baseline scenario (i.e. without the Proposed Development) for this area are up to 1m in places but more generally are between 0.3m to 0.7m.

Figure 3-14: Detailed Depth Difference - Design Flood Depths (1 in 100 year plus 39% Climate Change)



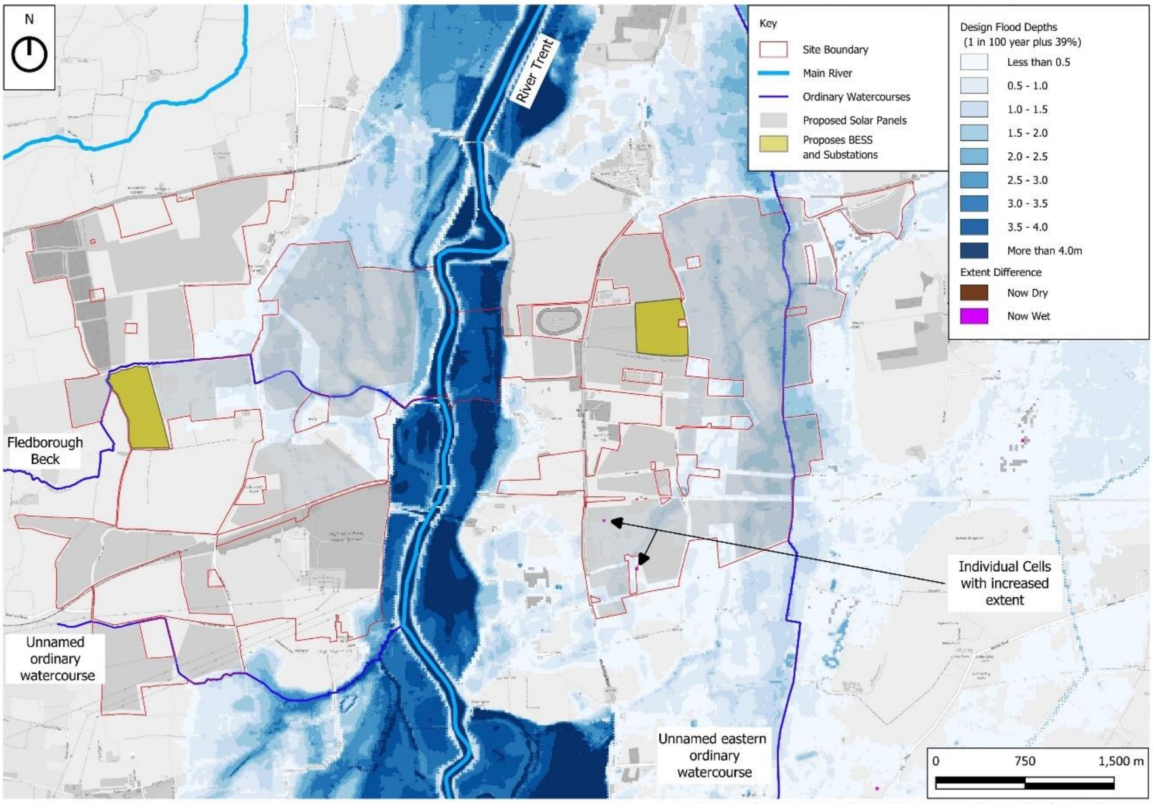
As a result it is considered that there is a negligible change or impact on flood risk as a result of flood depth.

<u>Flood Extent Differences</u>

There are two cells which could experience a minor extension in flood extent in comparison to both the EA baseline model and re-run baseline model (illustrated by the pink "now wet" cells and arrows in **Figure 3-15**). These are discussed below:

- A "now wet" cell is shown outside of the Order Limits and along an access track in the south. In the baseline scenario (both the EA baseline and rerun baseline), this access track and the residential property are shown to flood to the north and south of the "now wet" cell, and the impact of this minor additional extent would therefore not cause any additional risk. This additional extent would not restrict access/egress to the property, which is already flooded in the existing baseline situation.
- The remaining cell which is shown to be "now wet" is within the Order Limits and has been taken into account within the scheme design. This is not discussed further within this FRA.

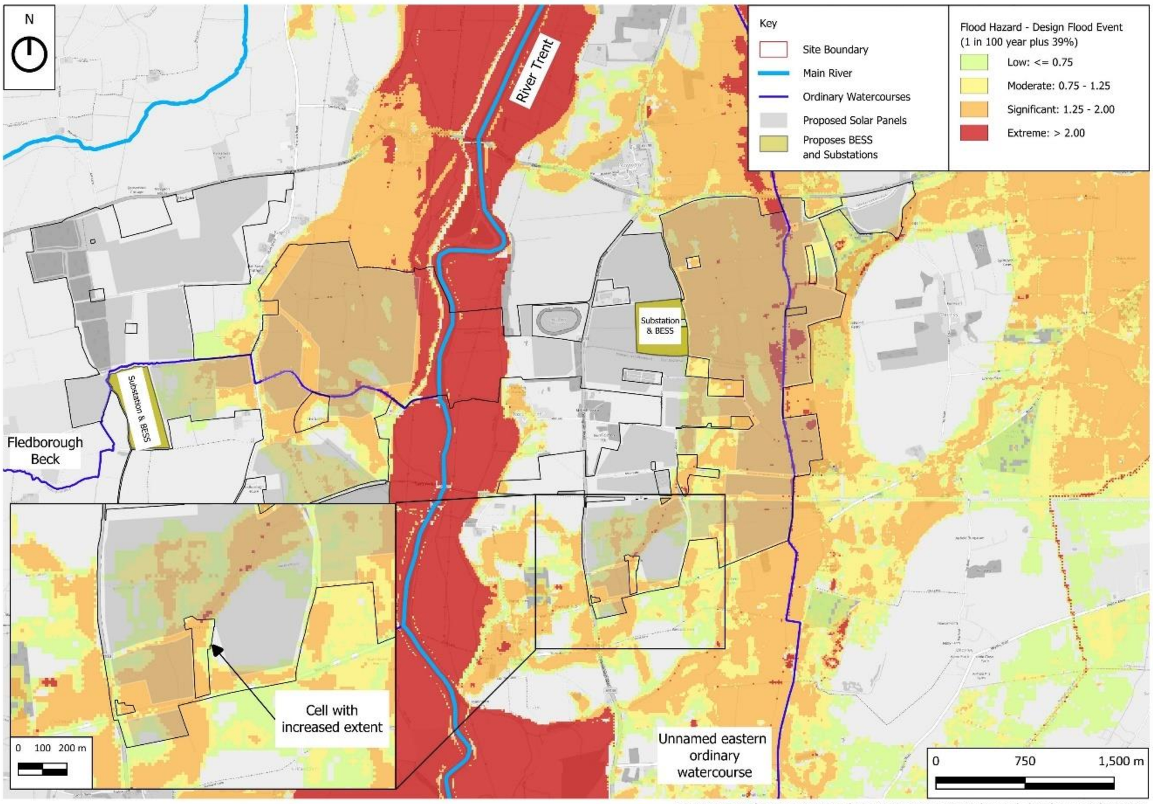
Figure 3-15: Proposed Scenario - Design Flood Depths (1 in 100 year plus 39% Climate Change)



It is important to note that the access track “now wet” cell is shown to flood due to an overtopping from an adjacent cell (which already floods in the baseline conditions). This minor increase in extent occurs due to a negligible increase in flood level within the adjacent cells that is within the 5mm model tolerance. The “now wet” cell is therefore a result of a negligible change in flood level which is within the limitations of the model. A discussion on the “now wet” cell has been included for transparency and to be conservative in the assessment, however the results do not represent a tangible increase in flood risk.

Based on the land use and existing surrounding flooding, any minor change in extent along the access track is not considered to cause additional effects. Flood hazard mapping (**Figure 3-16)** indicates that the hazard rating at the specific cell on the access track is shown to be moderate, however the access track (both north and south) as well as the property itself are shown to have a significant hazard rating (greater than medium). This small additional area would therefore not increase the hazard rating when travelling to or from the property within this area compared to the baseline situation.

Figure 3-16: Proposed Scenario - Design Flood Hazard Rating (1 in 100 year plus 39% Climate Change)



A comparison of the baseline and proposed hazard rating has been undertaken and confirms that there are only minor localised changes in hazard rating across the Site and in the vicinity. The areas where there are changes are either within the Order limits or within agricultural areas of land where there are no receptors to this change.

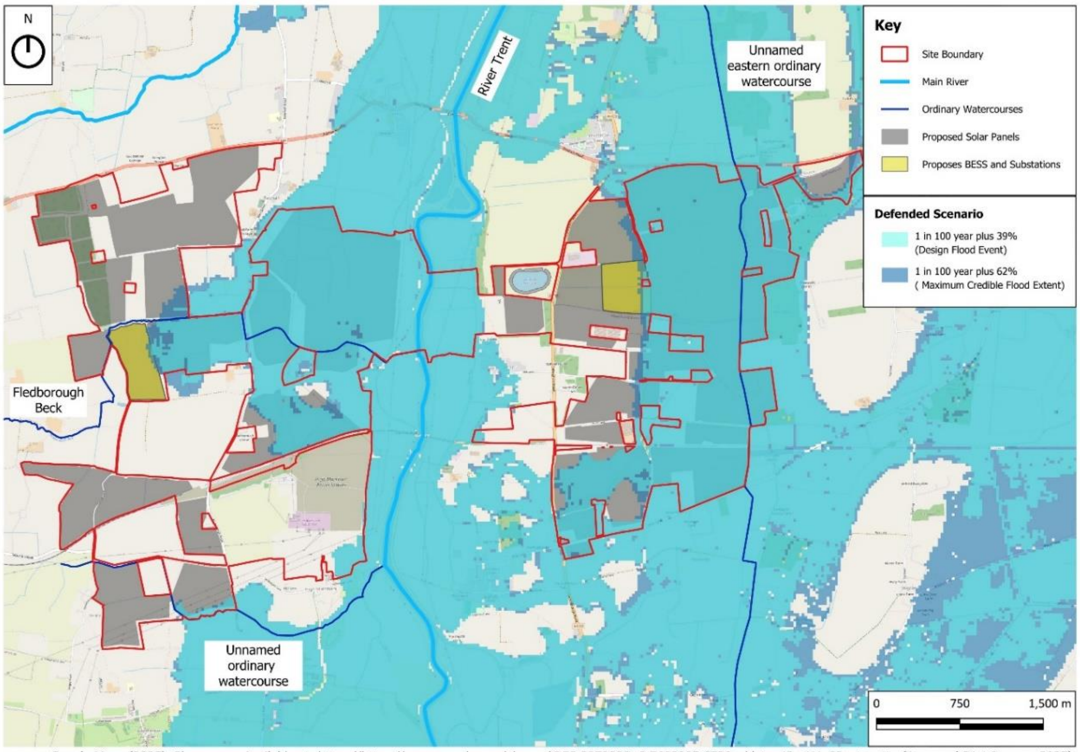
The hydraulic modelling quantifiably shows that through incorporating the potential loss in floodplain storage, alongside taking into account the potential for flow constriction, there would be a negligible increase in flood levels and flood extent outside of the Order Limits, which does not constitute an increase in flood risk. As a result, the Proposed Development is not considered to materially alter flood risk within the surrounding area. Any minor changes in flow are considered to be negligible and would not increase flood risk to any sensitive receptors.

Flood Risk Mitigation Requirement 22 requires that flood risk mitigation design proposed at detailed design will accord with the FRA, and will be approved in consultation with the EA.

Maximum Credible Scenario

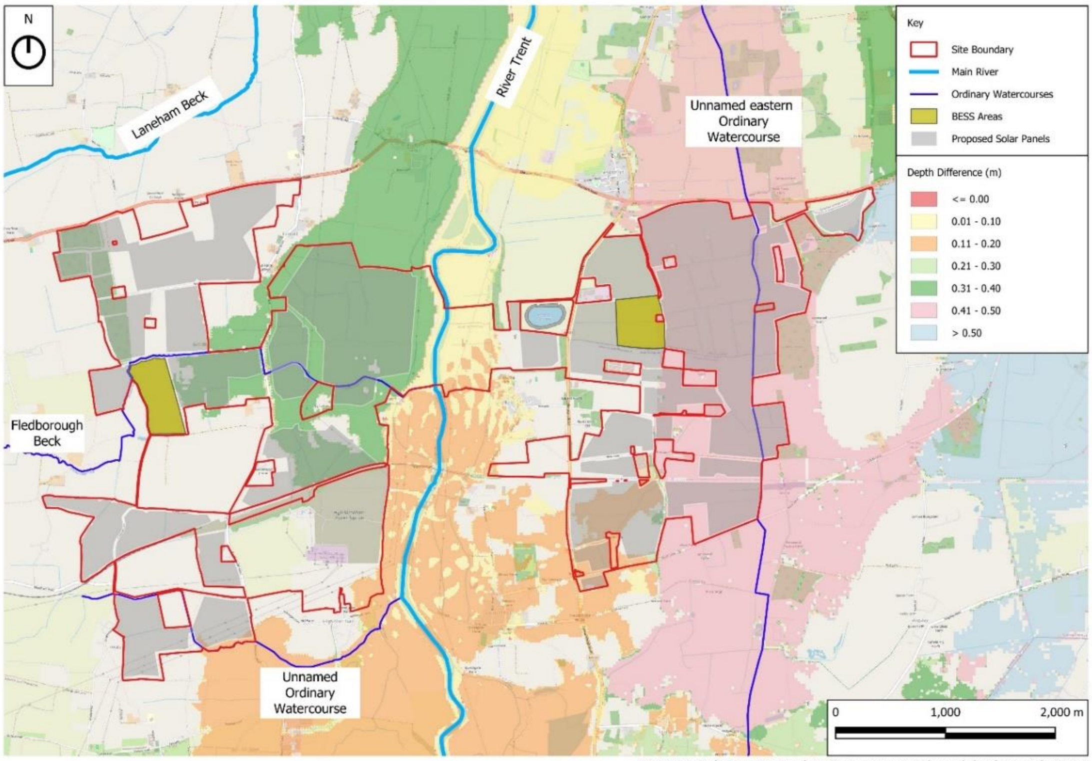
Following requests from the EA, the maximum credible scenario (i.e. 1 in 100 year plus 62% climate change event) has also been assessed as a sensitivity test, to consider how the proposals could be impacted in different future scenarios. A comparison of the extents in the design flood event and maximum credible scenario are provided in **Figure 3-17** below, as can be seen the differences in extent are not significant. A comparison of the flood depth during the design flood event and maximum credible scenario are also provided in **Figure 3.18**.

Figure 3-17: Comparison of Design and Maximum Credible Flood Extent



Google Maps (2025). Placename. Available at: https://https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

Figure 3-18: Comparison of Design and Maximum Credible Flood Depth

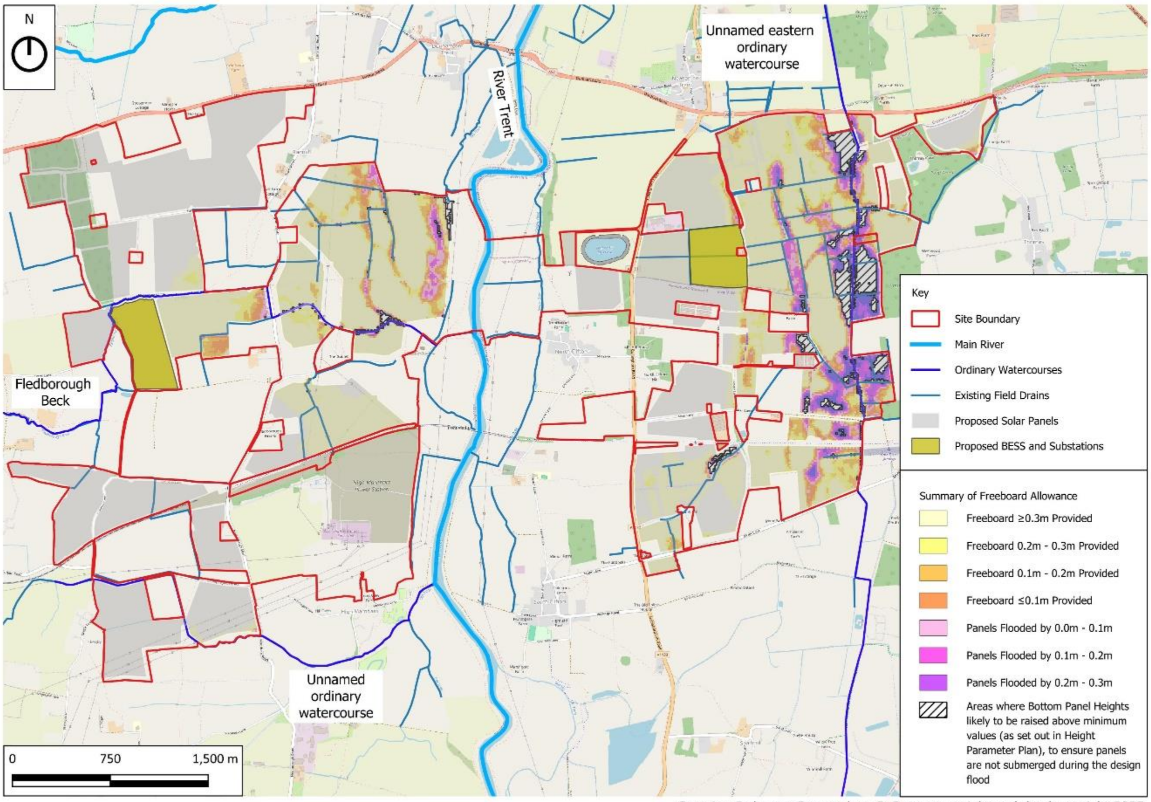


Contains Ordnance Survey data © Crown copyright and database right 2025

Furthermore, an assessment of the impact on freeboard allowances and flood depth to the panels has been undertaken for the maximum credible scenario, illustrated in **Figure 3-19** below. Although there are some increases in flooding of the panels, the majority of the panels would still achieve the 300mm freeboard as recommended by the EA.

This shows that the Proposed Development remains appropriate, has been designed accordingly, and is in line with the principles agreed with the EA in relation to this project.

Figure 3-19: Summary of Freeboard Allowance and Panel Flood Depths for Maximum Credible Scenario

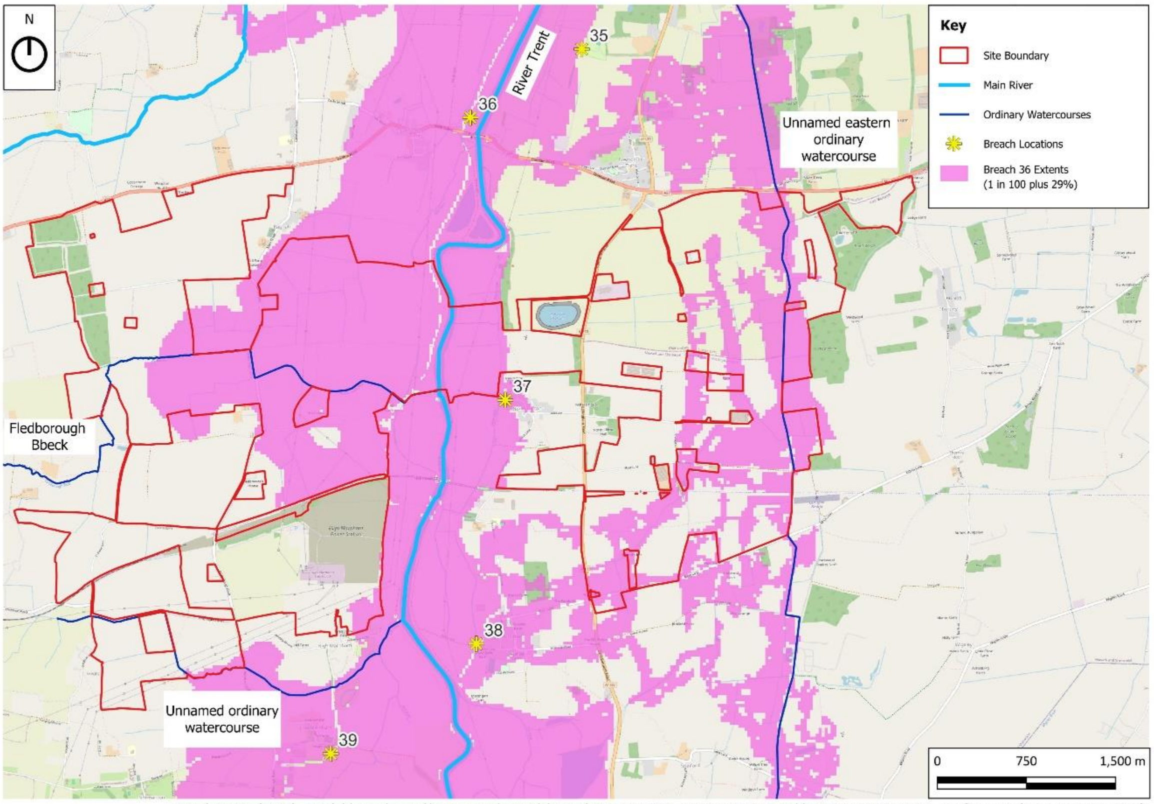


Contains Ordnance Survey data © Crown copyright and database right 2025

3.1.6 Residual Risk (Breach)

The impact during a residual event (i.e. should there be a breach in the flood defences at the same time as a high water level within the River Trent) has been considered through interrogating the breach data provided by the EA. Through consultation, the EA provided modelled outputs for a number of breach locations along the River Trent. Based on the extent of flooding, a breach at Location 36 (see **Figure 3-20** below) would result in the worst flood extent being experienced at the Site.

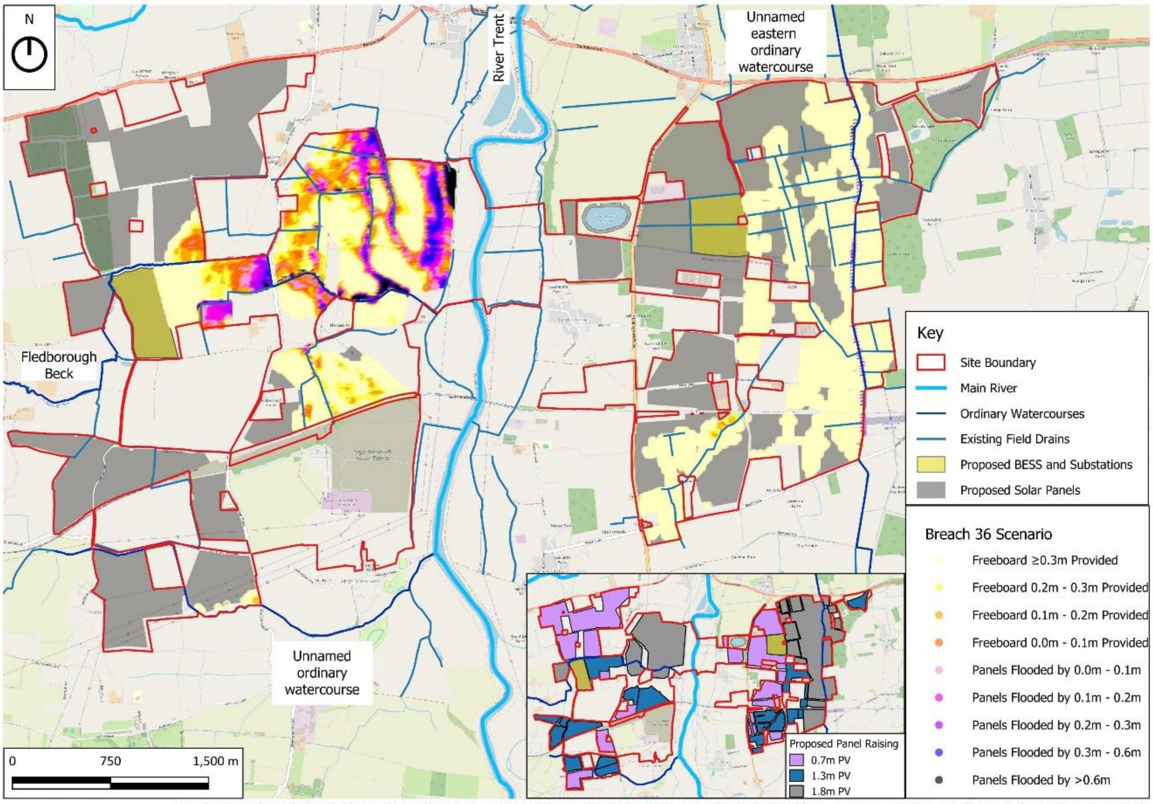
Figure 3-20: Flood Extent from Breach Location 36 (for the 1 in 100 year plus 29% climate change event)



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

An assessment of the impact on freeboard allowances and flood depth to the panels has been undertaken for this breach scenario, illustrated in **Figure 3-21** below. Although there are some increases in flooding to the panels, the majority of the panels would still achieve 300mm freeboard as suggested by the EA. It is noted that there are some increases in panels that would be flooded at the base, however on the basis that this is a residual event, this is considered acceptable and was agreed with the EA.

Figure 3-21: Summary of Freeboard Allowance and Panel Flood Depths for Breach 36



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

Following discussions with the EA, it was identified that as Breach Location 36 is located to the north (downstream) of the Site, there is a need to consider a further breach within the Site boundary. This is to ensure that the breach impact is not underestimated, and the Proposed Development is designed appropriately. During the meeting the EA agreed that this assessment did not need to be a full modelling exercise, and that the primary concern would be the potential impact to any sensitive infrastructure (such as the sub-stations and battery storage).

As agreed with the EA, assessment of the in-channel defended flood levels (for the 1 in 100 year plus 39% climate change scenario) and ground levels within the sub-station/battery storage areas has been undertaken, to understand the potential impact of a breach on the western and eastern banks of the Trent, within the Site boundary.

Breach on the Western Bank

An in-channel flood level of 8.70m AOD has been used as a conservative breach level for a potential breach on the western bank of the Trent, which is beyond the southern boundary of the Site. As shown in **Figures 3-22 and 3-23**, ground levels within the majority of the western sub-station/battery storage area are above the in-channel flood level and it is therefore anticipated that if there was a breach within the Site boundary, these areas would remain dry.

Although some areas of the western BESS plot would be located within the potential breach extent, all sensitive infrastructure will be set 300mm above the potential breach flood level to provide protection during the residual risk event, at a level of at least 9.00m AOD. To provide protection, it is likely that ground levels within this plot will be slightly amended (through a cut and fill analysis), however ground raising will only occur outside of the design fluvial flood extent and the 1 in 1,000 year pluvial flood extent (where associated with watercourses), to ensure that there will be no impact on existing fluvial flood risk or floodplain storage. This ensures that there is no requirement to provide floodplain compensation.

Figure 3-22: Defended In-Channel Flood Level and Ground Level Comparison

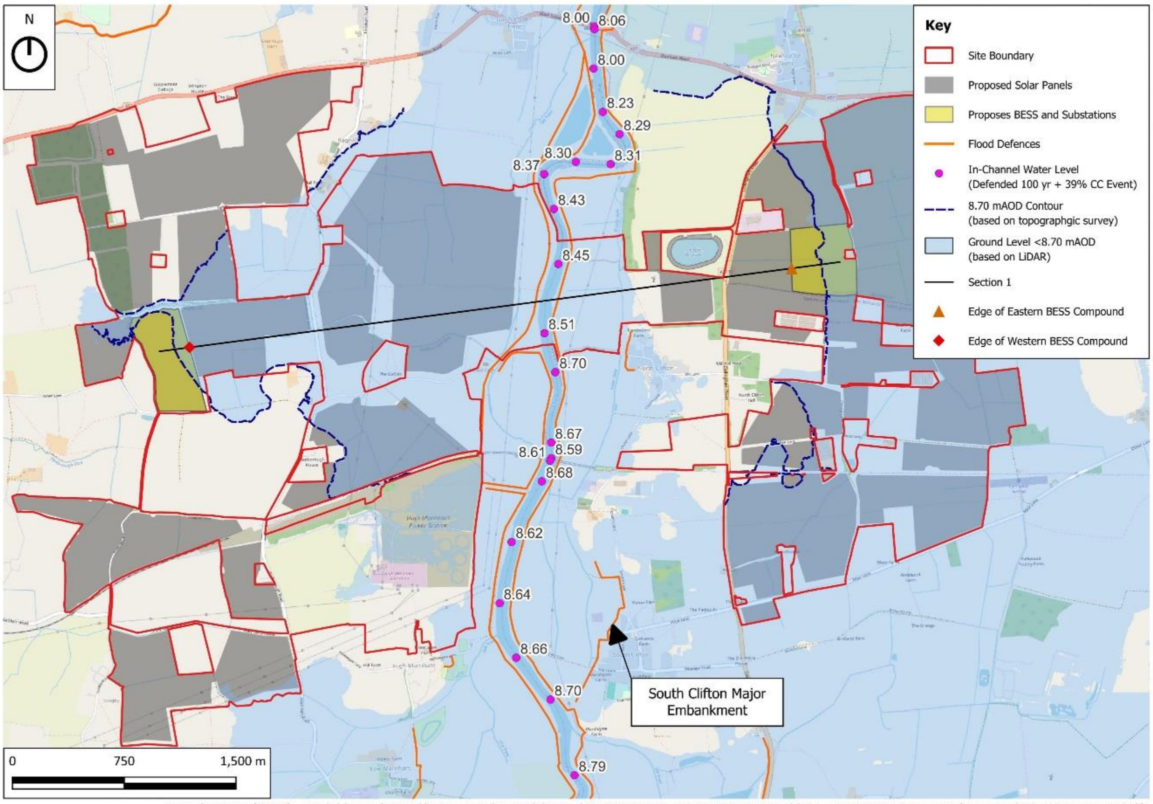
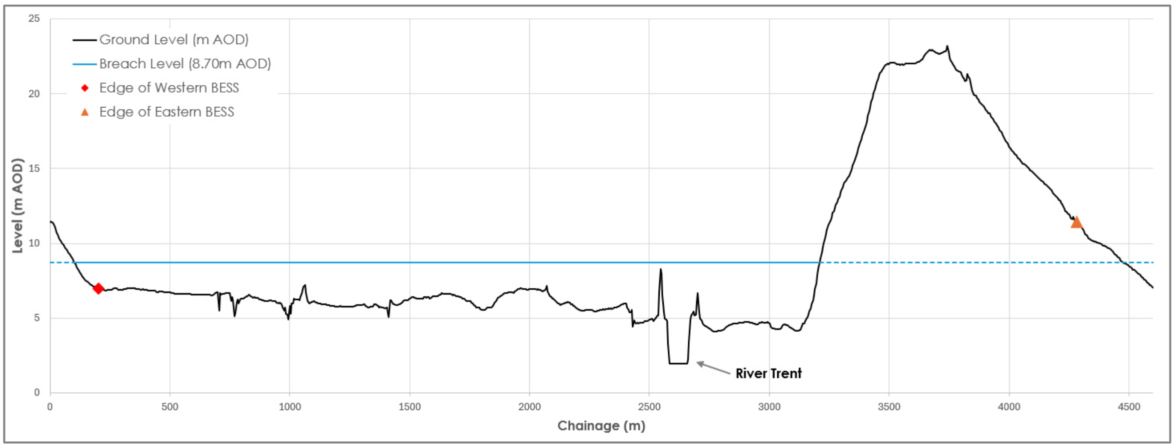


Figure 3-23: Defended In-Channel Flood Level and Ground Level Comparison – Section 1



Breach on the Eastern Bank

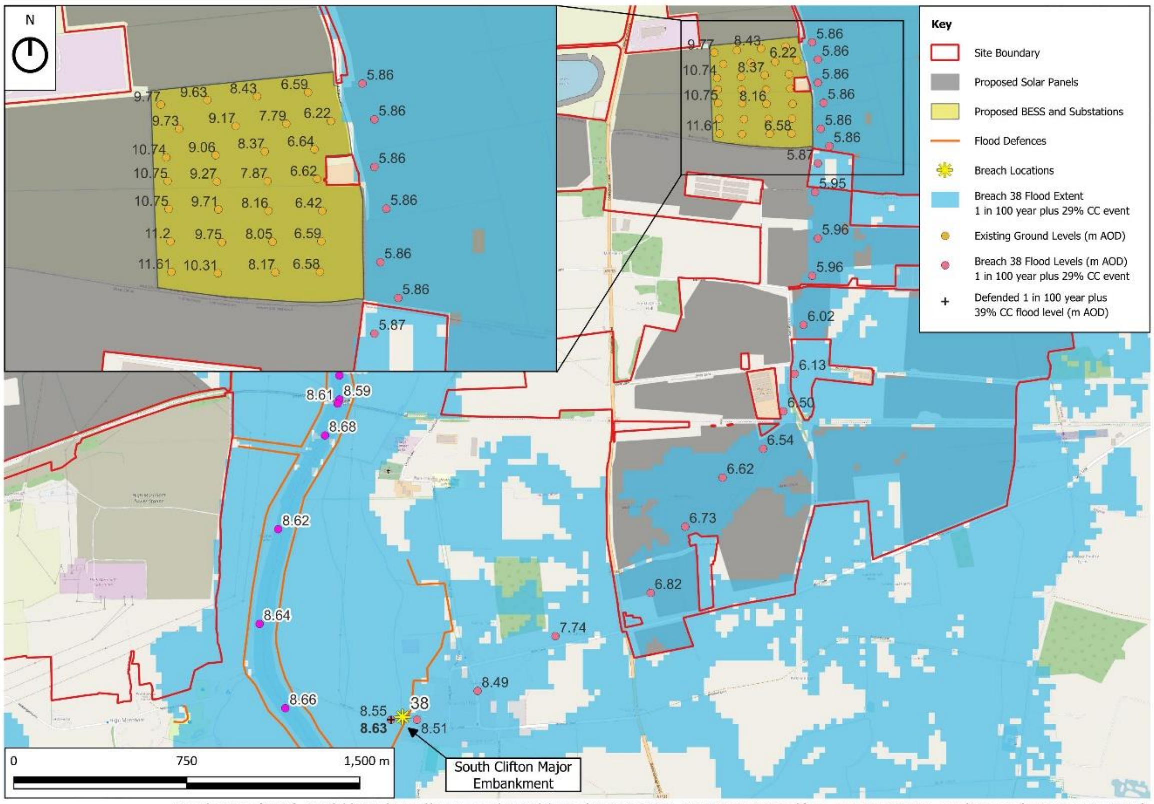
Most of the defence line to the east of the River Trent only provides a 1 in 5 year standard of protection (see **Figure 3-2**), and therefore consideration of a breach in the central area of the Site is not appropriate. In the south of the Site, the eastern BESS compound is protected by an area of high ground and the South Clifton Major Embankment (which has a 1 in 100 year standard of protection), as shown in **Figures 3-22 and 3-23** above.

As much of the high ground between the compound and the Trent is located above 8.7m AOD, and given the nature of the topography in this area of the Site, it is not considered appropriate or realistic to assess the impact of a potential breach on the eastern BESS compound using this flood level alone.

The potential breach risk associated with the eastern BESS therefore relates to the South Clifton Major Embankment. The EA have undertaken breach analysis associated with this defence (Breach 38), and therefore an assessment of the on-Site breach flood level and ground levels has been undertaken, to better understand the risk of breach, taking into account the latest current climate change requirements.

As indicated in **Figure 3-24** below, ground levels between the South Clifton Major Embankment and the eastern BESS compound slope from approximately 7.40m to 6.00m AOD. Consequently, the modelled breach levels are also shown to reduce towards the Site, with an adjacent flood level of 5.86m AOD.

Figure 3-24: Breach 38 Flood Level and Ground Level Comparison



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

The EA's current breach model includes 29% climate change, whereas the latest climate change requirement should consider 39%, as set out in Section 2.4. To be fully robust a comparison of the defended 1 in 100 year plus 39% climate change flood level (8.63m AOD) and the 1 in 100 year plus 29% climate change breach level (8.55m AOD) was therefore undertaken (as included in **Figure 3-20**). This approach has been agreed with the EA.

This indicates that the two flood levels are very similar, a difference of 0.08m. To ensure the assessment is robust, this potential increase in flood level has been applied to the maximum breach level adjacent to the Site during the 1 in 100 year plus 29% climate change breach event, to understand how the on-Site flood level may alter during the 1 in 100 year plus 39% climate change event. Given that the fall in ground levels between the breach location and the eastern BESS location is relatively consistent, this is considered to be an appropriate assessment.

A summary of this assessment is provided in **Table 3-10** below, which indicates that the lowest ground level within the proposed BESS compound is located 280mm above the anticipated breach level. The BESS infrastructure is proposed to be located 300mm above surrounding ground levels, and as a result will be positioned 580mm above the predicted breach level, ensuring protection.

Table 3-10: Eastern BESS Breach Level Analysis

100 year plus 29% climate change breach flood level (m AOD)	100 year plus 39% climate change defended flood level (m AOD)	Level difference (m)	Near-Site 100 year plus 29% climate change breach flood level (m AOD)	Predicted On-Site 100 year plus 39% climate change breach flood level (m AOD)	Minimum ground level within Eastern BESS area (m AOD)	Freeboard provided above indicative 100 year plus 39% climate change breach level (m)
8.55	8.63	0.08	5.86	5.94	6.22	0.28

3.2 Pluvial

Pluvial flooding occurs when natural and engineered systems lack capacity to manage the volume of rainfall. Pluvial flooding can occur during an extreme, high intensity rainfall event which overwhelms the local surface water drainage systems. This flood water will then be conveyed via overland flow routes based on the local topography.

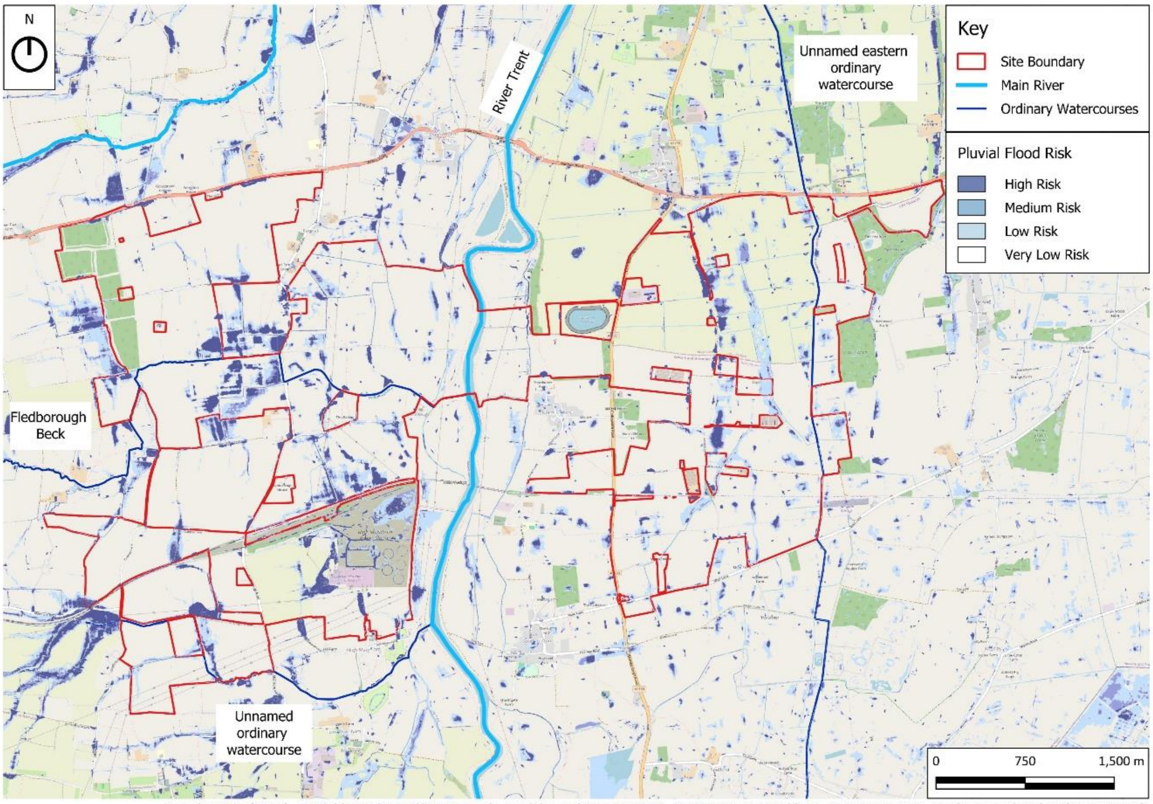
3.2.1 Overland Flow Routes

As outlined previously, the EA's released updated surface water flood mapping in February 2025, by which time much of the assessment of flood risk had already been undertaken. To be thorough however, both the 2025 mapping and previous surface water flood mapping (referred to as the 2024 dataset for ease) has been assessed under the following headings.

Risk of Flooding from Surface Water 2025 Dataset

The 2025 dataset identifies the majority of the Site to be a very low risk of flooding from pluvial sources. There are however some localised areas within the Site which are shown to be at low, medium and high risk (See **Figure 3-25**).

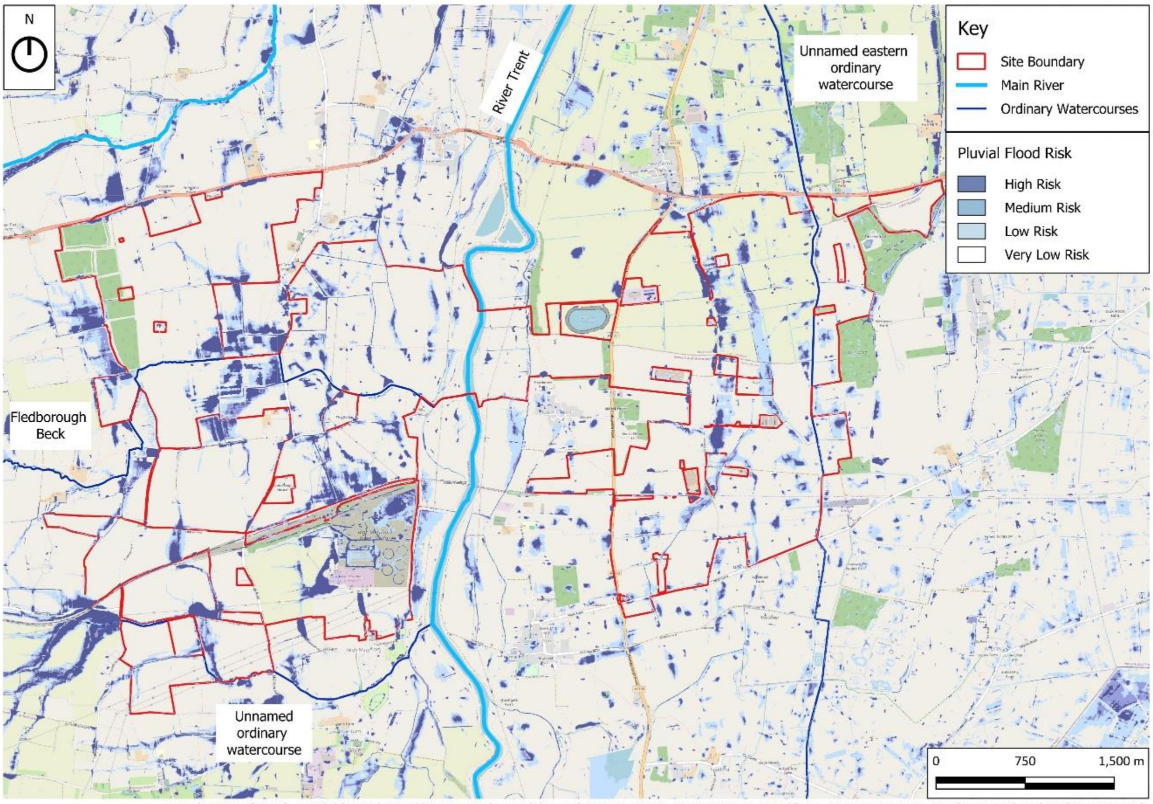
Figure 3-25: Environment Agency's Risk of Flooding from Surface Water – Present Day Extents (2025)



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 12th February 2025)

The latest EA Flood Risk from Surface Water dataset (2025) also includes allowances for climate change. Climate change mapping indicates a marginal increase in surface water flood extent and depth when compared to the present day (See **Figure 3-26**).

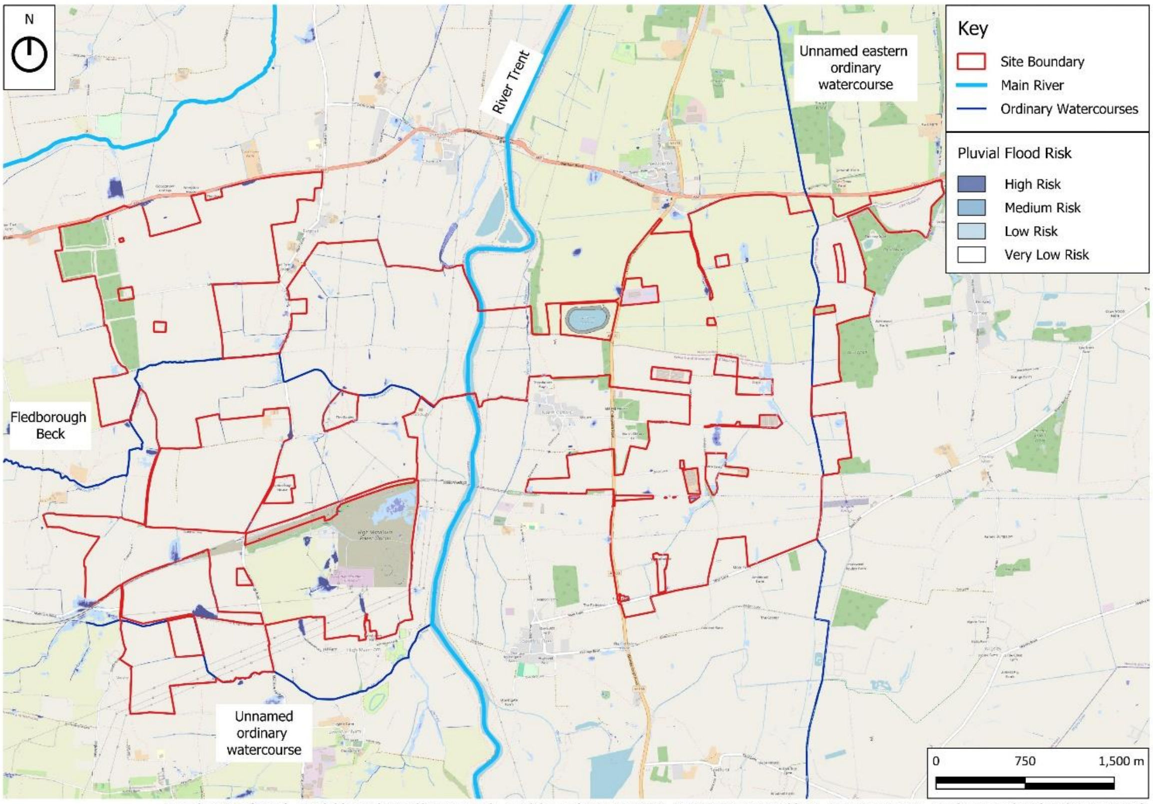
Figure 3-26: Environment Agency's Risk of Flooding from Surface Water – Climate Change Extents (2025)



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 12th February 2025)

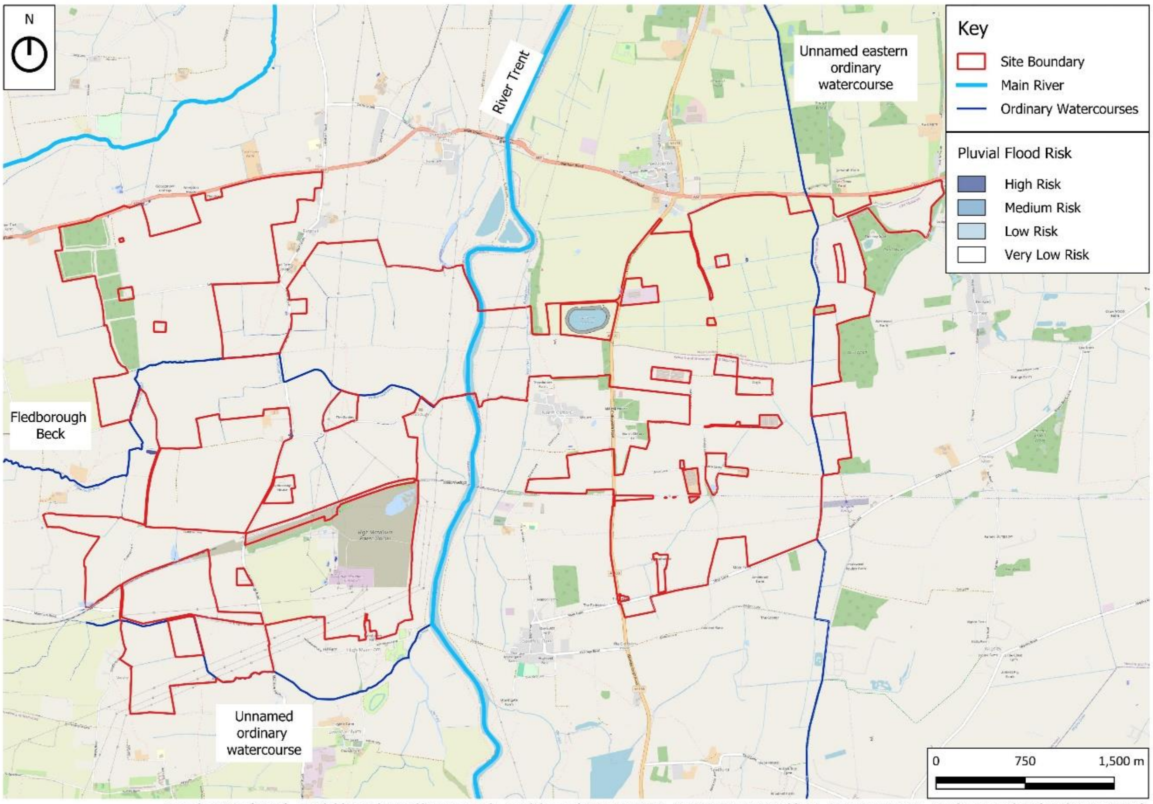
As shown in **Figures 3-27 and 3-28**, the latest depth mapping indicates that during the present day low risk scenario (i.e. between 1 in 100 and 1 in 1,000 year probability of occurrence) flood depths across the majority of the Order Limits is less than 300mm, with only localised areas where flood depths reach 600mm. Slightly larger areas would be impacted by the 300mm and 600mm depth bandings during the climate change scenario, however this is not deemed significant and does not change the approach with regards to mitigation.

Figure 3-27: EA's Risk of Flooding from Surface Water – Present Day 300mm Depth Mapping (2025)



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 12th February 2025)

Figure 3-28: EA's Risk of Flooding from Surface Water – Present Day 600mm Depth Mapping (2025)

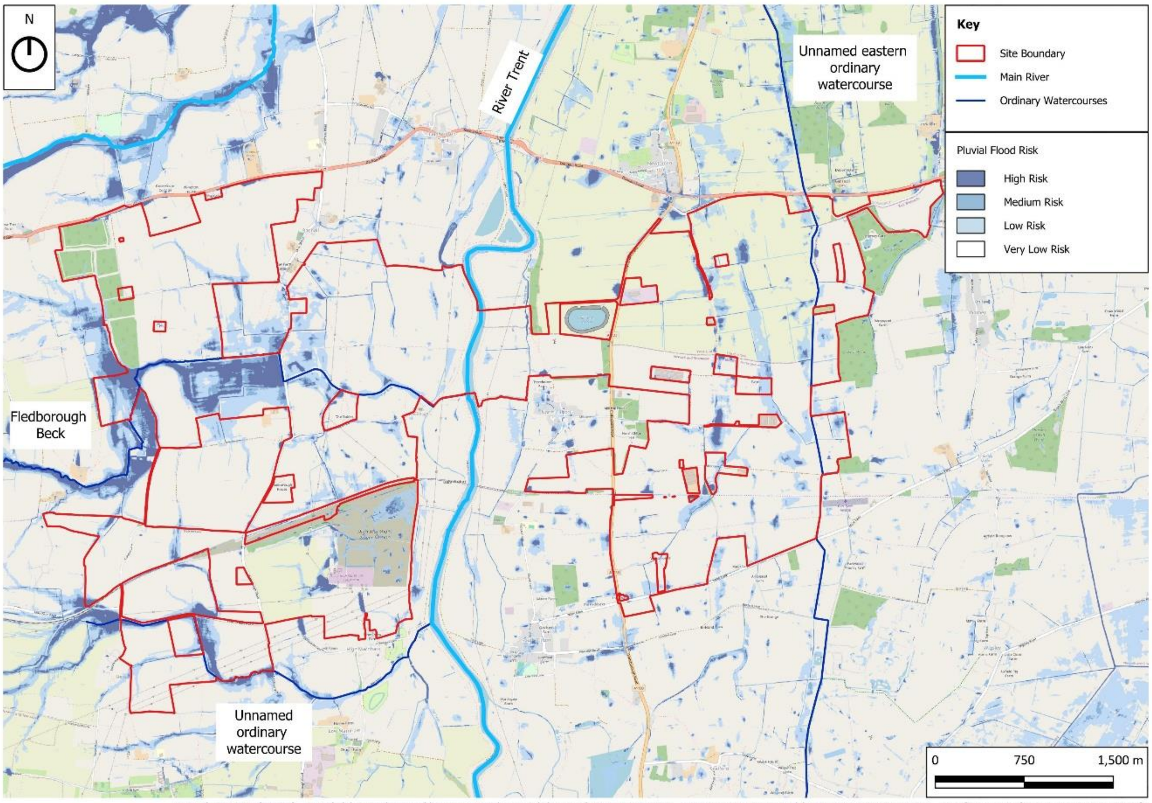


Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 12th February 2025)

Risk of Flooding from Surface Water 2024 Dataset

The 2024 dataset presents a slightly higher risk of surface water flooding at the Order Limits, in particular more flooding is shown to be largely associated with the Fledborough Beck to the west and unnamed ordinary watercourse in the southwest and east of the Site (**Figure 3-29**).

Figure 3-29: Environment Agency's Risk of Flooding from Surface Water Map (2024)



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

Review of the low risk scenario (i.e. between 1 in 100 and 1 in 1,000 year probability of occurrence) indicates that flood depths within the Site are generally less than 300mm. There are, however, topographically lower areas, predominantly associated with the existing ordinary watercourses and the natural topography of the Site where flood depths up to 1,200mm could be experienced **(Figure 3-12).**

Pluvial Embedded Mitigation

As with the fluvial mitigation, sensitive equipment is to be located away from the low risk flood extents.

With regards to panel and inverter raising, the mitigation measures set out within the fluvial section will also provide protection from pluvial flooding. As set out previously, the 2024 low risk surface water flood depths (see **Figure 3-12**) have been considered in the west (associated with the ordinary watercourses) as a proxy for the design fluvial flood depths and panels / inverters in these locations have been raised above the low risk depths accordingly. This has been discussed and agreed with the EA.

3.3 Sewers

Given the predominantly greenfield nature of the Site, it is anticipated there will be limited to no formal sewers or surface water drainage networks in place. The risk of flooding from sewers is therefore considered to be low.

3.4 Groundwater

Groundwater flooding occurs when water emerges from the ground due to a high water table, normally following heavy rainfall, and is generally associated with porous sub-surface geology.

According to the British Geological Survey (BGS)[14] mapping, superficial deposits of Holme Pierrepont Sand and Gravel member are present around Low Marnham, from Fledborough to Woodcoates, and in bands to the west and east of the River Trent. Sand and Gravel is also present in a more widespread area in the east of the Site.

Alluvium deposits of clay, silt, sand and gravel are present along River Trent and in a more limited extent along the existing watercourses within the Site. Areas of blown sand are shown to be located east of the River Trent. An area of the Site located at the far northwestern extent is underlain by superficial deposits of Diamicton.

There are areas within the Site with no mapped superficial deposits, these areas are predominantly in the western side of the River Trent and in a more restricted areas to the east.

The bedrock geology is dominated by mudstone from the Mercia Mudstone Group. This comprises mainly red mudstone with some layers of siltstones or halite-bearing units. Thin sandstone beds may be present. A small section of the Site at the far eastern extent is underlain by mudstones from the Penarth Group. These are grey to black mudstones with occasional limestone or sandstone layers.

Review of BGS borehole records in the vicinity of the Site generally indicates the presence of clay on surface underlain by sandstone, siltstone or mudstone in multiple locations within the Site. Groundwater was encountered between 1.0m and 2.3m below ground level (bgl) in the central areas of the Site where superficial deposits of alluvium are present (generally along the River Trent). Groundwater was not recorded within other boreholes across the Site.

Mapping from the Bassetlaw Level 1 SFRA (**Appendix A6**) shows that areas of the Site located west of the River Trent lie where there is a susceptibility to groundwater flooding ranging from greater than 75% to less than 25%. The areas of highest susceptibility are closest to the Trent's western bank, which is anticipated to be due to the permeable Alluvium superficial deposits.

Development within areas in close proximity to River Trent will be avoided and the potential for groundwater flooding in these locations will therefore have no impact on the proposals. Furthermore, the proposed foundations for the panels and infrastructure will be piled or ground screws, thereby allowing groundwater movement around them. In areas of archaeological interest, foundations may be concrete onto which the mounting structures will be affixed; however, it's anticipated that the foundations will not be to a significant depth and therefore will not impact the flow of groundwater.

Although geology indicates that there is some potential for groundwater emergence at the Site, the mitigation measures put in place for fluvial and pluvial purposes will also provide protection should groundwater flooding occur.

The potential impact from groundwater flooding is therefore considered to be low.

[14] BGS Geology Viewer (BETA)

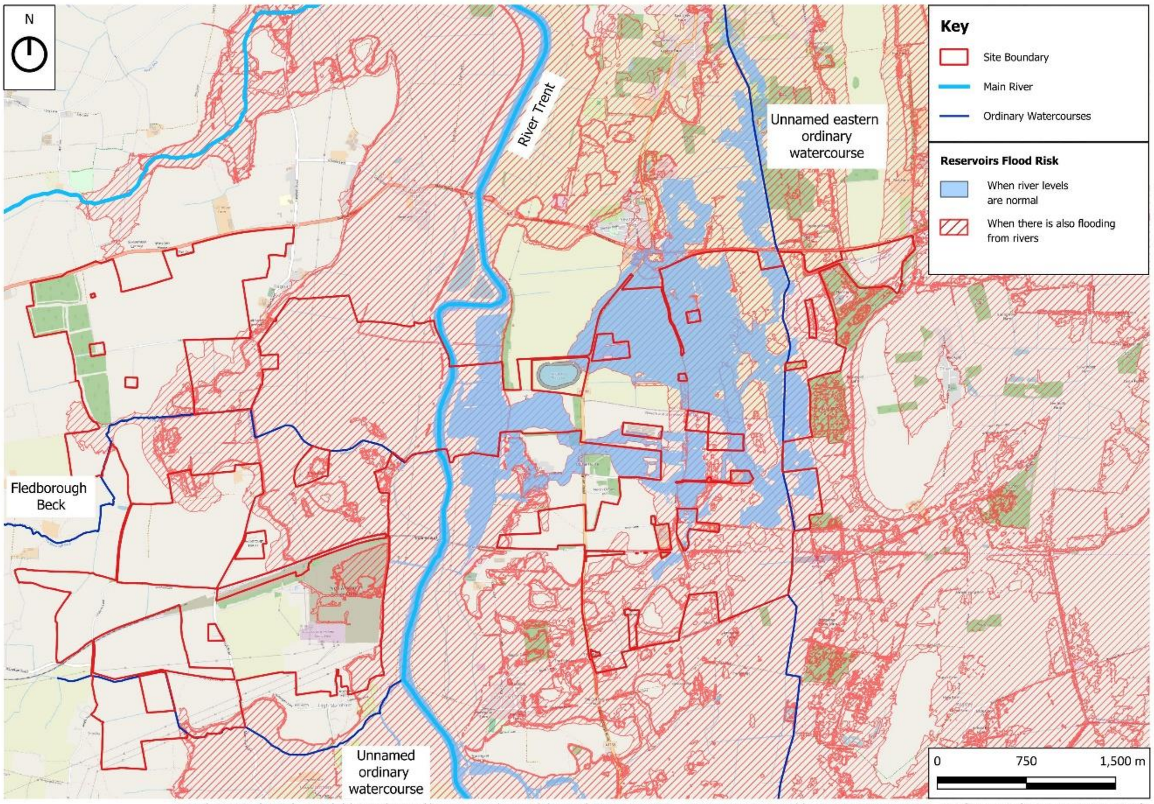
3.5 Artificial Sources

The EA Flood Risk from Reservoirs mapping indicates that large areas of the Site could experience flooding from a breach of reservoirs, both when river levels are normal and when there is flooding from rivers (**Figure 3-30**). It is worth noting however, that reservoirs are maintained to a high standard and are inspected regularly, and as such the chance of reservoir failure is considered to be extremely low.

There is an existing reservoir (Hall Water Reservoir) to the east of the Trent, adjacent to the Site boundary. Should there be a breach of the banks of this reservoir, flows would be either be directed towards to the River Trent to the west or the Unnamed Watercourse to the east. Although the Site could be impacted by these flows, this is considered to be an extremely unlikely event to occur.

The mitigation incorporated in relation to fluvial flood risk would minimise any potential impact in this scenario. The risk of flooding from artificial sources is therefore considered to be low.

Figure 3-30: Environment Agency Flood Risk from Reservoirs



Google Maps (2025). Available at: https://www.google.co.uk/maps/@53.2272889,-0.7682997,6738m/data=!3m1!1e3?entry=ttu (Accessed 21st January 2025)

4 Surface Water Drainage Strategy

4.1 Existing Surface Water Drainage Regime

As the Site spans across 1,500 ha of predominantly agricultural and greenfield land, it is anticipated that surface water largely infiltrates to ground with any exceedance entering the land drains/ditches and watercourses.

It is understood that there is no formal piped network in place to drain the Site.

4.2 Proposed Surface Water Drainage Regime

For the purposes of assessing surface water drainage at the Site, runoff from the following areas is considered in greater detail under the following headings.

- The Solar Panels
- BESS and Sub-station Areas

4.2.1 Solar Panels

In line with research undertaken by Wallingford HydroSolutions[15], solar farms are not considered to result in significant increases in runoff when compared to the existing greenfield situation. This is on the basis that runoff from the panels themselves will simply drop directly to the ground where the natural regime will be maintained. In line with the advice set out by Wallingford HydroSolutions, it is proposed that the following measures will be implemented to ensure that any impacts of the solar panels are minimised:

- Disturbance to existing vegetation during construction will be minimised;
- Any disturbed vegetation will be re-established to maintain good ground cover across the Site;
- Regular inspection and maintenance will be undertaken to ensure that vegetation cover is adequate; and
- Fencing will be provided where required to avoid any disturbance to the vegetation by livestock or similar.

In addition to the above, it is proposed that strategic SuDS features such as filter drains, swales and basins/scrapes are incorporated within the solar array areas to encourage infiltration to the ground and also provide ecological and biodiversity benefits. This approach has been agreed with the LLFA.

4.2.2 BESS and Sub-Station Areas

The sub-stations and battery storage areas are considered to represent more significant areas of hardstanding where surface water runoff would be generated rather than simply infiltrating to the ground (due to the inclusion of impermeable lining being incorporated to prevent potential contamination from infiltrating to ground). With this in mind, a more traditional drainage assessment has been undertaken for these areas and the approaches are discussed below.

[15] Wallingford HydroSolutions, December 2017. [Here comes the sun - WHS (hydrosolutions.co.uk), accessed September 2023]

Surface Water Drainage Hierarchy

In assessing the management of surface water runoff, the following drainage hierarchy (**Table 4-1**) has been utilised which sets out the discharge locations in decreasing order of preference. This is in line with the hierarchy set out within the Local Plan.

Table 4-1: Surface water drainage hierarchy

Discharge Location	Comment
Water Re-use	There is no foreseeable demand for non-potable water on the Site throughout its design life to warrant the inclusion of rainwater harvesting systems. Although the panels will need washing as part of their maintenance, it is proposed that they are washed once every two years, and storing water for this infrequent use is not considered to be practical or proportionate. Although there may be small welfare areas, this will likely include only a small number of toilets which will be infrequently used. As the Site will be unmanned and infrequently visited, it is not considered proportionate to include rainwater harvesting systems for the purposes of toilet flushing. Any proposed fire suppression will have to remain full 100% of the time to be ready should a fire break out. Therefore, as storage will always be fully utilised, rainwater harvesting to feed this system is not considered viable.
To Ground	The underlying geology beneath the sub-station and battery storage areas consists of bedrock geology of mudstone with no superficial deposits. Infiltration to the ground is therefore not considered to be feasible. The provision of unlined SuDS features to encourage some natural infiltration has been considered however, these are not feasible within the BESS and sub-station compounds due to the potential contamination risks associated with fire water runoff which will be contained. Features serving the BESS compound areas will therefore have an impermeable lining to prevent infiltration to the ground. Strategic SuDS features such as filter drains, swales and basins/scrapes that are to be incorporated within the solar array areas however, could be unlined to encourage infiltration to the ground. The exact locations of unlined features within the solar array areas would be assessed further at detailed design. Infiltration testing will be undertaken at detailed design to confirm infiltration potential.
To a Surface Water Body	There are numerous land drains and ordinary watercourses across the Site. It is proposed that runoff from the sub-station/battery storage areas will discharge to these watercourses at greenfield runoff rates.
To a Surface Water Sewer	As above, it is proposed that surface water runoff will discharge to the surrounding watercourses and there is no need to discharge to any public sewer network.
To a Combined Sewer	As above, it is proposed that surface water runoff will discharge to the surrounding watercourses and there is no need to discharge to any public sewer network.

Sustainable Drainage Systems

The most sustainable way to drain surface water runoff is through the use of SuDS, which need to be considered in relation to Site-specific constraints.

SuDS mimic natural drainage and can reduce the quantity of surface water discharged, allowing a reduction of flood risk downstream. In addition, SuDS provide benefits in water quality, biodiversity and amenity.

A variety of SuDS are available to attenuate surface water runoff. In order to adhere to the SuDS hierarchy, the constraints and opportunities for various SuDS have been assessed in **Table 4-2**. Justification is provided as to why certain features have been deemed feasible or unfeasible for use in the Proposed Development.

Table 4-2: BESS and Sub-station Sustainable Drainage Systems

Device	Description	Constraints / Comments	✓/✗
Green/ brown/blue roofs (source control)	Provide soft/hard landscaping at roof level which reduces surface water runoff.	There are limited buildings proposed within the Site and the potential to incorporate green/brown roofs is therefore limited. The potential for inclusion in localised areas however will be assessed further at detailed design.	✓
Soakaways (source control)	Store runoff and allow water to percolate into the ground via natural infiltration.	The underlying geology at the sub-state and battery storage locations consists of impermeable mudstone with no superficial deposits. Soakaways are therefore not considered to be feasible.	✗
Permeable surfaces (source control)	Storm water is allowed to infiltrate through the surface into a storage layer, providing conveyance to attenuation features.	Permeable surfacing and sub-base will be incorporated across the Site wherever possible, to provide water quality benefits and provide conveyance to attenuation features. Within the BESS and Substation areas, any permeable sub-base will be lined to prevent infiltration to the ground.	✓
Rainwater harvesting (source control)	Reduces the annual average rate of runoff from a site by reusing water for non-potable uses e.g., toilet flushing or water butts.	As set out previously (see **Table 4-1**), there is no foreseeable demand for non-potable water on the Site throughout its design life to warrant the inclusion of rainwater harvesting systems.	✗
Swales (permeable conveyance)	Broad shallow channels that convey / store runoff and allow infiltration (ground conditions permitting).	Swales (or managed ditches) will be incorporated wherever appropriate to provide additional SuDS benefits and aid in the management and conveyance of surface water runoff. Within the BESS and Substation areas, any swales will be lined to prevent infiltration to the ground.	✓

Device	Description	Constraints / Comments	✓/✗
Filter drains & perforated pipes (permeable conveyance)	Trenches filled with granular materials (which are designed to take flows from adjacent impermeable areas) that convey runoff while allowing infiltration (ground conditions permitting).	Filter drains will be incorporated wherever possible (potentially in the form of underdrains to the permeable surfacing) to provide additional SuDS Within the BESS and Substation areas, any filter drains will be lined to prevent infiltration to the ground. benefits and aid in the management and conveyance of surface water runoff.	✓
Filter Strips (permeable conveyance)	Wide gently sloping areas of grass or dense vegetation that remove pollutants from runoff from adjacent areas.	On the basis that the majority of the Site will consist of permeable surfacing, there will be limited potential for the inclusion of filter strips. However, the potential to incorporate these locally will be addressed at detailed design. If filter strips are considered feasible within the BESS and Substation areas, these will be lined to prevent infiltration to the ground.	✓
Bioretention Systems / Rain Garden (end of pipe treatment).	A shallow landscaped depression which allows runoff to pond temporarily on the surface before filtering through vegetation and underlying soils. These features can also be accommodated within above ground planters.	On the basis that the majority of the Site will consist of permeable surfacing, there will be limited potential for the inclusion of rain gardens. However, the potential to incorporate these locally will be addressed at detailed design. If rain gardens are considered feasible within the BESS and Substation areas, these will be lined to prevent infiltration to the ground.	✓
Infiltration basins (end of pipe treatment)	Depressions in the surface designed to store runoff and allow infiltration through the base.	The underlying geology at the sub-station and battery storage locations consists of impermeable mudstone with no superficial deposits. Infiltration basins are therefore not considered to be feasible.	✗
Detention Basin / Pond (end of pipe treatment)	Depressions in the surface designed to store runoff without infiltration through the base. Where appropriate, permanent pools can be incorporated.	At each BESS location, detention basin(s) will be incorporated to attenuate surface water runoff prior to discharging at the greenfield rate to surrounding watercourses. Within the BESS and Substation areas, any filter drains will be lined to prevent infiltration to the ground. benefits and aid in the management and conveyance of surface water runoff.	✓
Attenuation underground (end of pipe treatment)	Oversized pipes or geocellular/sectional tanks designed to store water below ground level.	It is proposed that detention basins and other SuDS features will provide the sufficient quantum of storage to manage surface water runoff generated from the BESS locations. This precludes the need for any attenuation tanks.	✗

Proposed Surface Water Drainage Strategy

Drainage Catchments and Greenfield Runoff Rates

In undertaking the calculations to determine the greenfield (Qbar) runoff rates and subsequent attenuation requirements, the impermeable area of each sub-station/battery storage area, including access tracks serving the immediate areas, has been measured and is summarised in **Table 4-3** below and illustrated in **Appendix A8**.

Table 4-3: Summary of Impermeable Catchments

Catchment	Impermeable Area (ha)
1A (Western Sub-Station/Battery Storage – Western Sub-Catchment)	2.096
1B (Western Sub-Station/Battery Storage – Eastern Sub-Catchment)	5.774
2 (Eastern Sub-Station/Battery Storage – North)	4.539
3 (Eastern Sub-Station/Battery Storage – South)	2.781
Total	15.190

In line with policy, it is proposed that runoff from these catchments will be restricted to the Qbar greenfield runoff rate for all events up to and including the 1 in 100 year plus 40% climate change scenario. In calculating the greenfield runoff rates, the following design parameters have been applied:

- Greenfield runoff rates have been calculated in line with the ICP SuDS method (based on the Interim Code of Practice for Sustainable Drainage Systems) which assumes an area of 50 ha and then prorates the value to determine the rate for the catchment area.
- A SAAR value of 587mm was applied to the eastern catchment, taken from the FEH Point Data included in **Appendix A7**.
- A SAAR value of 588mm was applied to the eastern catchment, taken from the FEH Point Data included in **Appendix A7**.

For clarity, the greenfield runoff rate has been calculated to be 2.77 l/s/ha for both the eastern catchment and western catchment and these have been applied to the impermeable area for each catchment to obtain a greenfield rate for that specific location, as set out in **Table 4-4** below.

Table 4-4: Summary of Impermeable Catchments and Greenfield Runoff Rates

Catchment	Impermeable Area (ha)	Qbar Greenfield Runoff Rate (l/s)
1A (Western Sub-Station/Battery Storage - Western Sub-Catchment)	2.096	5.8
1B (Western Sub-Station/Battery Storage – Eastern Sub-Catchment)	5.774	16.0
2 (Eastern Sub-Station/Battery Storage – North)	4.539	12.6
3 (Eastern Sub-Station/Battery Storage – South)	2.781	7.7
Total	15.190	42.1

Drainage Arrangement and Attenuation Requirements

In order to restrict runoff to the Qbar greenfield runoff rate, it is proposed that attenuation will be provided in the form of detention basins located at strategic low points within the catchments (**Appendix A8**).

In modelling the detention basins, the following design parameters have been used to determine the attenuation required:

- The basins have been modelled using InfoDrainage 2025
- FEH 2022 point rainfall data has been utilised (for each location).
- The basins have been designed to accommodate the 1 in 100 year plus 40% climate change event with no flooding.
- To ensure that an outfall by gravity can be provided, the depth of the basins has been limited to between 0.7m and 1.5m. The maximum attenuated water depth modelled is 1.2m in Catchment 1A, providing a freeboard of 300mm.
- Flow controls have been modelled in the form of hydrobrakes.
- It is assumed that the drainage system and SuDS features will have an impermeable lining to prevent any potential contamination to groundwater, should the fire suppression system be activated.

The results of the modelling are summarised in **Table 4-5** below, along with the restricted discharge from each basin. Refer to **Appendix A9** for further clarity on the calculations and **Appendix A8** illustrating the attenuation locations.

Table 4-5: Drainage Strategy Provisions

Detention Basin	Attenuation Provided (m^3)	Discharge (l/s)
Detention Basin 1A (Western Sub-Station/Battery Storage – Western Sub-Catchment)	2,150	5.8
Detention Basin 1B (Western Sub-Station/Battery Storage – Eastern Sub-Catchment)	6,295	16.0
Detention Basin 2 (Eastern Sub-Station/Battery Storage – North)	4,160	12.6
Detention Basin 3 (Eastern Sub-Station/Battery Storage – South)	3,020	7.7
Total	15,625	42.1

The modelling results have indicated that it is not possible to achieve half drain times from the basins within 24 hours due to the restricted rates and associated catchments. An assessment of the capacity of the basins to accommodate consecutive events has therefore been undertaken. An assessment of the 1 in 30 year plus 40% climate change event and a subsequent 1 in 10 year event has therefore been undertaken and confirms there would be sufficient volume within the basin to accommodate this scenario, as set out in **Table 4-6**.

Table 4-6: Summary of Maximum Attenuation Volumes for Consecutive Storms

Detention Basin	1 in 30 year + 40% Climate Change Max Volume (m^3)	1 in 10 year Max Volume (m^3)	Total Max Volume (m^3)	Maximum Volume of Basin (m^3)
Detention Basin 1A (Western Sub-Station/Battery Storage – Western Sub-Catchment)	1,225	633	1,858	2,150
Detention Basin 1B (Western Sub-Station/Battery Storage – Eastern Sub-Catchment)	4,069	2,192	6,261	6,295
Detention Basin 2 (Eastern Sub-Station/Battery Storage – North)	2,700	1,387	4,087	4,160
Detention Basin 3 (Eastern Sub-Station/Battery Storage – South)	1,915	977	2,892	3,020

Should a fire occur at the Site and the fire suppression system is activated, a penstock valve downstream of the basin will be automatically triggered to isolate potentially contaminated discharges. Should this occur, contaminated water would be tankered away and would not discharge to any watercourse. Appropriate arrangements would be put in place prior to operation of the Site following a fire, including the in-situ cleaning, or removal and replacement (if required) of any substrate and taking samples for laboratory analysis. It is worth noting that the automatic penstock valve will include for manual backup operation in case there is an unlikely failure of the automated process.

Although unlikely, the potential for a fire to occur at the same time as a rainfall event has been considered (**Table 4-7**). The basins have therefore been sized to provide sufficient storage to attenuate the 1 in 10 year event plus 228m^3 of firewater (based on firefighting at 1,900 l/minute for 2 hours[16]), with no discharge. The SuDS features will be tanked to impede the percolation of contaminants into the underlying groundwater following a contamination event (e.g. fire).

Table 4-7: Firewater Storage Volumes

Detention Basin	Anticipated Firewater Volume (m^3)	1 in 10 year Max Volume with no discharge (m^3)	Total Max Volume (m^3)	Maximum volume of basin (m^3)
Detention Basin 1A (Western Sub-Station/Battery Storage – Western Sub-Catchment)	228	1,444	1,672	2,150
Detention Basin 1B (Western Sub-Station/Battery Storage – Eastern Sub-Catchment)	228	4,453	4,681	6,295
Detention Basin 2 (Eastern Sub-Station/Battery Storage – North)	228	2,939	3,167	4,160
Detention Basin 3 (Eastern Sub-Station/Battery Storage – South)	228	2,017	2,245	3,020

The surface water drainage strategy and associated calculations are provided within **Appendix A8 and A9** respectively.

[16] National Fire Chiefs Council, 'Grid Scale Battery Energy Storage System planning – Guidance for FRS', Version 1.0. Published April 2023.

Groundwater monitoring will be undertaken at the detailed design stage to confirm the distance from the base of the attenuation features to the groundwater table, and to therefore confirm the potential for groundwater interaction with the drainage system. Soakage testing to confirm infiltration rates will also be undertaken to inform the detailed design stage.

Similarly, at the detailed design stage, surcharged outfall modelling will be considered. However, at this stage and as shown above, the attenuation basins have been sized sufficiently as to attenuate the 1 in 10 year storm and firewater volumes without a positive discharge.

The detailed design will follow the principles set out within this outline drainage strategy and will cover the BESS and substation areas, as well as the solar area and access tracks.

Water Quality

The quality of surface water runoff from the Site has been considered in line with the CIRIA SuDS Manual[17] simple index approach, to ensure appropriate treatment and removal of pollutants prior to discharge. **Table 4-8** is based on Table 26.2 of the SuDS Manual and considers the pollution indices based on the proposed land use. The Proposed Development would include vehicular access and building roofs, and therefore will comprise a 'medium' pollution hazard.

Table 4-8: CIRIA SuDS Manual Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7

Table 4-9 below summarises the mitigation indices that the proposed permeable sub-base and detention basins would provide. As can be seen, the permeable surfaces alone would provide sufficient treatment of runoff prior to discharge to the ordinary watercourse. Additional treatment will also be provided by the detention basin and other SuDS features incorporated.

Table 4-9: CIRIA SuDS Manual SuDS Mitigation Indices – discharges to surface water

SuDS Component	TSS	Metals	Hydrocarbons
Permeable Surfaces	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6

As stated above, in the event of a fire, any contamination within the firewater runoff will be contained within the basin by the automatic activation of a penstock valve before it can be removed from the Site and treated.

[17] CIRIA SuDS Manual (2015) (available at: https://www.susdrain.org/resources/SuDS_Manual.html)

Exceedance Routes

In the event of an extreme storm scenario (of a magnitude greater than the design event) or should there be a blockage in the network, exceedance flows will be directed away from electrical infrastructure and buildings, and flow overland towards the attenuation basins, see **Appendix A8** for clarity. Should exceedance originate from the basins, flow routes would follow existing topography, and ultimately enter the watercourses; the Fledborough Beck in the west, and the local drainage network in the east.

In line with best practice, it is proposed that finished floor levels of all buildings and electrical infrastructure will be raised a minimum of 300mm above external ground levels to minimise the potential for overland flows impacting these areas.

Maintenance Regime

The PPG and CIRIA SuDS Manual sets out the requirement for developers to consider the operation, management, and maintenance of all SuDS for the lifetime of the development.

Post construction, the Applicant would be responsible for the SuDS included within the Proposed Development. **Table 4-10** outlines what maintenance is anticipated for the proposed SuDS features. The maintenance of the SuDS features and drainage network may be appointed to third part maintenance contractor.

Table 4-10: Indicative SuDS maintenance schedule

SuDS and Task	Frequency
Permeable Surfacing	
Brushing	Annually or as required
Stabilise contributing adjacent areas. Removal of weeds. Remediation to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace any lost jointing material.	As required
Jetting of main structure to remove any sediment build-up. Inspection for weed growth and silt accumulation	Annually or as required
Swales	
Removal of litter and debris. Cut grass to maintain grass height within design range. Management of vegetation and nuisance plants. Inspection of inlets and outlets for blockages. Inspection of infiltration services for ponding, siltation and compaction of surfaces.	Monthly
Reseed areas of poor vegetation growth and alter plant types to best suit conditions. Repair erosion or other damaged surfaces by re-turfing or re-seeding. Relevel uneven surfaces and reinstate design flood levels.	As required

SuDS and Task	Frequency
Scarify and spike topsoil layers to promote infiltration, break up silt deposits and prevent compaction of the soil surface. Remove buildup of sediment in upstream and downstream areas.	
Filter Drains	
Removal of litter and debris for drain surface and pre-treatment surfaces (filter strips). Inspection of filter drain surface, inlet and outlet pipework for blockages and structural damage.	Monthly
Remove or control tree roots where any encroachment occurs using recommended methods. Clear any pipe work of any blockages.	As required
Detention Basins	
Removal of litter and debris. Cutting of grass, especially meadow grass in and around the basin. Management of vegetation and nuisance plants in and around the basin. Inspection of inlets and outlets for blockages and clear if required. Inspection of bankside structures and pipework for structural damage.	Monthly
Checking of penstocks and other mechanical devices. Tidy dead growth prior to the growing season. Removal of sediment from inlets and outlets.	Annually
Re-seed areas of poor vegetation growth. Prune and trim any tree cuttings. Repair eroded areas through re-turfing or re-seeding. Realign rip-rap. Repair inlet and outlet features. Relevel uneven surfaces and reinstate design levels.	As required
Manhole/Inspection Chambers and Pipework (including perforated pipework)	
Removal of litter and debris from chambers. Inspect inlet and outlet pipework from chambers. Inspect chamber covers for damage or wear.	Every 6 months or Annually (or if poor performance is noted).
Jetting of main structure/pipework to remove any sediment build-up. Inspection for root/vegetation ingress and silt accumulation	Annually or as required.
Replacement of damaged chambers or pipework	As required following inspection.
Penstock Valve	

SuDS and Task	Frequency
Remove any silt, debris or other deposits that have collected, paying close attention to the penstock's seals, guides and spindle. Operate the valve using both electronic controls and manual operation to ensure functionality and minimise potential for seizing.	Monthly
Check the valve's seal and fixings for signs of wear, damage or corrosion and replace if necessary. Check and relubricate moving parts as necessary with a suitable grease.	Every 6 months or Annually
Hydro-Brake (or other similar Flow Control Devices)	
Inspect the Hydro-Brake and note rate of sediment accumulation	Monthly in the first year and then annually
Inspect for sediment and debris in chamber sump	Annually and after poor performance
Check the condition of the Hydro-Brake and replace if necessary	As required

5 Conclusion

The EA's Flood Map for Planning shows that large areas of the Site are situated within Flood Zones 2 and 3 (medium and high risk of fluvial and tidal flooding), predominantly associated with the River Trent. The Site is afforded protection by a series of flood defences, with protection varying from 1 in 5 years to 1 in 100 years.

Outputs of the EA's Tidal Trent (2023) model have been used to inform the assessment of fluvial and tidal flood risk at the Site. As part of the model review, it was concluded that although there is a slight tidal influence at the Site, fluvial sources are considered to be the dominant source of flooding.

No built development is proposed within the functional floodplain (Flood Zone 3b) and a sequential approach has been taken to the development layout, with sensitive equipment (such as sub-stations and battery storage) located outside of the design flood extent, ensuring they remain operational even in times of flood.

Due to the scale of the development, there is a need to incorporate more frequent inverters and as a result of this, there are locations where these will need to be within the design flood extent. It is proposed that these inverters will be raised above the design flood level with a freeboard of 300mm to ensure protection. At this stage and as a worst case, it is suggested that the inverters be raised on voided structures, that allow the flow and storage of floodwater beneath, thereby having a negligible impact on flood flows and storage capacity. However, once the inverter locations are known at detailed design, options for land raising rather than voided structures will be reviewed and provided where feasible. This is an item that will be confirmed at detailed design and assessed as part of Flood Risk Mitigation Requirement 22 of the DCO (and allowed for within the Outline Design Parameters and Requirement 5 in relation to approval of details design) and will therefore be assessed further at detailed design.

The EA have stated that ideally, panels would be raised above the design flood levels, with 300mm freeboard provided to the base of the panel itself. This is achieved across the majority of the Site by raising the bottom of panel heights (i.e. the height between the ground and base of the panel).

The base of the panels will be raised as required to ensure that the panels will not become submerged and this will be achieved by adjusting the panel angle (within the 10 – 25 degree as set out within the outline design parameters) or by removing the bottom row of panels. Ensuring there will be no submerged panels, means they will not impact on flood flows or storage capacity.

Locations where the bottom of panel height will likely need to be raised beyond the minimum values set out (to ensure they are not submerged) have been illustrated. It is not possible at this stage to confirm the exact bottom of panel height that panels in these areas will be raised to. This however, is an item that will be confirmed at detailed design and approved as part of Flood Risk Mitigation Requirement 22 of the DCO(as well as the Outline Design Parameters and Requirement 5 in relation to approval of detailed design) and will therefore be confirmed at detailed design.

There are some localised locations where it is not possible to provide 300mm freeboard however, the principle of localised reductions in freeboard has been discussed and agreed with the EA.

Although not considered to be a significant concern, a conservative assessment of the potential volume loss associated with the panel mounting structures and inverter voided structures was undertaken to understand the potential impact on flood storage. The conservative assessment indicates that flood level increases of up to 2.2mm could be observed to the west of the River Trent and 3.5mm could be observed to the east of the River Trent. These increases are within the 5mm tolerance that the EA indicated would be acceptable and the impact on fluvial flood risk is therefore considered to be negligible.

The flood volume assessment is an item that will be reviewed and reassessed at detailed design as part of Flood Risk Requirement 22, to ensure the Proposed Development does not impact storage capacity to a greater extent than the 5mm tolerance set out by the EA.

The hydraulic modelling quantifiably shows that through incorporating the potential loss in floodplain storage, alongside taking into account the potential for flow constriction, there would be a negligible increase in flood levels and flood extent outside of the Order Limits, which does not constitute an increase in flood risk. As a result, the Proposed Development is not considered to materially alter flood risk within the surrounding area. Any minor changes in flow are considered to be negligible and would not increase flood risk to any sensitive receptors.

To ensure the development is robust, the impact during a residual event (i.e. if the defences are breached/fail during a flood event) has been considered by interrogating the breach data provided within the EA's Tidal Trent modelling. During the EA's modelled breach scenario, the majority of the panels would still achieve 300mm freeboard above the flood level as recommended by the EA.

The most sensitive equipment within the Site are the BESS and substation areas and further analysis was therefore undertaken to understand the impact of a breach on the western and eastern banks of the Trent. A breach of the flood defences on the western bank of the River Trent would result in partial flooding of the Site and western BESS land parcel. However, sufficient space has been provided within the parcel to allow infrastructure to be placed outside of the estimated breach extent. Furthermore, if required, infrastructure within the BESS compound can be set 300mm above the potential breach flood level to provide protection during the residual risk event.

An assessment of a breach of the defence line to the east of the Trent (in particular, the South Clifton Major Embankment) indicates that the eastern BESS compound is outside the breach flood extents.

Although the Tidal Trent modelling does incorporate some of the existing ordinary watercourses (i.e. the Fledborough Beck), their full extent is not included. In the absence of this, where flooding from the River Trent may not be the dominant source, the low risk pluvial flood event (1 in 100 to 1 in 1000 year event) from the 2024 dataset has been used as a proxy for the design fluvial event. This has been informed by a ReFH2 flow comparison assessment and has been discussed and agreed with the EA. Sensitive equipment has been located away from the low risk surface water flood extent where connected to watercourses, and the fluvial mitigation measures will also provide protection from pluvial flooding. Panels and inverters have been raised above the low risk depths accordingly.

The 2024 and 2025 Risk of Surface Water Flooding datasets have been used to form the assessment of surface water flood risk during the present day and future scenarios. Both datasets identify the majority of the Site to be a very low risk of flooding from pluvial sources. There are however some localised areas within the Site which are shown to be at low, medium and high risk, largely associated with localised depressions and the routes of ordinary watercourses. During the present day low risk scenario, flood depths across the majority of the Order Limits are less than 300mm, with only localised areas where flood depths reach 600mm. The mitigation measures set out to address fluvial flood risk will also provide protection from pluvial flooding.

The risk of flooding from sewers, groundwater and artificial sources has also been assessed and is considered to be low.

Research undertaken by Wallingford HydroSolutions indicates that solar farms are not considered to result in significant increases in runoff when compared to the existing greenfield situation. Disturbance to existing vegetation during construction will be minimised and regular inspection and maintenance will be undertaken to ensure that vegetation cover is adequate to ensure that any impacts of the solar panels on runoff or drainage are minimised. Strategic SuDS features (filter drains, swales, and scrapes) will also be incorporated within the solar array areas to encourage infiltration and also provide ecological benefits.

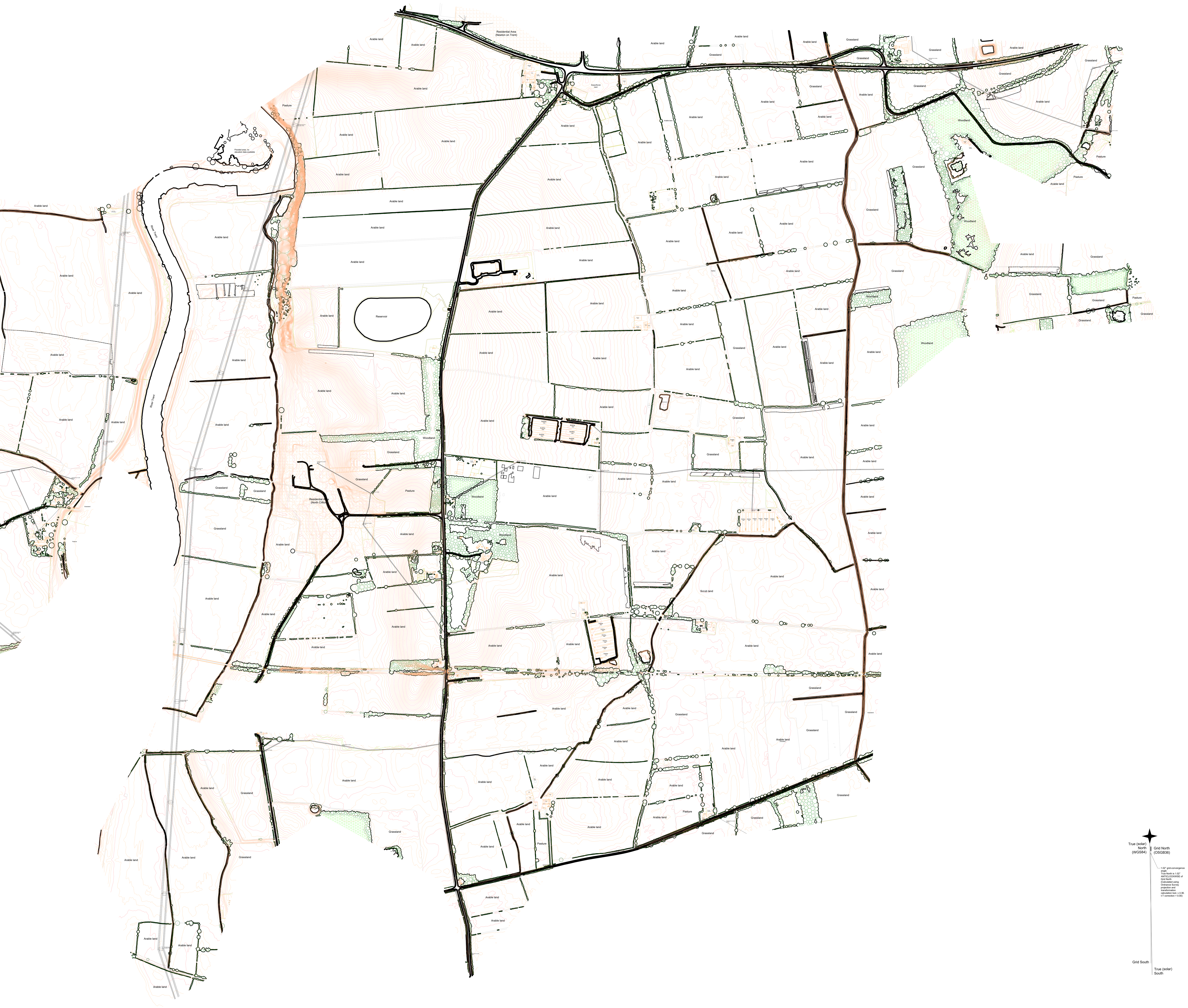
The sub-stations and battery storage areas are considered to represent more significant areas of hardstanding where surface water runoff has the potential to increase surface water flood risk both on Site and downstream. Therefore, surface water runoff from these areas up to and including the 1 in 100 year plus climate change storm will be attenuated and discharged at greenfield rates to mimic the natural drainage regime at the Site. Attenuation will be provided within attenuation basins at natural low points to allow for this restriction to be achieved. Additional SuDS in the form of permeable sub-base beneath the battery units will also be provided. Within the BESS and Substation areas, any permeable sub-base will be lined to prevent infiltration to the ground.

In the event of a fire at the Site, a penstock valve downstream of the basin will be automatically activated to isolate contaminated discharges (with backup operation also available). As such, the basin has also been sized to provide sufficient storage to attenuate the 1 in 10 year rainfall event plus 228m^3 of firewater (as advised by the fire engineer), with no positive discharge until the potentially contaminated runoff has been removed off Site and disposed of in line with environmental regulations.

This report demonstrates that the Proposed Development would result in a negligible impact on fluvial flood risk and that flood risk from other sources would not increase at the Site or in the surrounding area. The Proposed Development would remain operational and safe during times of flood. It is considered that the Proposed Development is in line with the principles of the NPPF, PPG, and local policy, and is therefore appropriate in terms of flood risk and drainage.

6 Appendices

A1 Topographic Survey



SCALE OF MAIN DRAWING:
1:6000 when printed 100% on A0
Do not scale from this plot. All dimensions to be checked on-site.

LEGEND

Tree canopy/hedgerow/foliage. Heights where given are to nearest meter.[1]

Tree shapes for use in *PVcase*. **These do not represent exact tree locations**, but rather, entities which will be automatically recognised and converted to appropriate shading elements by *PVcase*. Areas of forest are therefore filled with trees of appropriate height. Height to nearest meter.[1]

Water (dashed for apparent drainage feature or approx. path)

Sealed road

Unsealed track

Power-line (or other overhead line) with utility post

Fence, gate

Railway track

Public footpath/bridleway

Apparent field boundary (As seen from aerial survey. NOT official boundary.)

UAV mapping boundary (approx.)

Building or other permanent structure

Stone wall

ELEVATIONS

Elevation of point above vertical datum (see 'COORDINATE REFERENCE SYSTEM AND DATUM' at bottom).[2]

Contours (0.25 m) of digital surface model (dashed when over areas of obvious crop or vegetation).[3,4]

G.I.S. DATA

100m grid in OSGB36 map projection

LAT. LONG. The specific lines of latitude and longitude which pass through the site are marked in degrees, minutes, seconds (WGS84).

NORTH Grid North follows the direction of the North-South lines of the OSGB36 grid.
True North follows lines of longitude, which converge on the axis of rotation of the Earth. True South points to the equator.
The convergence angle (precision 2 d.p.) between Grid North and True North for this specific location is given.
Magnetic North is not shown (but will be different again).

Third-party data

Site boundaries from client. Approx. public footpath routes from OS map.

NOTES

1. Heights of hedgerows and dense trees are marked alongside the foliage. All tree/hedge heights given are approximate heights above nearby ground, based on the Digital Surface Model.
2. It is important to note that this grid is from a Surface Model, not a Terrain Model, and therefore point-heights can only be interpreted as terrain when on areas of earth or hardstanding.
3. Likewise, the Contours are surface contours, not terrain contours, so should be interpreted carefully. Where contours are obviously not on earth or hardstanding, they are dashed.
4. Contours are generated from a subsampled (2.5m) terrain model to provide smooth but representative contour lines. Where contours cross trees, the path of the contour below the tree(s) is approximated.
5. Lat./long. lines are precisely calculated, but should be considered approximate because they represent a spherical coordinate system on a map projection. Locations and dimensions are accurate in the underlying map projection. But conversion of coordinates from the map projection to lat./long. (if required) should be performed using the appropriate transformation, not by inference from this plot.
6. Features hidden under dense vegetation (e.g. walls, fences) are only marked if visible from drone footage (or location otherwise provided or noted).

REVISIONS

1.0	22 Dec. 2023	Published to client [TAJC]

PROJECT
PS RENEWABLES - UAV SURFACE TOPOGRAPHY
Project One Earth in Nottinghamshire, U.K.

TITLE
ONE EARTH LINEWORK ("CAD") - EAST

DETAILS
2 Crossways Business Centre, Bicester Road,
Aylesbury HP18 0RA

above
Above Surveying Ltd.
Unit G Knowledge Gateway
Nesfield Road,
Colchester, CO4 3ZL, U.K.
T: +44 1206 483043
E: support@abovesurveying.com

LOCATION
Newark (53.2330, -0.7777)

COORDINATE SYSTEM AND DATUM
OSGB36, British National Grid Map Projection (EPSG: 27700). Units: meters
Elevations relative to sea level as height in meters above Ordnance Datum Newlyn (ODN) (EPSG: 5101). Geoid model, OSGM15.

SCALE OF MAIN DRAWING:
1:6000 when printed 100% on A0
Do not scale from this plot. All dimensions to be checked on-site.

LEGEND

- Tree canopy/hedgerow/foliage. Heights where given are to nearest meter.[1]
- Tree shapes for use in *PVcase*. **These do not represent exact tree locations**, but rather, entities which will be automatically recognised and converted to appropriate shading elements by *PVcase*. Areas of forest are therefore filled with trees of appropriate height. Height to nearest meter.[1]
- Water (dashed for apparent drainage feature or approx. path)
- Sealed road
- Unsealed track
- Power-line (or other overhead line) with utility post
- Fence, gate
- Railway track
- Public footpath/bridleway
- Apparent field boundary (As seen from aerial survey. NOT official boundary.)
- UAV mapping boundary (approx.)
- Building or other permanent structure
- Stone wall

ELEVATIONS

- Elevation of point above vertical datum (see 'COORDINATE REFERENCE SYSTEM AND DATUM' at bottom).[2]
- Contours (0.25 m) of digital surface model (dashed when over areas of obvious crop or vegetation).[3,4]

G.I.S. DATA

- 100m grid in OSGB36 map projection
- LAT. LONG. — The specific lines of latitude and longitude which pass through the site are marked in degrees, minutes, seconds (WGS84).
- NORTH — Grid North follows the direction of the North-South lines of the OSGB36 grid.
  True North follows lines of longitude, which converge on the axis of rotation of the Earth. True South points to the equator.
  The convergence angle (precision 2 d.p.) between Grid North and True North for this specific location is given.
  Magnetic North is not shown (but will be different again).

Third-party data

Site boundaries from client. Approx. public footpath routes from OS map.

NOTES

1. Heights of hedgerows and dense trees are marked alongside the foliage. All tree/hedge heights given are approximate heights above nearby ground, based on the Digital Surface Model.
2. It is important to note that this grid is from a Surface Model, not a Terrain Model, and therefore point-heights can only be interpreted as terrain when on areas of earth or hardstanding.
3. Likewise, the Contours are surface contours, not terrain contours, so should be interpreted carefully. Where contours are obviously not on earth or hardstanding, they are dashed.
4. Contours are generated from a subsampled (2.5m) terrain model to provide smooth but representative contour lines. Where contours cross trees, the path of the contour below the tree(s) is approximated.
5. Lat./long. lines are precisely calculated, but should be considered approximate because they represent a spherical coordinate system on a map projection. Locations and dimensions are accurate in the underlying map projection. But conversion of coordinates from the map projection to lat./long. (if required) should be performed using the appropriate transformation, not by inference from this plot.
6. Features hidden under dense vegetation (e.g. walls, fences) are only marked if visible from drone footage (or location otherwise provided or noted).

REVISIONS

1.0	22 Dec. 2023	Published to client [TAJC]

PROJECT

PS RENEWABLES - UAV SURFACE TOPOGRAPHY
Project One Earth in Nottinghamshire, U.K.

TITLE

ONE EARTH LINEWORK ("CAD") - WEST

DETAILS

2 Crossways Business Centre, Bicester Road,
Aylesbury HP18 0RA

above

Above Surveying Ltd.
Unit G Knowledge Gateway
Nesfield Road,
Colchester, CO4 3ZL, U.K.

T: +44 1206 483043
E: support@abovesurveying.com

LOCATION

Newark (53.2330, -0.7777)

COORDINATE SYSTEM AND DATUM

OSGB36, British National Grid Map Projection (EPSG: 27700). Units: meters
Elevations relative to sea level as height in meters above Ordnance Datum Newlyn (ODN) (EPSG: 5101). Geoid model, OSGM15.

A2 Development Proposals

one earth solar farm

Client: One Earth Solar Farm Ltd

Project: One Earth Solar Farm

Planning Inspectorate Scheme Ref:EN010159

Volume 2

Drawing Title: Illustrative Masterplan

Document Reference Number: EN010159/APP/2.9

Rev. 01

Drawn: JG | Designed: SG | Approved: SG

Drawing Date: 2025-01-06

Scale: 1:10000 @ A1

Legend

- Order Limits
- Existing hedgerows to be retained and enhanced
- Existing vegetation to be retained
- Proposed hedgrows
- Proposed standard trees
- Proposed woodland and tree belts
- Proposed tussock and grassland seed mix
- Proposed hedgerows with trees
- Proposed species-rich grassland seed mix
- Proposed hedgrows and field margin seed mix
- Proposed riparian zone seed mix
- Proposed solar PV Panels, power conversion stations and supporting infrastructure.
- Proposed location of substation and BESS
- Land for potential cable route
- Internal access tracks
- Proposed access points
- Existing PRoW
- Proposed permissive paths

A3 Consultation - Meeting Minutes

A3.1 Environmental Agency (EA) Meeting Minutes

One Earth Solar

Flood Risk Meeting

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

Ref	Commentary	Action
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	

Logika Consultants
24 Greville Street, Farringdon, London, EC1N 8SS

Tel 020 3873 4783
Email accounts@logikaconsultants.co.uk
www.logikaconsultants.co.uk

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

Ref	Commentary	Action
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.	

Logika Consultants
24 Greville Street, Farringdon, London, EC1N 8SS

Tel 020 3873 4783
Email accounts@logikaconsultants.co.uk
www.logikaconsultants.co.uk

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:	26th September 2024	
Time:	14:30	
Location:	Virtual Teams Meeting	
Attendees:	[redacted] - Environment Agency	[redacted] – DWD Planning
	[redacted] – Environment Agency	[redacted] - AECOM
	[redacted]– Environment Agency	[redacted] - Logika
	[redacted]- Environment Agency	[redacted] - Logika
	[redacted] – Iceni	[redacted]- Logika
	[redacted] – 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 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 agreed that a depth of less than 5mm would be acceptable as a tolerance. Logika

[Post Meeting Note: Following a meeting with the EA held on the 11th September 2025, it was agreed that the 5mm tolerance should not be referred to as a "model tolerance" on the basis that this differs for each hydraulic model. The EA confirmed however, that the 5mm tolerance is still considered acceptable for the flood storage assessment and depth increases less than this are considered to have a negligible impact on flood risk]

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 PS 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 618m^3.
    - The potential increase in flood depth is calculated by comparing the flood volume above (618m^3) to the maximum extent of flooding in the design flood event (of 688 hectares).
- PS 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.
- PS 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.
- PS indicated that above assessment was considered to be appropriate and acceptable.

One Earth Solar

Fourth Flood Risk Meeting with Environment Agency

Date:	16th January 2025	
Time:	14:00	
Location:	Virtual Teams Meeting	
Attendees:	[redacted] - Environment Agency	[redacted] - Logika
	[redacted] – Environment Agency	[redacted] - Logika
	[redacted] – Environment Agency	[redacted] - Logika
	[redacted] - Environment Agency	

Ref Commentary Action

1.0 Introductions

1.1 CT led introductions and indicated that the purpose of the meeting was predominantly to run through our progress in relation to the outstanding flood risk / water comments previously provided by the Environment Agency (EA).

1.2 CT also drew attenuation to the pre-Christmas call with PS, from which actions were included in the post-meeting notes within the previous meeting minutes (14529-30-M03-01-F).

2.0 Floodplain Storage Loss

2.1 CT outlined the approach taken to assess floodplain storage loss associated with the panel supports, as requested by the EA. The volume assessment has been undertaken on a conservative basis, calculated using flood depths of up to 1.8m (although not all frames will be flooded to this depth), and across all areas where panels are proposed (not just those within the flood extent).

2.2 Results of the volume assessment indicate that the panels supports would displace approximately 620m^3 of floodwater, but that when compared to the design flood extent within the Site, the increase in flood depth that could be experienced is less than 1mm. CT confirmed this is well within 5mm tolerance as previously discussed with the EA. CT confirmed that this will all be outlined within the FRA, with further information on the calculations provided.

Logika Consultants
24 Greville Street, Farringdon, London, EC1N 8SS

Tel 020 3873 4783
Email accounts@logikaconsultants.co.uk
www.logikaconsultants.co.uk

[<u>Post Meeting Note:</u> Following a meeting with the EA held on the 11th September 2025, it was agreed that the 5mm tolerance should not be referred to as a "model tolerance" on the basis that this differs for each hydraulic model. The EA confirmed however, that the 5mm tolerance is still considered acceptable for the flood storage assessment and depth increases less than this are considered to have a negligible impact on flood risk]

2.3 SH confirmed that the calculations methodology and results were acceptable.

2.4 SM confirmed that in addition to the conservative approach outlined by CT, in reality the floodplain extends beyond the Site boundary. Meaning that any increase in flood depth is likely to be less than that calculated.

3.0 Pluvial / Fluvial Considerations

3.1 CT referred back to the EA comments raised previously in relation to the use of the surface water flood extents as a proxy for fluvial flood extents associated with the Fledborough Beck and Unnamed Ordinary Watercourse to the south.

3.2 CT outlined that analysis had since been undertaken in the form of a ReFH2 assessment for the 100 yr +CC and 1000 yr fluvial and pluvial events. Results indicated a positive correlation between fluvial and pluvial flows within both watercourses, with the 1000 yr event presenting the greater flow rates of the events analysed. As a result, the 1000 yr pluvial event has been used as a proxy for the fluvial 100 yr plus climate change event for the purposes of our assessment. CT concluded that the assessment has been set out within the FRA and that this hopefully gives confidence. The EA agreed to this approach.

4.0 Breach – Western BESS

4.1 CT outlined the EA comments provided within the PEIR with regards to investigating the impact of a breach within the site. CT summarised the analysis that has been undertaken for the western BESS compound, using the highest in channel flood level for the design event and comparing this with ground levels in the western BESS compound area (using LiDAR).

4.2 CT noted that although the parameters plan shows a parcel of land earmarked for the substation and BESS (the edges of which fall within the indicative breach extent), it is not necessary for the entire parcel to be utilised for development. With this in mind, CT shared a figure illustrating the potential BESS and substation layout (as discussed with the One Earth engineering team) and highlighted that no above ground infrastructure would be required within the breach extent.

4.3 SM noted that, due to spatial constraints, there will be a need to locate an attenuation basin within the breach floodplain. It was noted however, that this is considered acceptable on the basis that this is a residual event and therefore unlikely to occur.

4.4 SH confirmed that this was acceptable but indicated that the basins should be outside of the design flood event. SM confirmed this is the case.

4.5 CT confirmed that consultation with the LLFA is ongoing, with a meeting to discuss the surface water drainage proposals to be undertaken in due course.

5.0 Breach – Eastern BESS

5.1 CT stated that a significant area of high ground is located between the River Trent and eastern BESS compound and that flood defences along the eastern bank generally have a standard of protection (SoP) of 1 in 5 yrs, which would be overtopped during the design flood extent. With this in mind, CT noted that the approach taken to assess a breach on the west was not considered appropriate for the eastern BESS compound.

5.2 Based on a review of the flood defence data, the South Clifton Major Embankment provides a SoP of 1 in 100 years and CT noted therefore that a breach at this location and potential flows towards the BESS have been considered.

5.3 CT noted that the EA breach modelling has been assessed for this location (Breach 38) and the result of this have been compared against existing ground levels to establish potential flow routes towards the BESS compound.

5.4 CT acknowledged however that the EA's current breach modelling accounts for the 29% climate change scenario and not the 39% (which is the design climate change allowance). With this in mind, a comparison of the design flood level and modelled breach level at the South Clifton Major Embankment has been undertaken.

5.5 This comparison indicated similar flood levels (80mm greater in the design flood event) and this potential increase in flood level has therefore been applied to levels adjacent to the BESS compound. By comparing these potential breach flood levels to the existing ground levels within the BESS compound, it is concluded that the compound will remain dry even in the breach scenario.

5.6 PS stated that the approach was agreeable and conservative. Furthermore, he indicated that in reality once a breach occurred, flood waters would attenuate across the floodplain which would likely result in a lower flood level near the eastern BESS location.

6.0 Any Other Business

6.1 Maintenance Plan

6.1.1 CT raised a previous comment from SH on the inclusion of a maintenance plan to outline post-flood actions (debris removal, etc.). CT confirmed that this would be covered at high level within the Flood Risk Assessment (FRA).

6.2 Water Framework Directive (WFD) Assessment

6.2.1 CT queried the outstanding questions put to the EA relating to the requirement for a WFD Assessment. JC confirmed receipt of the questions and confirmed he was trying to find the best person to speak to.

6.2.2 CT and SM clarified that we had assumed to date that a WFD Assessment is not required given the significant buffers provided to the watercourses and limited works proposed to the watercourses. It was noted that the submission deadline is getting close and as a result we would appreciate clarity on this as soon as possible so that actions can be taken if required. JC noted he would aim to get a response by next week (w/c 20th January 2025). **JC**

6.3 Submission

6.3.1 CT opened for any other questions / requirements to be included as part of the submission. SH recommended that commentary on decision making within the FRA would be appreciated to illustrate how decisions have been reached.

6.3.2 SM added that it would be good to keep the dialogue open and welcomed the EA to contact us directly with any questions if needed.

6.3.3 JC asked that a heads up be provided if possible, for when reports will be submitted to allow for resourcing to be arranged. SM stated that mid to late February 2025 is the ambition for submission.

A3.2 Lead Local Flood Authority (LLFA) Meeting Minutes

One Earth Solar

OESF Drainage Technical Meeting

Date:	*2nd May 2024*	
Time:	14:00	
Location:	Virtual Teams Meeting	
Attendees:	[redacted] – Principal Officer Notts	[redacted] – Logika EIA
	[redacted] – Policy Team Lincs	[redacted] – Logika Flood and Drainage Project Lead
	[redacted] – Nott Planning Policy Team Manager	[redacted] – Logika Flood and Drainage Consultant
	[redacted]– DWD Planning	

Ref	Commentary	Action
1.0	**Project and Proposals Overview**	
1.1	CT led introductions and indicated that the purpose of the meeting was to provide the Lead Local Flood Authorities (LLFAs) with an overview of the development proposals as well as the approach to flood risk management and drainage.	
1.2	GP provided an overview of the aims of the project and the indicative masterplan as it stands. Particular reference was made to where constraints are to development to provide context of how the masterplan has been worked up.	
3.0	**Flood Risk Considerations**	
3.1	CT indicated that the baseline flood risk and current approach to managing flooding has been discussed with the EA in two initial meetings and has been agreed in principle. It was noted that the LLFA are unlikely to comment on the flood risk elements in significant detail (like they would for surface water drainage) however, in interests of providing wider context CT indicated that he would share a summary of flood risk at the Site.	
3.2	CT shared a plan which illustrated that the Site is located on either side of the River Trent and that large areas lie within Flood Zone 2 and 3 indicating a medium and high probability of flooding from the River Trent and its tributaries. CT noted however, that the large areas of the Site are	

Logika Consultants
24 Greville Street, Farringdon, London, EC1N 8SS

Tel 020 3873 4783
Email accounts@logikaconsultants.co.uk
www.logikaconsultants.co.uk

shown to have a reduction in flood risk as a result of the defences present.

3.3 CT indicated that the assessment of flood risk has been based on modelled data provided by the EA (i.e. the River Trent Model 2023). Based on the modelling outputs, the more significant flooding at the Site is fluvially dominated and this has therefore been used in determining the design flood event.

3.4 CT indicated that the proposals comprise a nationally significant solar farm and the development is therefore considered to be essential infrastructure which is acceptable within the floodplain. CT noted that a sequential approach to the layout and mitigation is being taken (i.e. more sensitive equipment is to be located away from areas of flooding wherever feasible).

3.5 CT indicated that the design flood event is the fluvially dominated 1 in 100 year plus 39% climate change scenario which is being considered when assessing any mitigation proposals.

3.6 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.

3.7 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.

3.8 CT noted that in general, panels will be designed such that their base will be raised 750mm above the ground level as a minimum. Where required however, it is proposed that panels will be raised further (where flood depths are greater).

3.9 CT indicated that the maximum height that the base of the panels can be raised to is 1.8m (i.e. height from ground level to the basis of the panel). 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.

4.0 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.

4.1 CT shared a figure illustrating a summary of freeboards achieved and indicated that in general, it is aimed for development to avoid the areas of flooding greater than 1.5m. 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.

4.2 CT indicated that a freeboard would still be provided for much of the area noted above, it is just that the freeboard is less than 300mm. It was acknowledged however, that the base of the panels would be subject to flooding in some localised areas (even when the panel bases are raised to 1.8m). CT reiterated that this is localised and that the maximum depth of flooding above the base of the panels would be within the range of 300-600mm and this has been agreed in principle with the EA.

4.3 CT touched briefly on residual breach flood risk, indicating that the principles of freeboard allowances are similar in the breach scenario. CT noted that although there are larger areas where reduced freeboard or some flooding to the base of the panels would be experienced, this is localised in nature and a breach is unlikely to occur.

4.4 CT shared a figure showing surface water flood risk and noted that in general, the risk was shown to be very low to low across the majority of the Site. CT highlighted that the mitigation proposed for fluvial flooding would also provide protection from surface water flooding.

4.5 SS and IF confirmed that the approaches to flood risk were reasoned and agreeable.

5.0 Surface Water Drainage Strategy and SuDS

5.1 CT indicated that the design is still in its early stages and therefore there are no specific drainage proposals to share at this point. It was highlighted however, that the purpose of this discussion was to outline the drainage design principles and gain commentary from the LLFA(s).

5.2 CT noted that a quantified strategy would not be prepared for the solar farm areas (i.e. for the panel areas). This is on the basis that runoff from the panels will simply discharge to the greenfield ground beneath, meaning there is very little to negligible change in runoff conditions. SS and IF agreed that this approach is common to solar farms and raised no concerns.

5.3 CT indicated however, that SuDS in the form of swales, filter drains and localised basins will be provided strategically within the solar farm areas to promote natural infiltration. It was noted that the location of these features will be confirmed at detailed design (given the outline nature of the submission).

5.4 CT acknowledged that there will however, be significant increases in hardstanding land where the BESS and sub-station uses are proposed and indicated that a quantified strategy will be prepared for these areas. As part of this strategy, it is proposed that surface water runoff will be restricted to the greenfield rate (Qbar) for all events up to and including the 1 in 100 year plus climate change scenario. CT noted that outfalls would be provided to the surrounding ordinary watercourses and that attenuation would be provided in the form detention basins along with other SuDS features including permeable surfacing and swales where appropriate.

5.5 SS and IF welcomed the approach to managing runoff from the BESS and substation areas.

5.6 CT queried whether the LLFA(s) would accept a variable discharge approach to runoff (with long term storage), should there be a need. SS and IF confirmed this would be accepted if required.

6.0 Any Other Business

6.1 CT noted that an offset of 10m will be provided between the existing ordinary watercourses and any built development and that works to the watercourses will be limited.

6.2 SS indicated that the Trent Valley Internal Drainage Board (IDB) are responsible for ordinary watercourses within the Site and that they will comment on anything relating to this.

6.3 GP queried what measures the LLFA would expect to see for the management of surface water runoff during construction. SS indicated that they would like to see some indication of how runoff will be managed within the Construction Environmental Management Plan (CEMP).

One Earth Solar

OESF Flood and Drainage Technical Meeting

Date:	*7th February 2025*
Time:	10:30
Location:	Virtual Teams Meeting
Attendees:	[redacted] – Policy Team Lincolnshire County Council (the Lead Local Flood Authority, LLFA)
	[redacted] – Logika Flood and Drainage Project Lead
	[redacted] – Logika Flood and Drainage Senior Consultant

Ref	Commentary	Action
1.0	**Project Overview (CT)**	
1.1	CT provided a short introduction to the project, proposals and approach to flood risk mitigation, the content of which has been agreed with the EA and is generally in line with previous discussions.	
1.2	CT summarised the approach to flood risk mitigation as below:	

- Development will be avoided in Flood Zone 3b (30yr extent).
- More sensitive infrastructure (BESS and substation compounds) has been sequentially located such that its infrastructure can be located outside of the design fluvial flood extent (100 yr +39%CC). Most inverters have been located outside of the floodplain, but due to operational requirements this has not been possible for all. Where this is the case, mitigation will be included as agreed with the EA.
- Panels will be raised to a maximum of 1.8m to provide a 300mm freeboard above flood depths of 1.5m. It is not possible to raise panels further due to visual impacts and other constraints, meaning that during the design flood, some localised areas of panels may flood. This approach has been agreed with the EA and will have a limited impact on the site's operational capability.
- Logika have discussed and agreed a quantified approach to the assessment of the residual breach scenario with the EA.

Logika Consultants
24 Greville Street, Farringdon, London, EC1N 8SS

Tel 020 3873 4783
Email accounts@logikaconsultants.co.uk
www.logikaconsultants.co.uk

1.3 CT stated that details of agreements that have been discussed with the EA have been minuted and will be appended to the FRA for clarity.

1.4 CT confirmed that the DCO was intended to be submitted by the end of this month (February 2025).

1.5 A quick recap of Lincolnshire's boundary was given, highlighting that only the northeastern corner of the site falls within their jurisdiction.

1.6 Since the previous meeting with Lincolnshire County Council (LLFA), Logika have had the opportunity to progress the drainage design, which will form the main focus of this meeting.

2.0 Surface Water Drainage (CT / ST)

2.1 CT confirmed that as discussed and agreed previously, a quantified drainage strategy for the solar panels will not be provided. Instead, SuDS features such as interception swales and filter drains will be strategically located to intercept runoff, promote infiltration and reduce the likelihood of erosion. This remains the approach for these areas and is commonplace for solar panel developments.

2.2 CT then explained that the approach to the larger areas of hardstanding (i.e. the BESS / Substation compounds) would include the provision of a quantified drainage strategy. The principles for both BESS compounds' drainage strategies are the same, although only the eastern BESS compound falls within Lincolnshire's boundary.

2.3 ST provided a summary of the principles of the drainage strategy for the eastern BESS compound, as summarised below:

- The eastern BESS compound is split into two sub-catchments; north and south. Catchment areas have been assumed to be 100% impermeable as the SuDS features and drainage network will be tanked to stop any potential pollutants (that could occur from a leak or from fire runoff) entering soils / groundwater. Penstock valves will be located downstream of the final attenuation features (detention basins) to avoid discharge of polluted surface water to the receiving watercourse network during a pollution event.
- Areas surrounding the batteries will be permeably surfaced with a permeable subbase to provide some attenuation, conveyance and treatment.
- Runoff from each sub catchment will be routed to its respective basin, where sufficient attenuation is provided to restrict discharge to the Qbar greenfield rate during all events up to and including the 100yr plus climate change event. During the 100yr plus climate change event the basins do not half drain within 24hrs, therefore the

basins have been sized to also accommodate consecutive storms (the 30yr plus climate change and 10yr events).

- The basins provide sufficient attenuation to accommodate the 10 year storm plus an allowance for firewater with no discharge (i.e. if the penstock valve is activated).
- A series of scrapes / pools will also be located in the base of the basins to provide ecological enhancements; however, these have not been included within the attenuation calculations.
- The basins and BESS infrastructure have been located outside of the design fluvial flood extent and the surface water 1000yr flood extent (2024 and 2025 mapping).

2.4	IF confirmed that the strategy set out was all agreeable but queried whether an allowance for runoff from the BESS compound access tracks had been included in the drainage calculations. CT confirmed that this had not been allowed for, but that should it be preferred, this could be included. IF recommended that an indicative access track (approximately 7m in width) be shown and included within the catchment areas, rather than inclusion of a nominal allowance or percentage.	Logika
3.0	**Any Other Business**	
3.1	*Consents*	
3.1.1	CT confirmed that ordinarily consents required under the land drainage act would be applied for post planning. However, for most DCO's, those requirements are disapplied, with commitments to protective provisions made upfront as part of the DCO. CT queried whether the LLFA have any involvement in these discussions or whether this sits solely with the Trent Valley Internal Drainage Board (IDB)	
3.1.2	IF confirmed that consents are dealt with by the IDB rather than the LLFA in this area.	
3.2	*Other*	
3.2	IF asked for the county boundary plan to be circulated with the meeting minutes.	Logika

One Earth Solar

OESF Flood and Drainage Technical Meeting

Date:	*10th February 2025*
Time:	10:00
Location:	Virtual Teams Meeting
Attendees:	[redacted] – Principal Officer Nottinghamshire (the Lead Local Flood Authority, LLFA)
	[redacted] – Logika Flood and Drainage Project Lead
	[redacted]– Logika Flood and Drainage Senior Consultant

Ref	Commentary	Action
1.0	**Project Overview (CT)**	
1.1	CT provided a short introduction to the project, proposals and approach to flood risk mitigation, the content of which has been agreed with the EA and is generally in line with previous discussions.	
1.2	CT summarised the approach to flood risk mitigation as below: • Development will be avoided in Flood Zone 3b (30yr extent). • More sensitive infrastructure (BESS and substation compounds) has been sequentially located such that its infrastructure can be located outside of the design fluvial flood extent (100 yr +39%CC). Most inverters have been located outside of the floodplain, but due to operational requirements this has not been possible for all. Where this is the case, mitigation will be included as agreed with the EA. • Panels will be raised to a maximum of 1.8m to provide a 300mm freeboard above flood depths of 1.5m. It is not possible to raise panels further due to visual impacts and other constraints, meaning that during the design flood, some localised areas of panels may flood. This approach has been agreed with the EA and will have a limited impact on the site's operational capability. • Logika have discussed and agreed a quantified approach to the assessment of the residual breach scenario with the EA.	

1.3 CT stated that details of agreements that have been discussed with the EA have been minuted and will be appended to the FRA for clarity.

1.4 CT confirmed that the DCO was intended to be submitted by the end of this month (February 2025).

1.5 A quick recap of Nottinghamshire's boundary was given, highlighting that the majority of the site falls within their jurisdiction, with only the northeastern corner of the site falling within Lincolnshire.

1.6 Since the previous meeting with Nottinghamshire County Council (LLFA), Logika have had the opportunity to progress the drainage design, which will form the main focus of this meeting.

2.0 Drainage (CT / ST)

2.1 CT confirmed that as discussed and agreed previously, a quantified drainage strategy for the solar panels will not be provided. Instead, SuDS features such as interception swales and filter drains will be strategically located to intercept runoff, promote infiltration and reduce the likelihood of erosion. This remains the approach for these areas and is commonplace for solar panel developments.

2.2 CT then explained that the approach to the larger areas of hardstanding (i.e. the BESS / Substation compounds) would include the provision of a quantified drainage strategy. The principles for both BESS compounds' drainage strategies are the same, although only the western BESS compound falls within Nottinghamshire's boundary.

2.3 ST provided a summary of the principles of the drainage strategy for the eastern BESS compound, as summarised below:

- The western BESS compound is split into two sub-catchments; west and east. Catchment areas have been assumed to be 100% impermeable as the SuDS features and drainage network will be tanked to stop any potential pollutants (that could occur from a leak or from fire runoff) entering soils / groundwater. Penstock valves will be located downstream of the final attenuation features (detention basins) to avoid discharge of polluted surface water to the receiving watercourse network during a pollution event.

- Areas surrounding the batteries will be permeably surfaced with a permeable subbase to provide some attenuation, conveyance and treatment.

- Runoff from each sub catchment will be routed to its respective basin, where sufficient attenuation is provided to restrict discharge to the Qbar greenfield rate during all events up to and including the 100yr plus climate change event. During the 100yr plus climate change event the basins do not half drain within 24hrs, therefore the basins have been sized to also accommodate consecutive storms (the 30yr plus climate change and 10yr events).

- The basins provide sufficient attenuation to accommodate the 10 year storm plus an allowance for firewater with no discharge (i.e. if the penstock valve is activated).
- A series of scrapes / pools will also be located in the base of the basins to provide ecological enhancements; however, these have not been included within the attenuation calculations.
- The basins and BESS infrastructure have been located outside of the design fluvial flood extent and the surface water 1000yr flood extent (2024 and 2025). As agreed with the EA, the 2024 risk of flooding from surface water dataset has been used as a proxy for the fluvial design flood extent associated with the Fledborough Beck in the absence of detailed modelling. The 2025 risk of flooding from surface water dataset shows a betterment of surface water flooding in this area.
- The batteries, substation and western SuDS basin have all been located outside of the indicative breach extent. However, due to spatial constraints the eastern basin has been located within the breach extent. SS confirmed that this was acceptable given that the breach only forms a residual risk.

2.4 SS confirmed that whilst discharging at the Qbar greenfield rates was agreed from the LLFA. He did however recommend that this also be discussed with the Trent Valley Internal Drainage Board (IDB).

2.5 SS sought clarification on how the catchment areas had been modelled. CT confirmed that the catchment areas had been modelled as 100% impermeable to provide a conservative basis for assessment. SS agreed that this approach was acceptable.

2.6 CT summarised that during a meeting with Lincolnshire LLFA, a query had been raised in relation to whether an allowance for runoff from the BESS compound access tracks had been included in the drainage calculations. Following discussions it was agreed that an indicative access track (7m in width) be shown and included within the catchment areas. It is our intention to utilise the same approach for both BESS compounds, and therefore an indicative access track would be included within the calculations. SS agreed that this approach was acceptable.

3.0 AOB

3.1 Access and Egress

3.1.1 In relation to Point 2.7 above, SS queried whether safe access and egress would be provided. CT confirmed that safe access and egress was definitely a consideration, and that a flood emergency response and management plan will be provided post planning. CT also confirmed that the proposed development will be largely remotely operated, and that occupancy will be fairly low. Furthermore, as part of any future emergency response plans, there will be a requirement for the operators to sign up to the EA's flood warning system which will provide alerts prior to a potential flood event.

3.2 Consents

3.2.1 CT confirmed that ordinarily consents required under the land drainage act would be applied for post planning. However, for most DCO's, those requirements are disapplied, with commitments to protective provisions made upfront as part of the DCO. CT queried whether the LLFA have any involvement in these discussions or whether this sits solely with the Trent Valley Internal Drainage Board (IDB)

3.2.2 SS confirmed that consents would be dealt with by the IDB in this area.

A4 ReFH2 Flow Comparison Assessment

A4.1 Fledborough Beck

	100 + 39% CC			1000		
Time	Direct runoff m3/s	Baseflow m3/s	Total flow m3/s	Direct runoff m3/s	Baseflow m3/s	Total flow m3/s
00:00:00	0.00	0.34	0.34	0.00	0.34	0.34
01:00:00	0.01	0.34	0.34	0.01	0.34	0.34
02:00:00	0.03	0.33	0.35	0.03	0.33	0.36
03:00:00	0.07	0.32	0.39	0.08	0.32	0.40
04:00:00	0.14	0.32	0.46	0.17	0.32	0.49
05:00:00	0.28	0.31	0.59	0.33	0.32	0.64
06:00:00	0.50	0.32	0.81	0.59	0.32	0.91
07:00:00	0.85	0.32	1.17	1.01	0.32	1.34
08:00:00	1.34	0.34	1.68	1.60	0.34	1.94
09:00:00	1.94	0.36	2.30	2.32	0.37	2.69
10:00:00	2.59	0.40	2.99	3.12	0.41	3.53
11:00:00	3.27	0.45	3.72	3.95	0.47	4.42
12:00:00	3.95	0.51	4.46	4.77	0.54	5.31
13:00:00	4.58	0.58	5.16	5.54	0.62	6.16
14:00:00	5.11	0.67	5.78	6.20	0.72	6.92
15:00:00	5.49	0.76	6.25	6.67	0.82	7.49
16:00:00	5.64	0.85	6.50	6.87	0.93	7.79
17:00:00	5.59	0.95	6.54	6.81	1.03	7.84
18:00:00	5.39	1.04	6.42	6.57	1.13	7.70
19:00:00	5.08	1.12	6.20	6.20	1.22	7.42
20:00:00	4.71	1.19	5.90	5.75	1.31	7.06
21:00:00	4.31	1.25	5.56	5.26	1.38	6.64
22:00:00	3.89	1.31	5.20	4.75	1.44	6.20
23:00:00	3.49	1.35	4.85	4.27	1.49	5.76
24:00:00	3.13	1.39	4.52	3.83	1.53	5.36
25:00:00	2.82	1.42	4.23	3.44	1.57	5.01
26:00:00	2.54	1.44	3.98	3.10	1.59	4.69
27:00:00	2.29	1.45	3.75	2.80	1.61	4.41
28:00:00	2.06	1.46	3.53	2.52	1.62	4.14
29:00:00	1.85	1.47	3.32	2.26	1.63	3.89
30:00:00	1.64	1.47	3.11	2.00	1.63	3.64
31:00:00	1.43	1.47	2.90	1.75	1.63	3.39
32:00:00	1.23	1.46	2.69	1.51	1.62	3.13
33:00:00	1.03	1.45	2.48	1.26	1.61	2.88
34:00:00	0.84	1.44	2.28	1.03	1.60	2.63
35:00:00	0.65	1.42	2.07	0.80	1.58	2.38
36:00:00	0.48	1.40	1.88	0.59	1.56	2.14
37:00:00	0.33	1.38	1.70	0.40	1.53	1.93
38:00:00	0.20	1.35	1.55	0.25	1.50	1.75
39:00:00	0.12	1.32	1.44	0.15	1.47	1.62
40:00:00	0.06	1.30	1.36	0.08	1.44	1.52
41:00:00	0.03	1.27	1.30	0.04	1.41	1.45
42:00:00	0.01	1.24	1.25	0.02	1.38	1.39
43:00:00	0.00	1.21	1.21	0.00	1.35	1.35
44:00:00	0.00	1.18	1.18	0.00	1.32	1.32
45:00:00	0.00	1.16	1.16	0.00	1.29	1.29
46:00:00	0.00	1.13	1.13	0.00	1.26	1.26
47:00:00	0.00	1.11	1.11	0.00	1.23	1.23
48:00:00	0.00	1.08	1.08	0.00	1.20	1.20
49:00:00	0.00	1.06	1.06	0.00	1.17	1.17
50:00:00	0.00	1.03	1.03	0.00	1.15	1.15
51:00:00	0.00	1.01	1.01	0.00	1.12	1.12
52:00:00	0.00	0.99	0.99	0.00	1.10	1.10
53:00:00	0.00	0.96	0.96	0.00	1.07	1.07
54:00:00	0.00	0.94	0.94	0.00	1.05	1.05
55:00:00	0.00	0.92	0.92	0.00	1.02	1.02
56:00:00	0.00	0.90	0.90	0.00	1.00	1.00
57:00:00	0.00	0.88	0.88	0.00	0.98	0.98
58:00:00	0.00	0.86	0.86	0.00	0.96	0.96
59:00:00	0.00	0.84	0.84	0.00	0.93	0.93
60:00:00	0.00	0.82	0.82	0.00	0.91	0.91
61:00:00	0.00	0.80	0.80	0.00	0.89	0.89
62:00:00	0.00	0.78	0.78	0.00	0.87	0.87
63:00:00	0.00	0.77	0.77	0.00	0.85	0.85
64:00:00	0.00	0.75	0.75	0.00	0.83	0.83
65:00:00	0.00	0.73	0.73	0.00	0.81	0.81
66:00:00	0.00	0.72	0.72	0.00	0.80	0.80
67:00:00	0.00	0.70	0.70	0.00	0.78	0.78

68:00:00	0.00	0.68	0.68	0.00	0.76	0.76
69:00:00	0.00	0.67	0.67	0.00	0.74	0.74
70:00:00	0.00	0.65	0.65	0.00	0.73	0.73
71:00:00	0.00	0.64	0.64	0.00	0.71	0.71
72:00:00	0.00	0.62	0.62	0.00	0.69	0.69
73:00:00	0.00	0.61	0.61	0.00	0.68	0.68
74:00:00	0.00	0.60	0.60	0.00	0.66	0.66
75:00:00	0.00	0.58	0.58	0.00	0.65	0.65
76:00:00	0.00	0.57	0.57	0.00	0.63	0.63
77:00:00	0.00	0.56	0.56	0.00	0.62	0.62
78:00:00	0.00	0.54	0.54	0.00	0.61	0.61
79:00:00	0.00	0.53	0.53	0.00	0.59	0.59
80:00:00	0.00	0.52	0.52	0.00	0.58	0.58
81:00:00	0.00	0.51	0.51	0.00	0.57	0.57
82:00:00	0.00	0.50	0.50	0.00	0.55	0.55
83:00:00	0.00	0.49	0.49	0.00	0.54	0.54
84:00:00	0.00	0.47	0.47	0.00	0.53	0.53
85:00:00	0.00	0.46	0.46	0.00	0.52	0.52
86:00:00	0.00	0.45	0.45	0.00	0.50	0.50
87:00:00	0.00	0.44	0.44	0.00	0.49	0.49
88:00:00	0.00	0.43	0.43	0.00	0.48	0.48
89:00:00	0.00	0.42	0.42	0.00	0.47	0.47
90:00:00	0.00	0.41	0.41	0.00	0.46	0.46
91:00:00	0.00	0.40	0.40	0.00	0.45	0.45
92:00:00	0.00	0.40	0.40	0.00	0.44	0.44
93:00:00	0.00	0.39	0.39	0.00	0.43	0.43
94:00:00	0.00	0.38	0.38	0.00	0.42	0.42
95:00:00	0.00	0.37	0.37	0.00	0.41	0.41
96:00:00	0.00	0.36	0.36	0.00	0.40	0.40
97:00:00	0.00	0.35	0.35	0.00	0.39	0.39
98:00:00	0.00	0.00	0.00	0.00	0.38	0.38
99:00:00	0.00	0.00	0.00	0.00	0.37	0.37
100:00:00	0.00	0.00	0.00	0.00	0.37	0.37
101:00:00	0.00	0.00	0.00	0.00	0.36	0.36
102:00:00	0.00	0.00	0.00	0.00	0.35	0.35
	5.64	1.47	**6.54**	**6.87**	1.63	7.84

Percentage Diff 4.77%

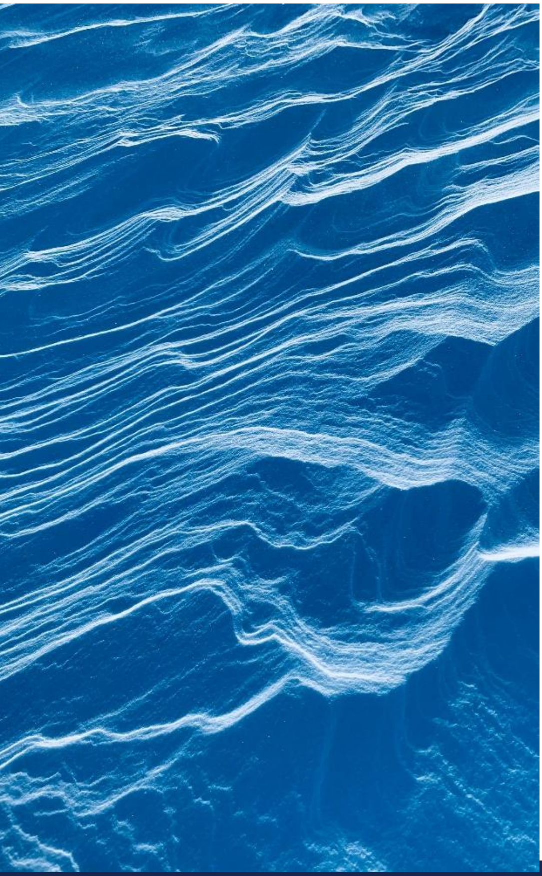
A4.2 Marnham Ordinary Watercourse

	1 in 100 + 39% CC			1 in 1000		
Time	Direct runoff m3/s	Baseflow m3/s	Total flow m3/s	Direct runoff m3/s	Baseflow m3/s	Total flow m3/s
00:00:00	0.00	0.22	0.22	0.00	0.22	0.22
01:00:00	0.01	0.22	0.22	0.01	0.22	0.22
02:00:00	0.03	0.21	0.24	0.03	0.21	0.24
03:00:00	0.08	0.21	0.29	0.09	0.21	0.30
04:00:00	0.18	0.20	0.38	0.21	0.20	0.42
05:00:00	0.36	0.20	0.56	0.43	0.20	0.63
06:00:00	0.68	0.21	0.88	0.81	0.21	1.02
07:00:00	1.13	0.22	1.35	1.36	0.22	1.58
08:00:00	1.68	0.24	1.92	2.03	0.25	2.27
09:00:00	2.27	0.27	2.54	2.75	0.28	3.03
10:00:00	2.87	0.31	3.18	3.48	0.33	3.80
11:00:00	3.42	0.36	3.78	4.16	0.38	4.54
12:00:00	3.86	0.42	4.29	4.71	0.45	5.16
13:00:00	4.12	0.48	4.61	5.03	0.52	5.55
14:00:00	4.15	0.55	4.70	5.07	0.59	5.66
15:00:00	3.99	0.61	4.60	4.89	0.66	5.55
16:00:00	3.73	0.67	4.40	4.57	0.73	5.30
17:00:00	3.40	0.72	4.12	4.17	0.78	4.95
18:00:00	3.04	0.76	3.80	3.73	0.83	4.56
19:00:00	2.68	0.79	3.47	3.28	0.87	4.16
20:00:00	2.35	0.82	3.17	2.88	0.90	3.78
21:00:00	2.07	0.84	2.91	2.54	0.93	3.46
22:00:00	1.83	0.86	2.69	2.24	0.94	3.19
23:00:00	1.62	0.87	2.48	1.98	0.96	2.94
24:00:00	1.42	0.87	2.29	1.74	0.96	2.70
25:00:00	1.23	0.88	2.11	1.51	0.97	2.48
26:00:00	1.05	0.87	1.93	1.29	0.97	2.26
27:00:00	0.87	0.87	1.74	1.07	0.96	2.04
28:00:00	0.70	0.86	1.56	0.86	0.96	1.81
29:00:00	0.53	0.85	1.38	0.65	0.95	1.60
30:00:00	0.37	0.84	1.21	0.46	0.93	1.39
31:00:00	0.24	0.83	1.06	0.29	0.91	1.21
32:00:00	0.14	0.81	0.94	0.17	0.90	1.06
33:00:00	0.07	0.79	0.86	0.09	0.88	0.96
34:00:00	0.03	0.77	0.80	0.04	0.85	0.90
35:00:00	0.01	0.75	0.76	0.02	0.83	0.85
36:00:00	0.00	0.73	0.74	0.00	0.81	0.82
37:00:00	1.97526397102156E	0.72	0.72	2.46649598409332E	0.79	0.79
38:00:00	0.00	0.70	0.70	0.00	0.77	0.77
39:00:00	0.00	0.68	0.68	0.00	0.75	0.75
40:00:00	0.00	0.66	0.66	0.00	0.74	0.74
41:00:00	0.00	0.65	0.65	0.00	0.72	0.72
42:00:00	0.00	0.63	0.63	0.00	0.70	0.70
43:00:00	0.00	0.62	0.62	0.00	0.68	0.68
44:00:00	0.00	0.60	0.60	0.00	0.66	0.66
45:00:00	0.00	0.59	0.59	0.00	0.65	0.65
46:00:00	0.00	0.57	0.57	0.00	0.63	0.63
47:00:00	0.00	0.56	0.56	0.00	0.62	0.62
48:00:00	0.00	0.54	0.54	0.00	0.60	0.60
49:00:00	0.00	0.53	0.53	0.00	0.59	0.59
50:00:00	0.00	0.52	0.52	0.00	0.57	0.57
51:00:00	0.00	0.50	0.50	0.00	0.56	0.56
52:00:00	0.00	0.49	0.49	0.00	0.54	0.54
53:00:00	0.00	0.48	0.48	0.00	0.53	0.53
54:00:00	0.00	0.47	0.47	0.00	0.52	0.52
55:00:00	0.00	0.45	0.45	0.00	0.50	0.50
56:00:00	0.00	0.44	0.44	0.00	0.49	0.49
57:00:00	0.00	0.43	0.43	0.00	0.48	0.48
58:00:00	0.00	0.42	0.42	0.00	0.47	0.47
59:00:00	0.00	0.41	0.41	0.00	0.46	0.46
60:00:00	0.00	0.40	0.40	0.00	0.44	0.44
61:00:00	0.00	0.39	0.39	0.00	0.43	0.43
62:00:00	0.00	0.38	0.38	0.00	0.42	0.42
63:00:00	0.00	0.37	0.37	0.00	0.41	0.41
64:00:00	0.00	0.36	0.36	0.00	0.40	0.40
65:00:00	0.00	0.35	0.35	0.00	0.39	0.39
66:00:00	0.00	0.34	0.34	0.00	0.38	0.38
67:00:00	0.00	0.34	0.34	0.00	0.37	0.37

68:00:00	0.00	0.33	0.33	0.00	0.36	0.36
69:00:00	0.00	0.32	0.32	0.00	0.35	0.35
70:00:00	0.00	0.31	0.31	0.00	0.35	0.35
71:00:00	0.00	0.30	0.30	0.00	0.34	0.34
72:00:00	0.00	0.30	0.30	0.00	0.33	0.33
73:00:00	0.00	0.29	0.29	0.00	0.32	0.32
74:00:00	0.00	0.28	0.28	0.00	0.31	0.31
75:00:00	0.00	0.27	0.27	0.00	0.30	0.30
76:00:00	0.00	0.27	0.27	0.00	0.30	0.30
77:00:00	0.00	0.26	0.26	0.00	0.29	0.29
78:00:00	0.00	0.25	0.25	0.00	0.28	0.28
79:00:00	0.00	0.25	0.25	0.00	0.28	0.28
80:00:00	0.00	0.24	0.24	0.00	0.27	0.27
81:00:00	0.00	0.24	0.24	0.00	0.26	0.26
82:00:00	0.00	0.23	0.23	0.00	0.26	0.26
83:00:00	0.00	0.22	0.22	0.00	0.25	0.25
84:00:00	0.00	0.00	0.00	0.00	0.24	0.24
85:00:00	0.00	0.00	0.00	0.00	0.24	0.24
86:00:00	0.00	0.00	0.00	0.00	0.23	0.23
87:00:00	0.00	0.00	0.00	0.00	0.22	0.22
	4.15	0.88	**4.70**	**5.07**	0.97	5.66

Percentage Diff 7.34%

A5 Hydraulic Modelling Technical Note



Hydraulic Model Technical Note

AEG9224_NG23_NewarkSherwood_03

aegaea
Flood risk, water and environment

Site Address:
Trent Lane
Newark and Sherwood
Nottinghamshire
NG23 7AT

UK Experts in Flood Modelling, Flood Risk Assessments, and Surface Water Drainage Strategies

aegaea
Flood risk, water and environment

Document Issue Record

Project: Hydraulic Model Technical Note

Prepared for: Logika Consultants Ltd

Reference: AEG9224_NG23_NewarkSherwood_03

Site Location: Trent Lane, Newark and Sherwood, Nottinghamshire, NG23 7AT

Revision: Issue_001

Consultant		Date
Author	[redacted]	01/12/2025
Document Check	[redacted]	01/12/2025
Authorisation	[redacted]	02/12/2025

Please Note:

aegaea

Flood risk, water and environment

Table of Contents

1. Introduction

1.1. Aegaea have been commissioned to undertake a hydraulic modelling exercise within the vicinity of a proposed development site at Trent Lane, Newark and Sherwood, Nottinghamshire, NG23 7AT (the ‘Site’). The purpose of the modelling is to simulate the existing Environment Agency (EA) Tidal Trent (2023) model with a design scenario representation of proposed photovoltaic array supports at the Site.

1.2. The Site is split across multiple land parcels to the east and west of the River Trent and covers an area of approximately 1,409 hectares (ha). The Site location is shown in Figure 1 below.

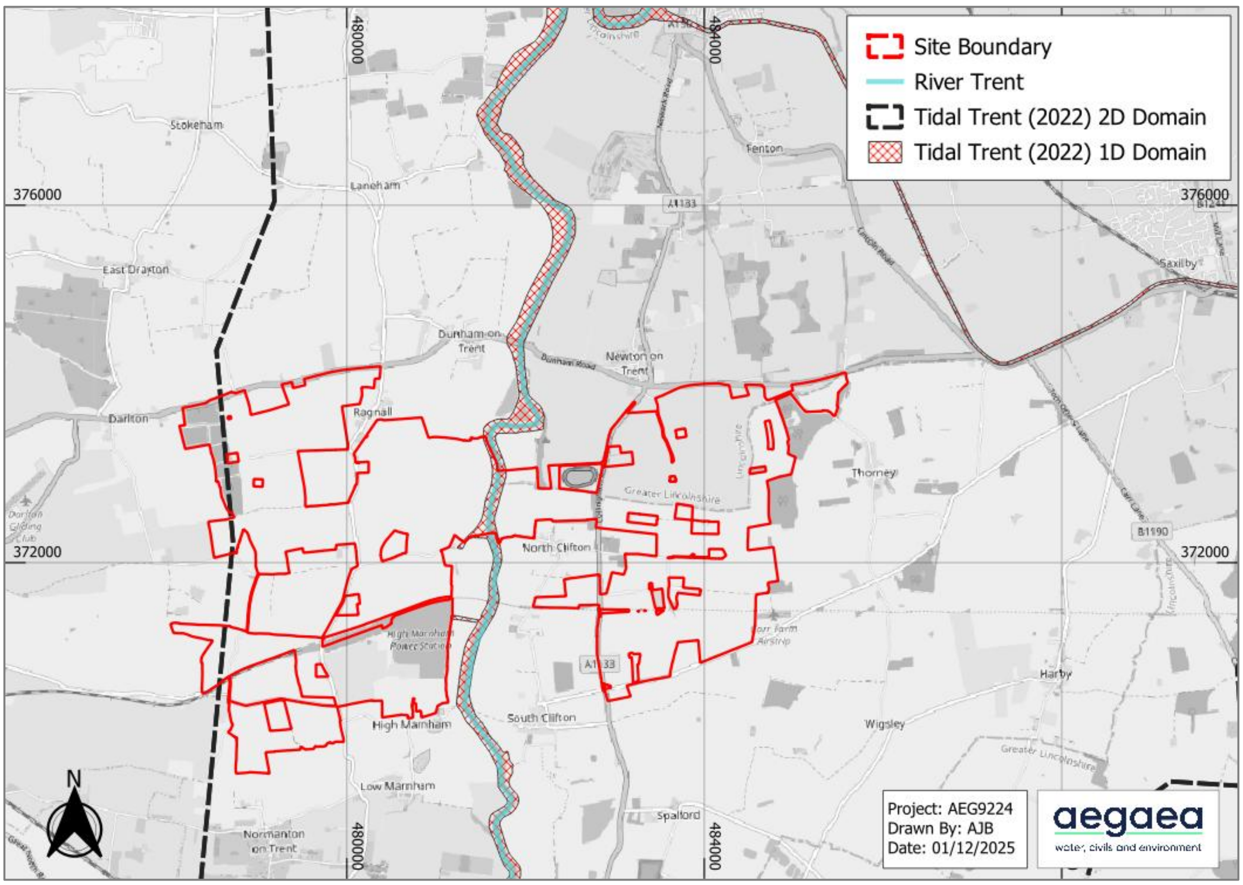


Figure 1: Site Location (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors)

1.3. The Site is located within the domain of the existing EA Tidal Trent (2023) model, shown in Figure 2 below.

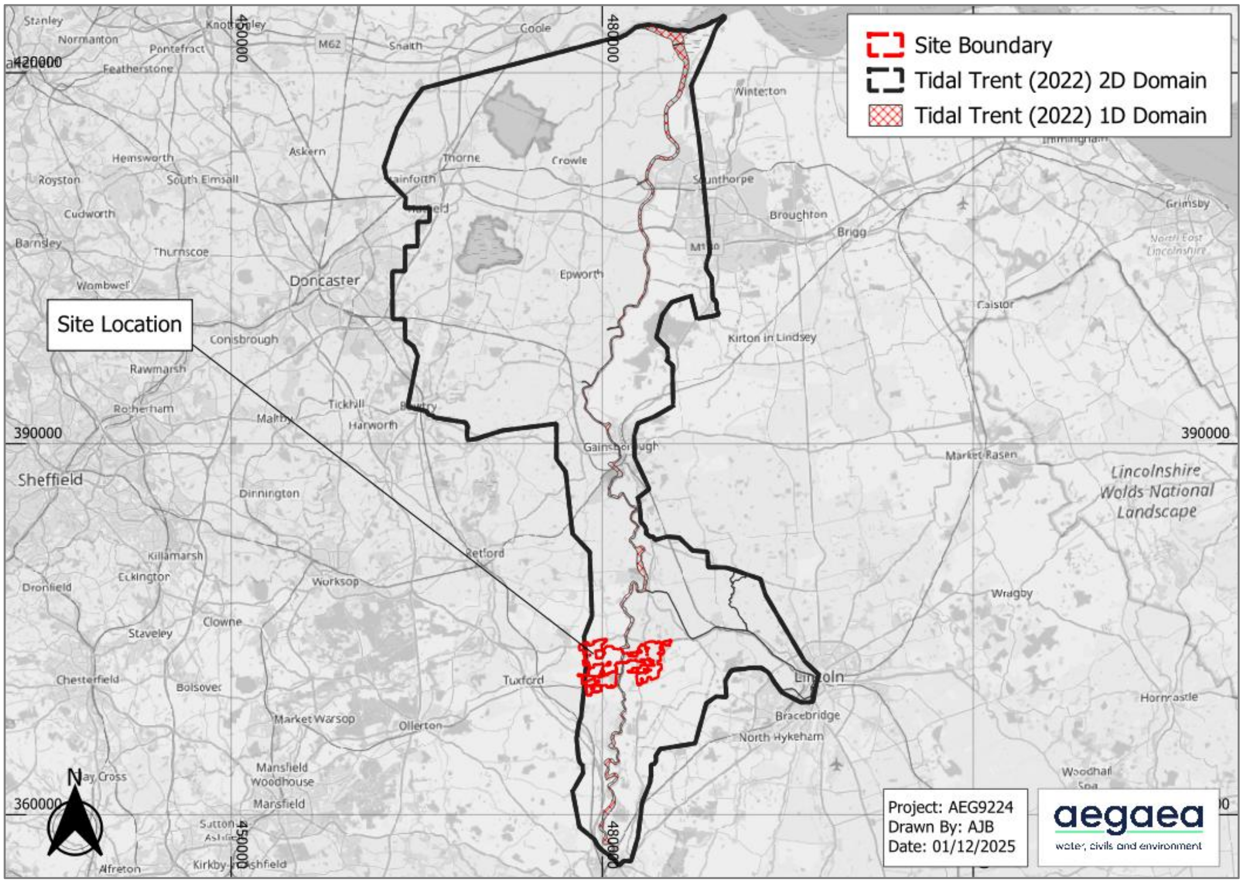


Figure 2: Site Location and Tidal Trent (2023) Model Domain (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors)

Aims and Objectives

1.4. The aim of this exercise is to represent the post development fluvial flooding mechanisms and magnitude within the study area, by simulating the existing EA Tidal Trent (2023) model with the inclusion of site-specific data provided by the client. For clarity, as part of the model review, it is concluded that although there is a slight tidal influence at the Site, fluvial sources are considered to be the dominant source of flooding.

1.5. To achieve this aim, the following objectives have been identified:

- Simulate existing EA Tidal Trent (2023) model on Aegaea Modelling Hardware, with no changes to model schematisation or parameters to verify existing model performance.
- Update the existing 2D domain to include a site-specific representation of photovoltaic array support structures. No other updates shall be made to the model.
- Simulate updated model for the fluvial design flood event.

2. Baseline Model Performance Verification

Aegaea Simulation of EA Tidal Trent (2023) Model

2.1. The EA Tidal Trent (2023) model was provided by the EA as part of a Product 5, 6 and 7 data request. The model input files provided as part of the Product 7 data were extracted onto Aegaea modelling hardware.

2.2. The EA Tidal Trent (2023) model was originally simulated in Flood Modeller Version 5.1.0 linked to TUFLOW 2020-10-AB. In this study, the model was simulated in Flood Modeller Version 7.3.9 linked to TUFLOW 2020-10-AD. At the time of writing, the latest TUFLOW software version is 2025.2.0. However, the EA Tidal Trent model includes the use of 2d_bc point geometry features, which are incompatible with TUFLOW version 2023 and later. Therefore, the use of TUFLOW version 2020 was retained. For accuracy purposes it was deemed appropriate to use a later release of Flood Modeller, rather than the legacy version 5.1.0.

2.3. In order to simulate the existing model on new hardware, file paths were updated in the .ief file. No other changes were made to any simulation files.

2.4. The scenario and event naming convention was retained, which is described below:

SCENARIO_FluvialEvent_TidalEvent

2.5. The EA Tidal Trent (2023) model on Aegaea hardware was simulated for the DEF_F0100_T0002, and DEF_F0100_CC39_T0002 events to allow for a comparison between original and new model outputs.

Maximum Modelled Difference

2.6. Figure 3 and Figure 4 show the maximum modelled depth and extent difference between the original EA Tidal Trent (2023) results and the Aegaea simulated results for the DEF_F0100_CC39_T0002 scenario. Generally, no change (less than +/-0.005m) is observed in the vicinity of the Site and throughout the model domain. Furthermore, no change in flood extent is observed between the two simulations in the vicinity of the Site. This is as expected given the same model input data has been maintained.

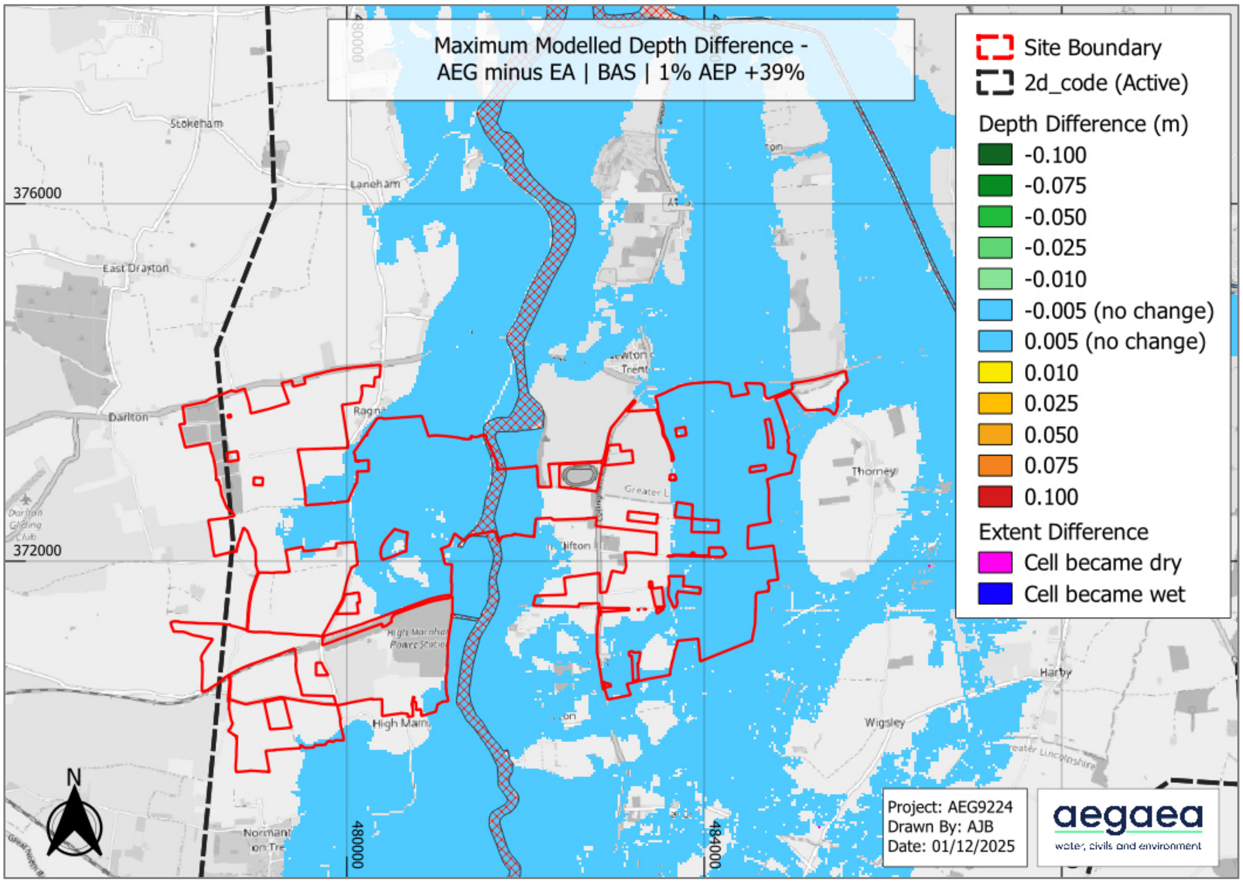


Figure 3: Site Maximum Depth and Extent Difference Map: AEG_TTRENT_2022_DEF_F0100_CC39_T0002_002_d_Max_minus_BAS_EA.asc (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors and EA https://flood-map-for-planning.service.gov.uk/)

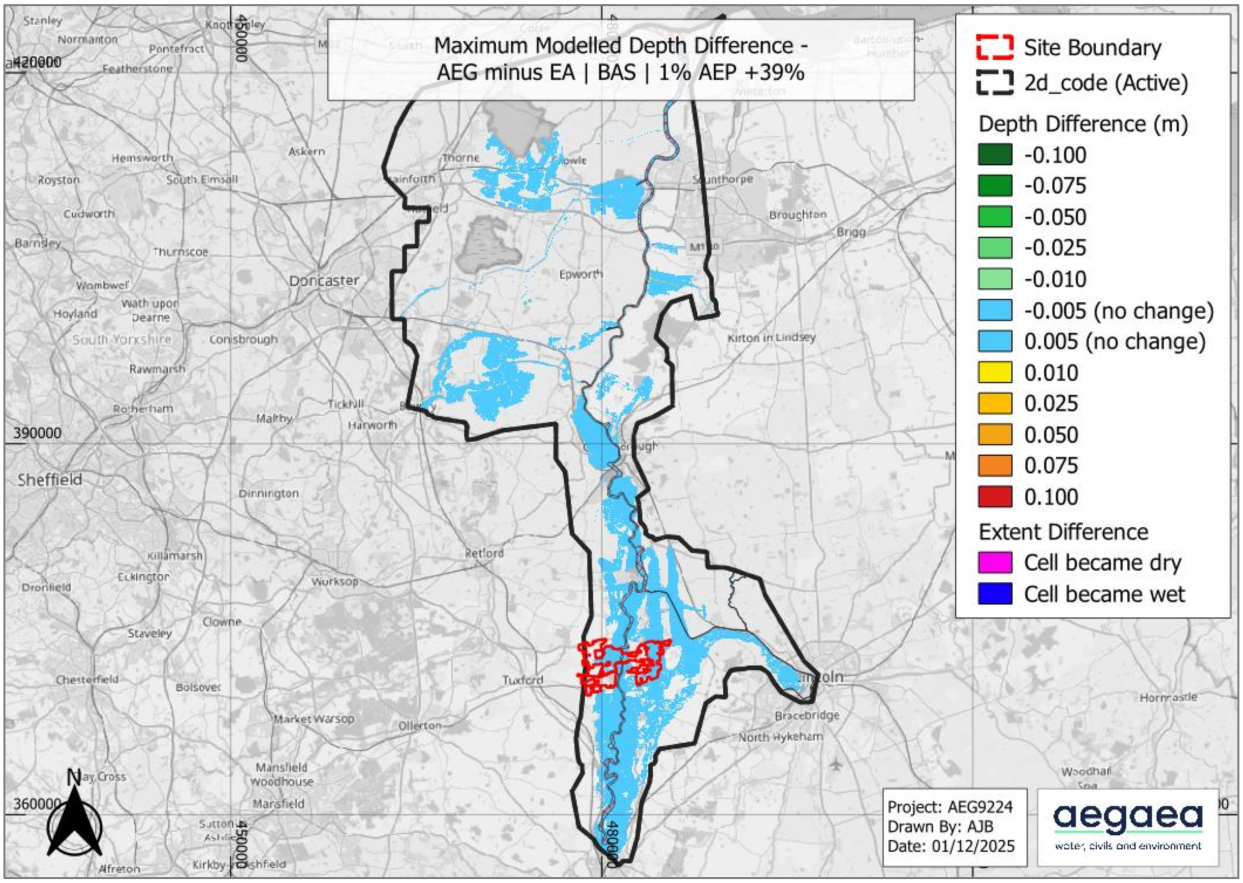


Figure 4: Full Maximum Depth and Extent Difference Map: AEG_TTRENT_2022_DEF_F0100_CC39_T0002_002_d_Max_minus_BAS_EA.asc (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors and EA https://flood-map-for-planning.service.gov.uk/)

2.7. Some minor differences in maximum modelled depth and extent are observed approximately 30km downstream of the Site. The maximum modelled depth difference is -0.141m and +0.081m. However, the scale of difference is so localised as to be insignificant to the Site. Raster layer statistics and a raster histogram have been computed for the depth difference grid which demonstrates the strong correlation in results between the original model and the Aegaea simulation, refer to Figure 5.

2.8. The raster statistics show a mean value of x10^{-5}, indicating that the change values throughout the modelled area are very small on average. This is supported by the raster histogram that shows the distribution of values throughout the depth difference grid falls largely at or close tao 0 indicating predominantly no change, with a small number of values smaller/larger than 0 indicating isolated small changes.

2.9. The results of this comparison exercise provide good justification for moving forward with the Aegaea re-simulated baseline results as the basis for any post-development comparisons.

Table 1: Computed Raster Layer Statistics for Difference Grid:
AEG_TTRENT_2022_DEF_F0100_CC39_T0002_002_d_Max_minus_BAS_EA.asc

Statistic	Value
Minimum value:	-0.141
Maximum value:	0.081
Range:	0.222
Mean value:	$-3.918616538340718 \times 10^{-5}$
Standard deviation:	0.0005881387257144598

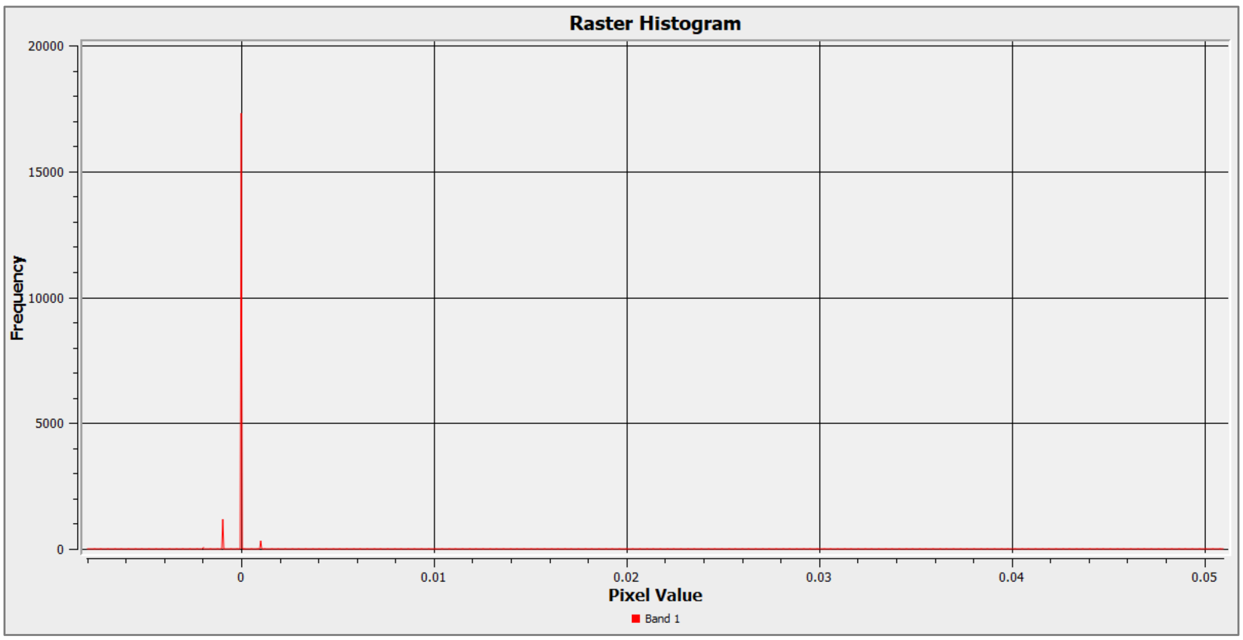


Figure 5: Raster Histogram from depth difference grid:
AEG_BAS_RERUN_minus_TTRENT_2022_DEF_F0100_CC39_T0002_002_d_Max.

3. Design Model Build

Overview

3.1. No changes have been made to the EA Tidal Trent (2023) model files other than the TUFLOW geometry control file (.tgc), in order to include a representation of photovoltaic array support information provided by the client.

3.2. A copy was made of the existing TTRENT_2022_DEF_12.tgc file and the following lines were added:

> *!!AEG9224*
>
> *Read GIS Layered FC Shape == gis\AEG9224\2d_lfcsh_AEG9224_PanelArea_002_R.shp*
>
> *Read GIS SRF == gis\AEG9224\2d_srf_AEG9224_PanelArea_002_R.shp*

3.3. All other parameters and files remained as per the existing model build, including the 2D model grid size of 25m. A better representation of fine scale floodplain features such as photovoltaic supports could be achieved through a reduced grid cell size. However, given the size of the existing Tidal Trent model and the need to balance computational efficiency with accuracy, in combination with the aim of the hydraulic modelling study for comparison purposes only, the relatively coarse grid cell size of 25m has been accepted as a limitation and retained as per the original EA model.

2D Domain

Photovoltaic Supports

3.4. The solar panels themselves are to be raised to be permanently above the design flood level. Therefore, the only part of the array to be represented in this hydraulic modelling study is the solar panel support structures which elevate the panels above the design flood level.

Flow Constriction

3.5. Details and dimensions of typical panel support structures have been provided by the client for inclusion within the hydraulic model. A precautionary approach has been taken whereby the maximum potential cell face area blocked by the supports has been applied as a percentage flow constriction factor to all cell faces within the solar panel array areas. The percentage flow constriction was measured to be 5.16% as a proportion of blocked vs free flowing area from a section view of the typical support structures, based on the typical section shown in Figure 6 below.

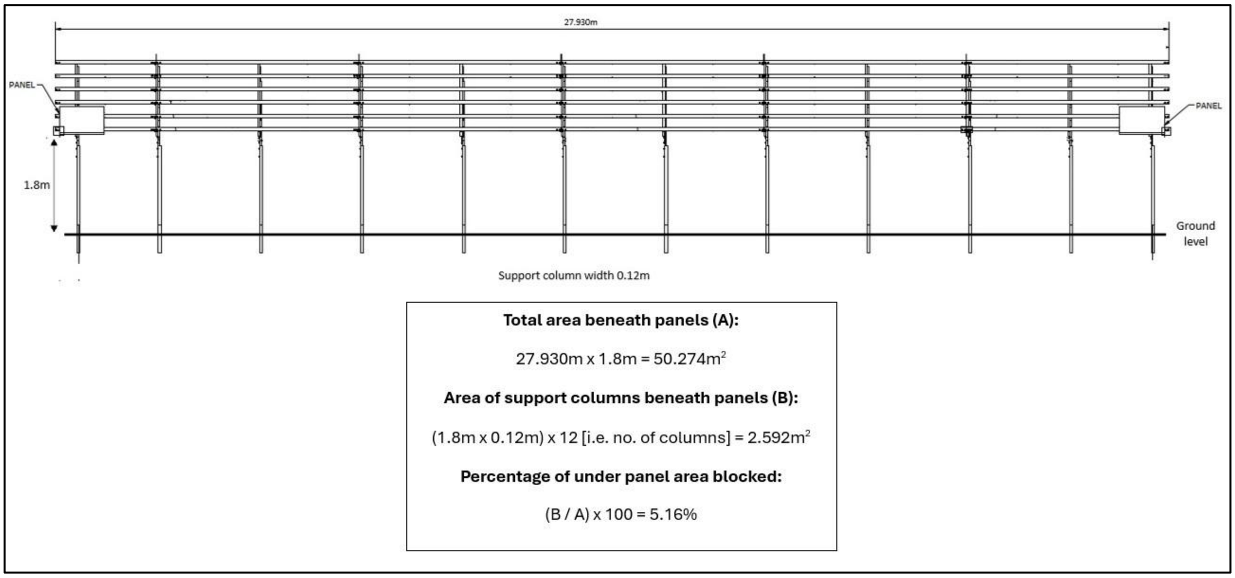


Figure 6: Typical solar panel supports section view and calculations used for % blocked/flow constriction calculations.

3.6. Due to the relatively coarse 25m grid size of the Tidal Trent model, layered flow constriction geometries have been applied over parcels of land rather than individual rows of panels. To account for the gaps between the rows of photovoltaic panels within these areas and to ensure the flow constriction is not overestimated, the percentage flow constriction was reduced relative to the size of the unoccupied space between rows of panels. From a plan view, the width of a standard solar panel row is measured to be 7.0m with a 3.0m gap between rows. Therefore, for a 10.0m section of land, 3.0m (i.e. 30%) of this space is unobstructed, with the other 7.0m (i.e. 70%) occupied by panels with panel support structures. To account for this unobstructed space within the flow constriction feature, the percentage blockage value was reduced by 30% from 5.16% to 3.612%.

3.7. The 2d_lfcsh geometries are shown in Figure 7 below.

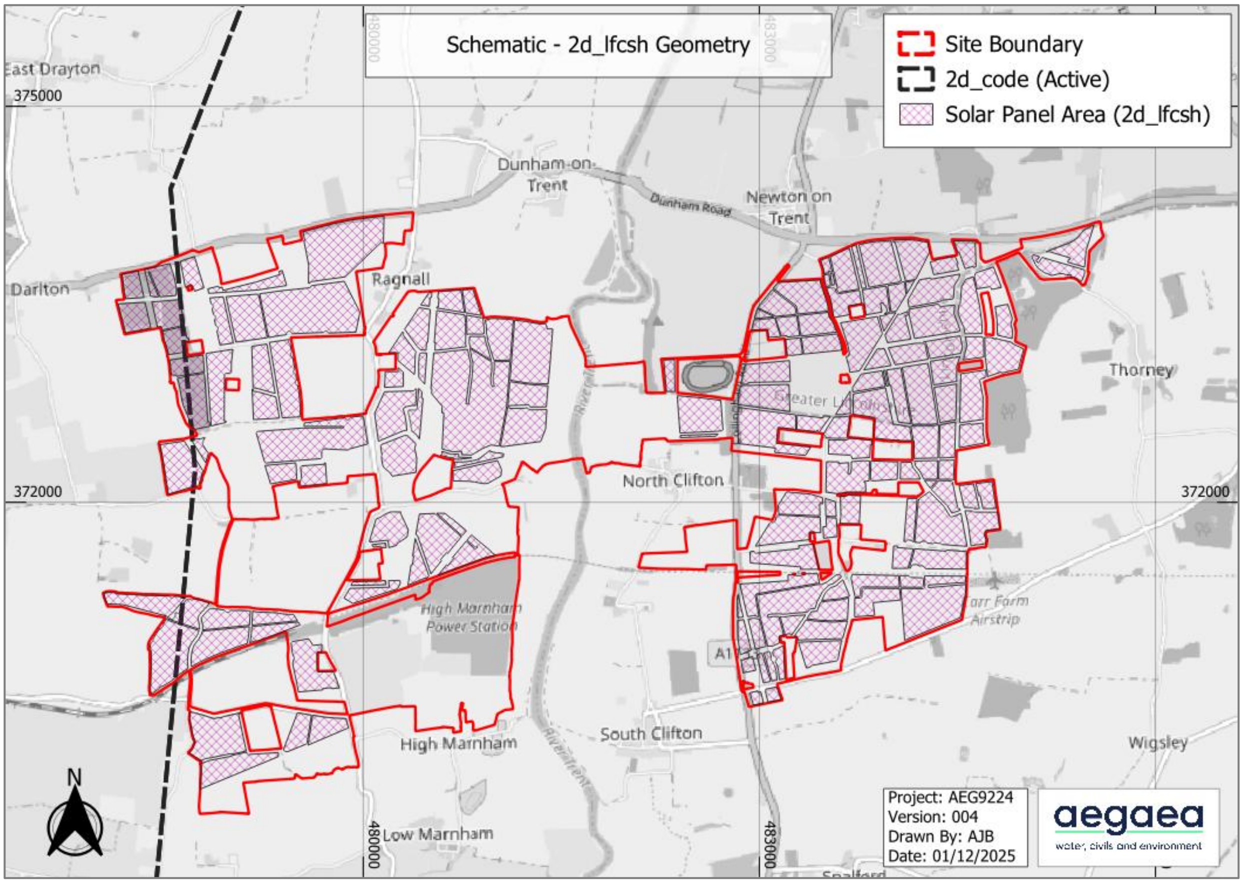


Figure 7: 2d_lfcsh 3.612% flow blockage (panel supports only)

Storage Reduction Factor

3.8. In addition to the flow constriction layer, a storage reduction factor was also applied to account for the displacement of floodwater within each grid cell occupied by the solar panel supports. A cross-section of the vertical supports shows they have a plan area percentage per ha of 0.075% (Figure 8). Therefore, a 0.00075 storage reduction factor has been applied at the solar panel locations.

	Regular Support
Dimensions	120mm x 70mm
Distance to centers (table configuration)	2.5m x 2.54m
Cross Sectional Area (CSA) (m2)	0.0084
Supports per table	32
Table Length Estimate (m)	40
Support CSA per table (m2)	0.2688
Tables per hectacre (in solar area, exc. Buffers/etc)	28
CSA per hectacre (m2)	7.5
CSA per hectacre (%)	0.075%

Figure 8: Cross section through vertical support calculations (solar panel supports)

3.9. It should be noted that the representation of ground levels and 2D domain features throughout the model domain and at the Site is quite coarse, with a grid cell size of 25m. Grid cell size is a fundamental model parameter that can have wide ranging effects on model performance, stability and outputs. To ensure a good correspondence between the original and updated EA Tidal Trent model, the 25m grid cell size has been deemed an acceptable limitation for comparison purposes.

Design Events

3.10. The model was simulated for the following events described in Table 2.

Table 2: Design Events Simulated

Scenario	Fluvial Event	Tidal Event
DEF	F0100_CC39	T0002

5. Fluvial Model Results

Defended Fluvial Model Results – Design

5.1. Figure 9 and Figure 10 show the maximum modelled depth difference for the defended design scenario fluvial event simulation compared to the baseline / predevelopment conditions.

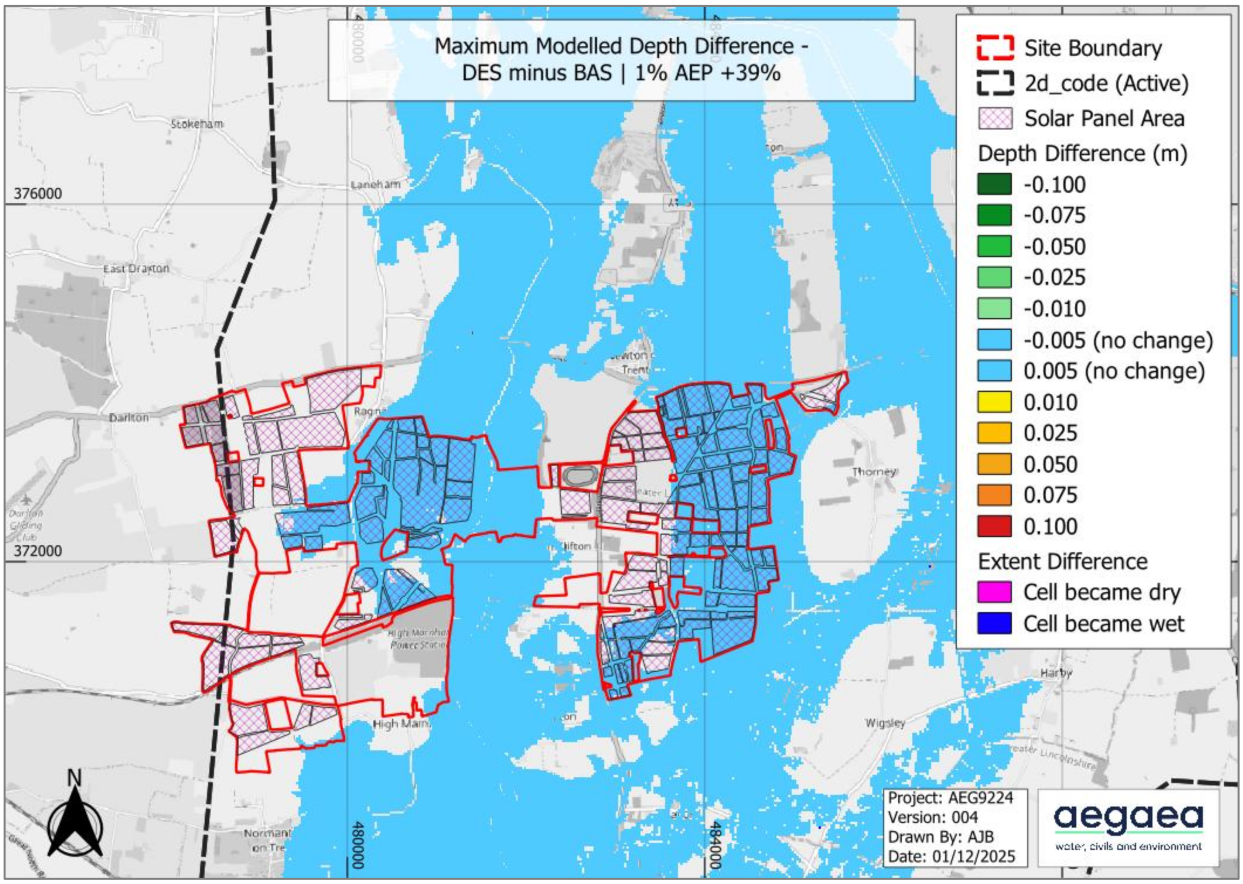


Figure 9: Site Defended Fluvial Design Maximum Flood Extent: DEF_F0100_CC39_T0002 (Base map: OpenStreetMap © https://www.openstreetmap.org and contributors. Ordnance Survey licence number 100024198).

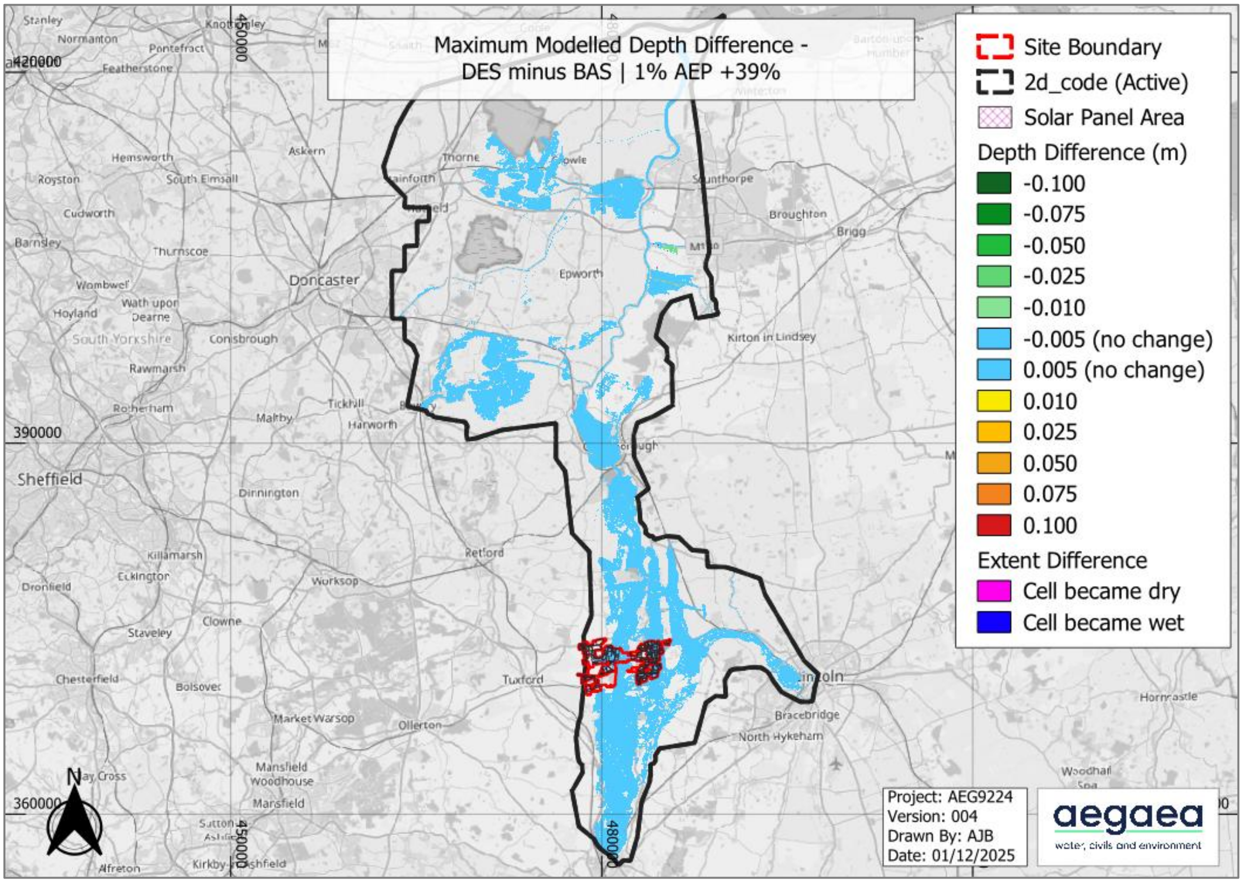


Figure 10: Full Defended Fluvial Design Maximum Flood Extent: DEF_F0100_CC39_T0002 (Base map: OpenStreetMap © https://www.openstreetmap.org and contributors. Ordnance Survey licence number 100024198).

Summary of Design Model Results

5.2. A post development representation of photovoltaic panel supports has been established. When compared with the baseline results, the design proposals are shown to have a negligible impact on maximum flood depths in the vicinity of the site (less than +/-0.005m, i.e. 5mm). However, some single grid cell instances of increased flood extent are noted, these are generally located within the Site boundary. Some isolated occurrences of a single grid cell increase in extent outside of the Site boundary in the vicinity of the development proposals is observed.

5.3. Approximately 30km downstream of the Site, an area of reduced flood depth is observed on the east bank of the River Trent. This is expected to be a result of different levels of non-convergence reported between the 1D and 2D domains between simulations and not as a result of the development proposals. This is further supported by the EA versus Aegaea re-simulated baseline conditions which identified differences in maximum modelled depth and extent in this same location approximately 30km downstream of the Site, with no development proposals simulated. There is no propagation of impacts from the development proposals at the Site towards this isolated depth difference observed. It is therefore considered to be an isolated, localised difference resulting from varying model performance and fluctuating stability in this location.

5.4. The depth difference mapping provided in this report shows a difference of less than +/- 0.005m as insignificant (no change) for clarity of reporting and figures. Any significance thresholds are to be determined by the EA as the Statutory Consultee.

6. Conclusions

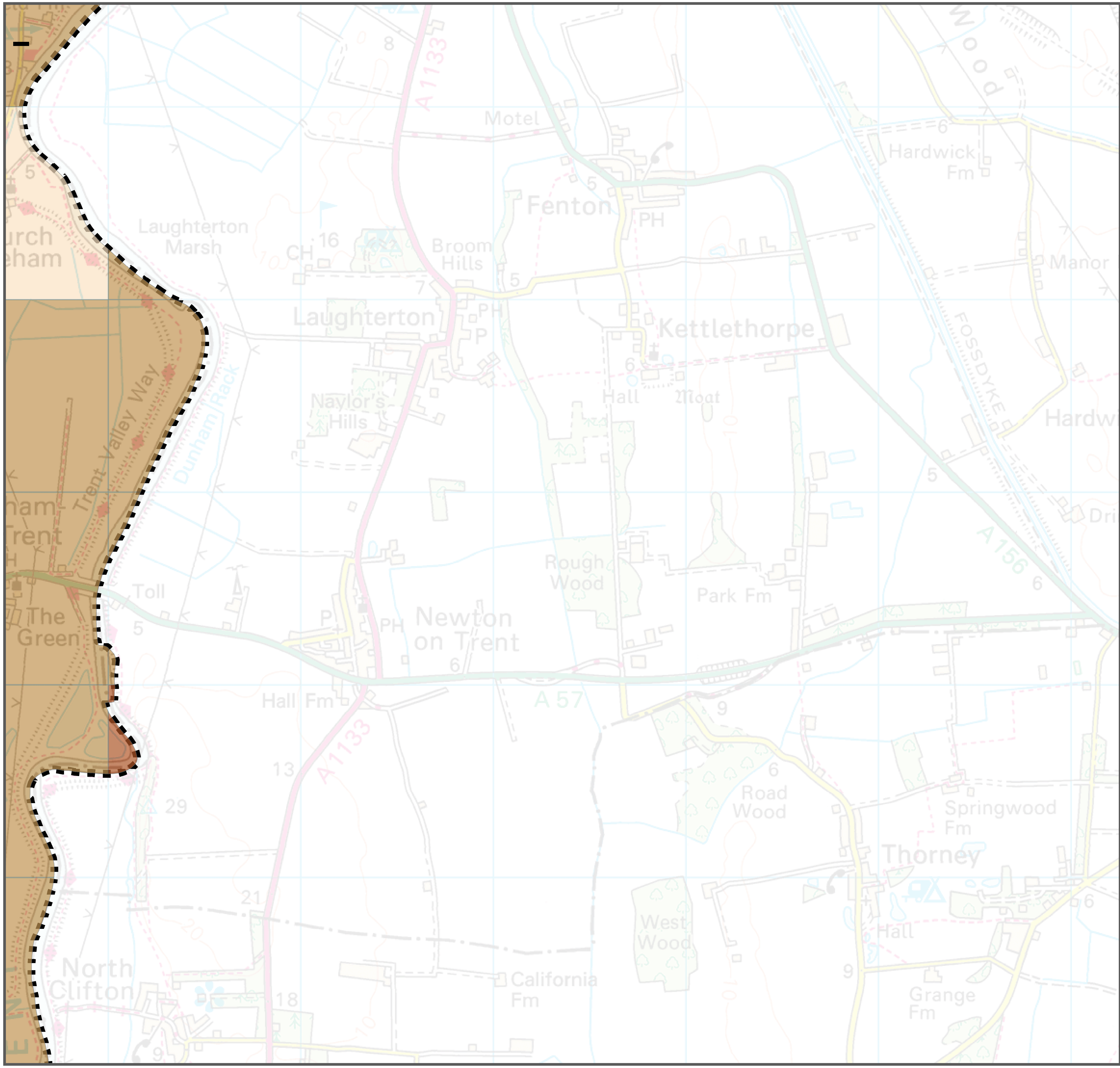
6.1. The EA Tidal Trent (2023) model has been simulated on Aegaea modelling hardware, a strong correlation in results between the original model and the Aegaea simulation has been achieved.

6.2. The EA Tidal Trent model was updated to include a site-specific representation of the proposed photovoltaic array support structures based on information provided by the client. No other updates were made to the model. To ensure a good correspondence between the original and updated EA Tidal Trent model, the 25m grid cell size has been deemed an acceptable limitation for comparison purposes.

6.3. When compared with the baseline results, the design proposals are shown to have a negligible impact on maximum flood depths in the vicinity of the Site (less than +/-0.005m, i.e. 5mm). However, some single grid cell instances of increased flood extent are noted, these are generally located within the Site boundary. Some isolated occurrences of a single grid cell increase in extent outside of the Site boundary in the vicinity of the development proposals is observed.

6.4. This technical note outlines the aims, methods and outputs from the Post Development Hydraulic Modelling Study at the Site at Trent Lane, Newark and Sherwood, Nottinghamshire, NG23 7AT. The use of site-specific post development data provides a robust set of design conditions for use in assessing any potential impacts resulting from the development proposals.

A6 Susceptibility to Groundwater Flooding SFRA Mapping



Notes

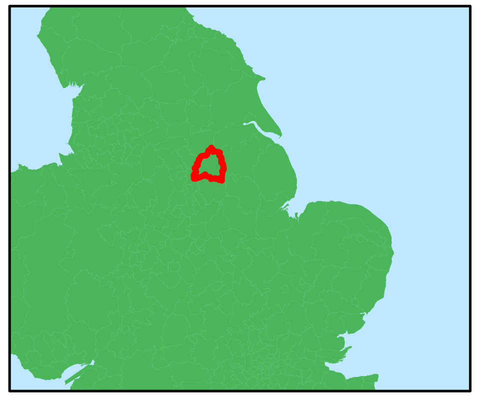
The Areas Susceptible to Groundwater Flooding (AStGWF) is a strategic scale map showing groundwater flood areas on a 1km square grid. The data was produced to annotate indicative Flood Risk Areas for Preliminary Flood Risk Assessment (PFRA) studies and allow the Lead Local Flood Authorities (LLFAs) to determine whether there may be a risk of flooding from groundwater.

This data shows the proportion of each 1km grid square where geological and hydrogeological condition show that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring. It does not take account of the chance of flooding from groundwater rebound. This dataset covers a large area of land, and only isolated locations within the overall susceptible area are actually likely to suffer the consequences of groundwater flooding.

The AStGWF data should be used only in combination with other information, for example local data or historic data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale. However, the data can help to identify areas for assessment at a local scale where finer resolution datasets exist.

For up to date information on the suite of flood maps please refer to the Environment Agency website: http://apps.environment-agency.gov.uk/wiyby/

Key Plan



Legend

Bassetlaw District Boundary

Areas Susceptable to Groundwater Flooding

< 25%

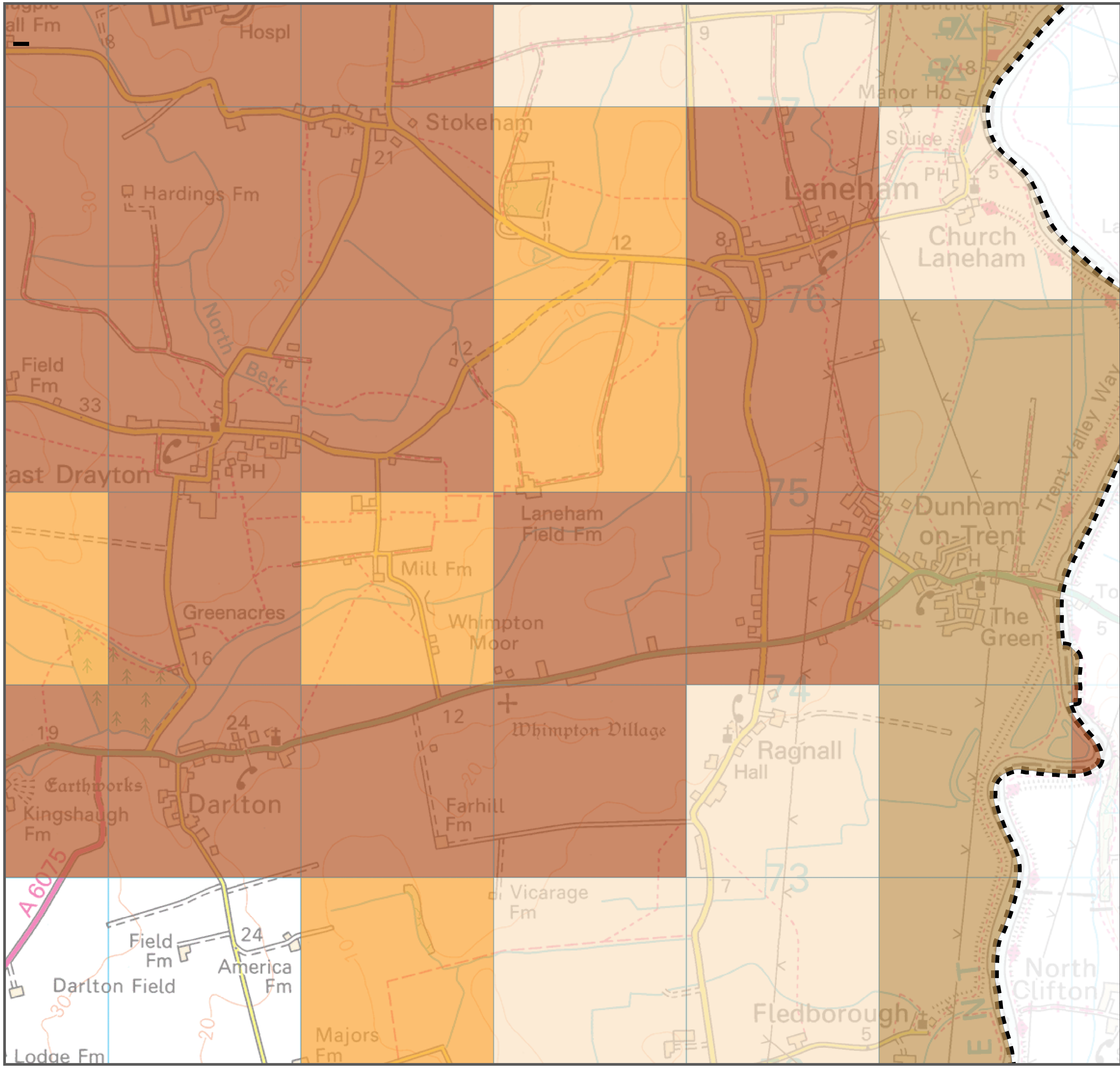
>= 50% <75%

>= 75%

0 50 100 200 300 400 500 km

STRATEGIC FLOOD RISK ASSESSMENT LEVEL 1

APPENDIX E - GROUND WATER MAPPING



Notes

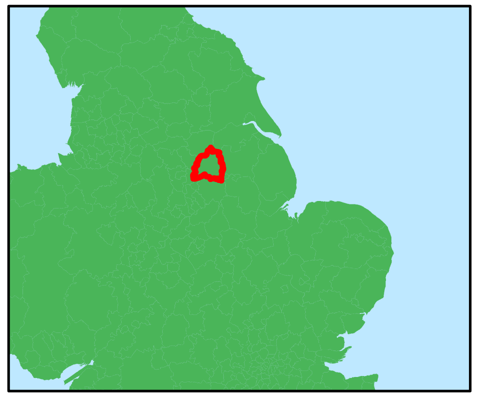
The Areas Susceptible to Groundwater Flooding (AStGWF) is a strategic scale map showing groundwater flood areas on a 1km square grid. The data was produced to annotate indicative Flood Risk Areas for Preliminary Flood Risk Assessment (PFRA) studies and allow the Lead Local Flood Authorities (LLFAs) to determine whether there may be a risk of flooding from groundwater.

This data shows the proportion of each 1km grid square where geological and hydrogeological condition show that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring. It does not take account of the chance of flooding from groundwater rebound. This dataset covers a large area of land, and only isolated locations within the overall susceptible area are actually likely to suffer the consequences of groundwater flooding.

The AStGWF data should be used only in combination with other information, for example local data or historic data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale. However, the data can help to identify areas for assessment at a local scale where finer resolution datasets exist.

For up to date information on the suite of flood maps please refer to the Environment Agency website: http://apps.environment-agency.gov.uk/wiyby/

Key Plan



Legend

Bassetlaw District Boundary

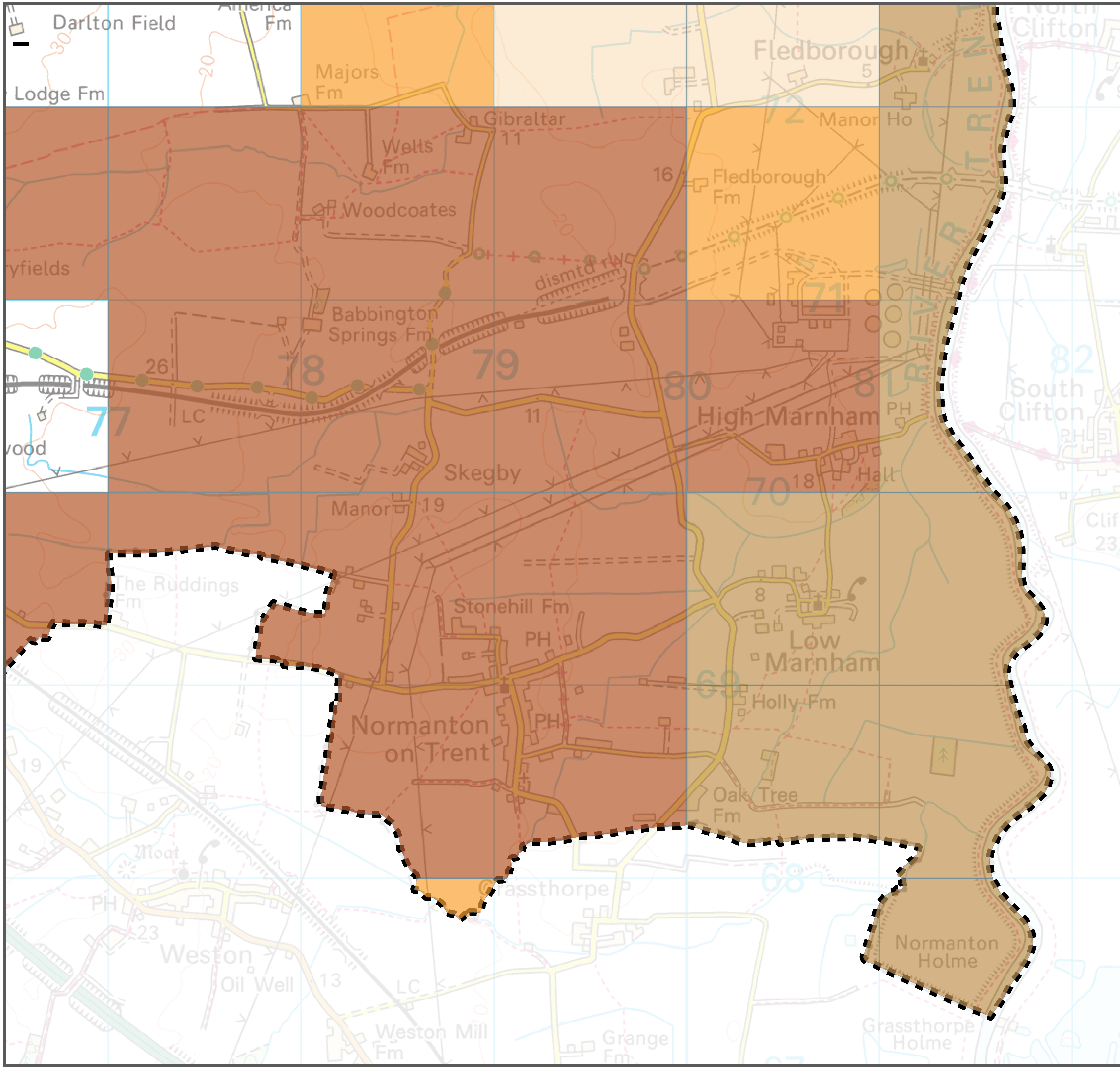
Areas Susceptable to Groundwater Flooding

- < 25%
- >= 25% <50%
- >= 50% <75%
- >= 75%

0 50 100 200 300 400 500 km

STRATEGIC FLOOD RISK ASSESSMENT LEVEL 1

APPENDIX E - GROUND WATER MAPPING



Notes

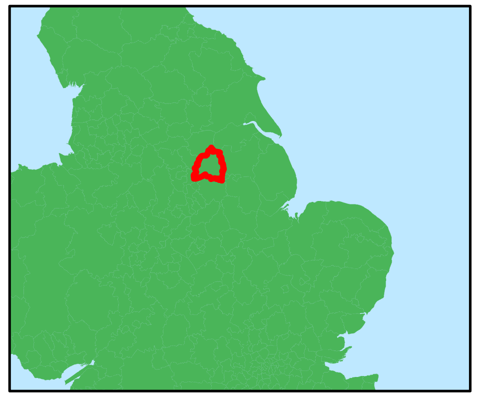
The Areas Susceptible to Groundwater Flooding (AStGWF) is a strategic scale map showing groundwater flood areas on a 1km square grid. The data was produced to annotate indicative Flood Risk Areas for Preliminary Flood Risk Assessment (PFRA) studies and allow the Lead Local Flood Authorities (LLFAs) to determine whether there may be a risk of flooding from groundwater.

This data shows the proportion of each 1km grid square where geological and hydrogeological condition show that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring. It does not take account of the chance of flooding from groundwater rebound. This dataset covers a large area of land, and only isolated locations within the overall susceptible area are actually likely to suffer the consequences of groundwater flooding.

The AStGWF data should be used only in combination with other information, for example local data or historic data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale. However, the data can help to identify areas for assessment at a local scale where finer resolution datasets exist.

For up to date information on the suite of flood maps please refer to the Environment Agency website: http://apps.environment-agency.gov.uk/wiyby/

Key Plan



Legend

Bassetlaw District Boundary

Areas Susceptable to Groundwater Flooding

- < 25%
- >= 25% <50%
- >= 50% <75%
- >= 75%

0 50 100 200 300 400 500 km

STRATEGIC FLOOD RISK ASSESSMENT LEVEL 1

APPENDIX E - GROUND WATER MAPPING

A7 FEH Point Data

Point data at 479513,372589

Point: 479513,372589

Tag: One Earth - Point Data 2

Rainfall Export

Descriptor	Value
NGR	SK 79513 72589
BFIHOST	0.513
BFIHOST19	0.491
PROPWET	0.24
SAAR6190	588 mm

Point data at 483388,372857

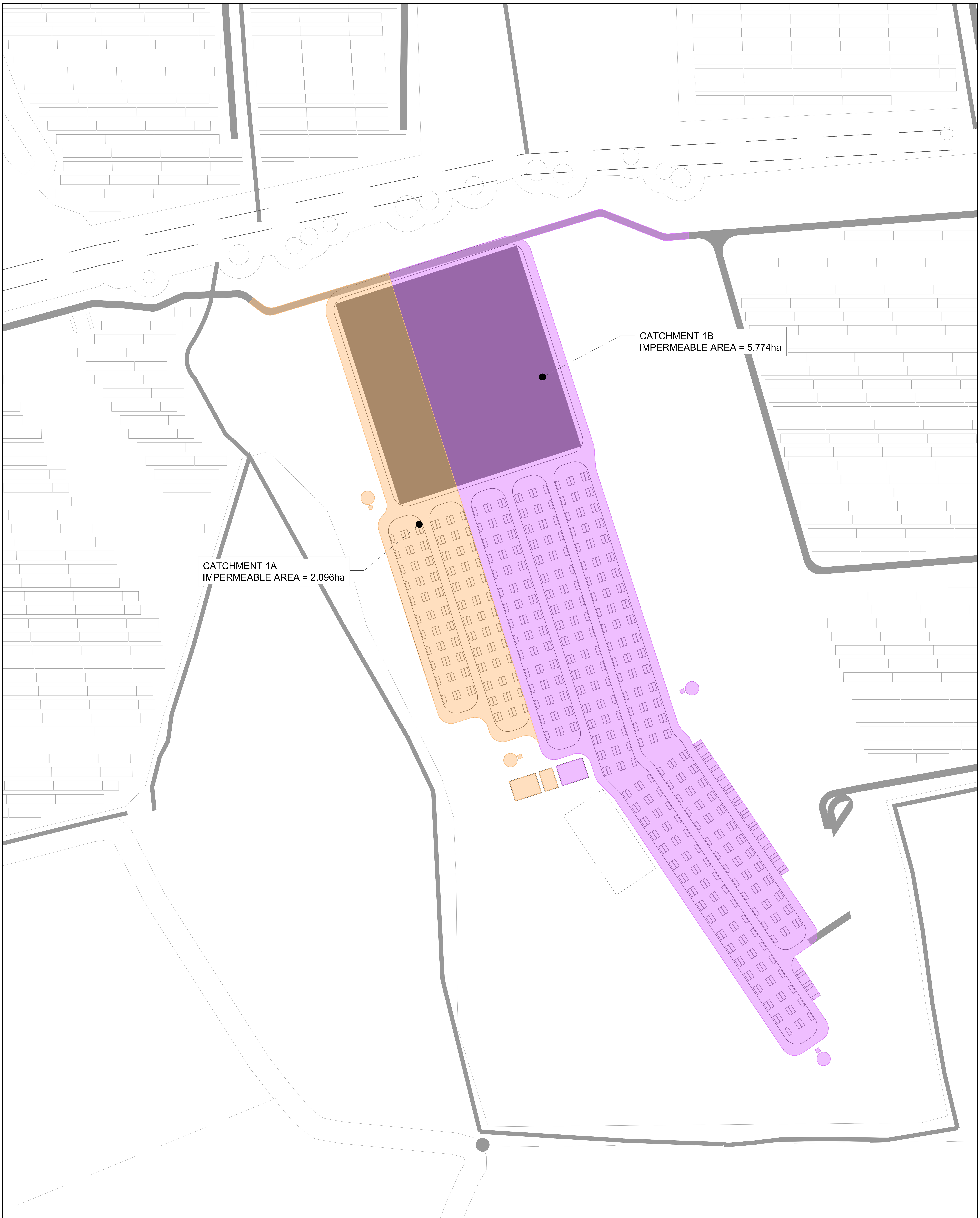
Point: 483388,372857

Tag: One earth - Point Data 3

Rainfall Export

Descriptor	Value
NGR	SK 83388 72857
BFIHOST	0.526
BFIHOST19	0.58
PROPWET	0.24
SAAR6190	587 mm

A8 Surface Water Drainage Strategy Plan



one earth
solar farm

Client:
One Earth Solar Farm Ltd

Project:
One Earth Solar Farm

Planning Inspectorate Scheme Ref:EN010159

Environmental Statement Volume 2

Drawing Title:
Catchment Plan
Western BESS Compound

Project:	Rev.
EN01015/APP/2.6 #1	03

Drawn: ST	Designed: ST	Approved: CT

Drawing Date:	Scale:
2025-02-19	1:1250

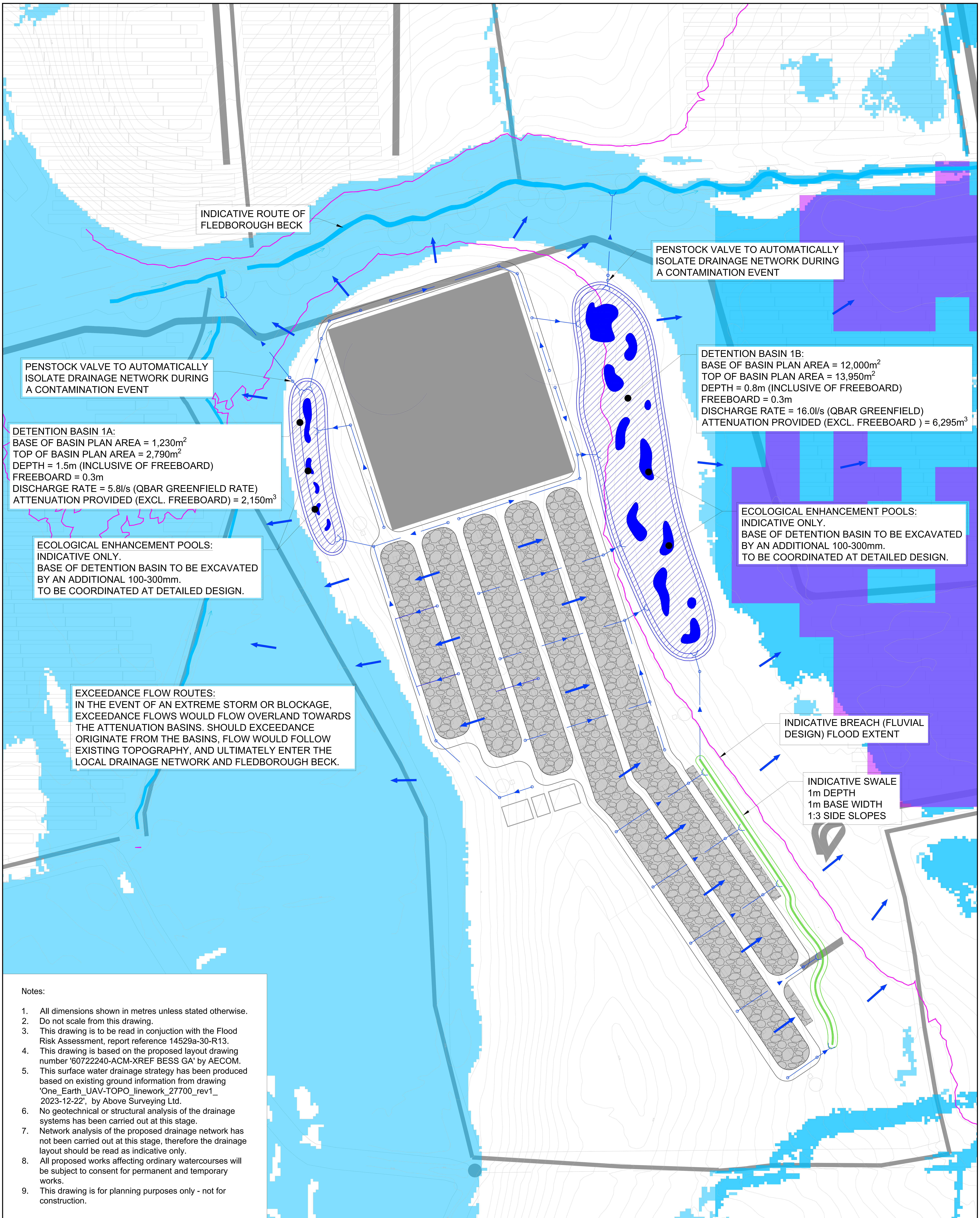
Legend

Catchment 1A

Catchment 1B

Notes:

1. All dimensions shown in metres unless stated otherwise.
2. Do not scale from this drawing.
3. This drawing is to be read in conjuction with the Flood Risk Assessment, report reference 14529A-30-R13.
4. This drawing is based on the proposed layout drawing number '60722240-ACM-XREF BESS GA' by AECOM.
5. This catchment plan has been produced based on existing ground information from drawing 'One_Earth_UAV-TOPO_linework_27700_rev1_2023-12-22', by Above Surveying Ltd.
6. Network analysis of the proposed drainage network has not been carried out at this stage, therefore the drainage layout should be read as indicative only.
7. All proposed works affecting ordinary watercourses will be subject to consent for permanent and temporary works.
8. This drawing is for planning purposes only - not for construction.



Notes:

1. All dimensions shown in metres unless stated otherwise.
2. Do not scale from this drawing.
3. This drawing is to be read in conjuction with the Flood Risk Assessment, report reference 14529a-30-R13.
4. This drawing is based on the proposed layout drawing number '60722240-ACM-XREF BESS GA' by AECOM.
5. This surface water drainage strategy has been produced based on existing ground information from drawing 'One_Earth_UAV-TOPO_linework_27700_rev1_ 2023-12-22', by Above Surveying Ltd.
6. No geotechnical or structural analysis of the drainage systems has been carried out at this stage.
7. Network analysis of the proposed drainage network has not been carried out at this stage, therefore the drainage layout should be read as indicative only.
8. All proposed works affecting ordinary watercourses will be subject to consent for permanent and temporary works.
9. This drawing is for planning purposes only - not for construction.

one earth solar farm

Client: One Earth Solar Farm Ltd

Drawing Title: Surface Water Drainage Strategy Western BESS Compound

Project: One Earth Solar Farm

Project: EN01015/APP/2.6 #3

Rev. 04

Drawn: NA/ST | Designed: NA/ST | Approved: CT

Planning Inspectorate Scheme Ref:EN010159

Environmental Statement Volume 2

Drawing Date: 2025-02-19

Scale: 1:1250

Legend

- Modelled fluvial flood extent - 100 yr plus climate change event
- Risk of flooding from surface water - 1000 yr pluvial extent
- Indicative defence breach flood outline
- Indicative ordinary watercourse
- Proposed permeable sub-base
- Proposed attenuation basin
- Proposed ecological enhancement pools
- Proposed surface water sewer & manhole
- Proposed hydrobrake
- Proposed swale
- Exceedance flow routes
- Existing contours (m AOD)

N

Client: One Earth Solar Farm Ltd

Drawing Title: Catchment Plan
Eastern BESS Compound

Project: One Earth Solar Farm

Project: EN01015/APP/2.6 **#2**

Rev. 03

Drawn: ST | Designed ST: | Approved: CT

Planning Inspectorate Scheme Ref:EN010159

Environmental Statement Volume 2

Drawing Date: 2025-02-19

Scale: 1:1250

Legend

- Catchment 2
- Catchment 3

Notes:

1. All dimensions shown in metres unless stated otherwise.
2. Do not scale from this drawing.
3. This drawing is to be read in conjuction with the Flood Risk Assessment, report reference 14529a-30-R13.
4. This drawing is based on the proposed layout drawing number '60722240- ACM-XREF BESS GA' by AECOM.
5. This catchment plan has been produced based on existing ground information from drawing 'One_Earth_UAV-TOPO_ linework_27700_rev1_2023-12-22', by Above Surveying Ltd.
6. Network analysis of the proposed drainage network has not been carried out at this stage, therefore the drainage layout should be read as indicative only.
7. All proposed works affecting ordinary watercourses will be subject to consent for permanent and temporary works.
8. This drawing is for planning purposes only - not for construction.

one earth solar farm

Client: One Earth Solar Farm Ltd

Drawing Title: Surface Water Drainage Strategy Eastern BESS Compound

Project: One Earth Solar Farm

Project: EN01015/APP/2.6 #4

Rev.: 05

Drawn: NA/ST | Designed: NA/ST | Approved: CT

Planning Inspectorate Scheme Ref:EN010159

Environmental Statement Volume 2

Drawing Date: 2025-02-19

Scale: 1:1250

Legend

- Modelled fluvial flood extent - 100 yr plus climate change event
- Risk of flooding from surface water - 1000 yr pluvial extent
- Indicative ordinary watercourse
- Proposed permeable sub-base
- Proposed attenuation basin
- Proposed ecological enhancement pools
- Proposed surface water sewer & manhole
- Proposed hydrobrake
- Proposed swale
- Exceedance flow routes
- Existing contours (m AOD)

Notes:

1. All dimensions shown in metres unless stated otherwise.
2. Do not scale from this drawing.
3. This drawing is to be read in conjuction with the Flood Risk Assessment, report reference 14529a-30-R13.
4. This drawing is based on the proposed layout drawing number '60722240-ACM-XREF BESS GA' by AECOM.
5. This surface water drainage strategy has been produced based on existing ground information from drawing 'One_Earth_UAV-TOPO_linework_27700_rev1_2023-12-22', by Above Surveying Ltd.
6. No geotechnical or structural analysis of the drainage systems has been carried out at this stage.
7. Network analysis of the proposed drainage network has not been carried out at this stage, therefore the drainage layout should be read as indicative only.
8. All proposed works affecting ordinary watercourses will be subject to consent for permanent and temporary works.
9. This drawing is for planning purposes only - not for construction.

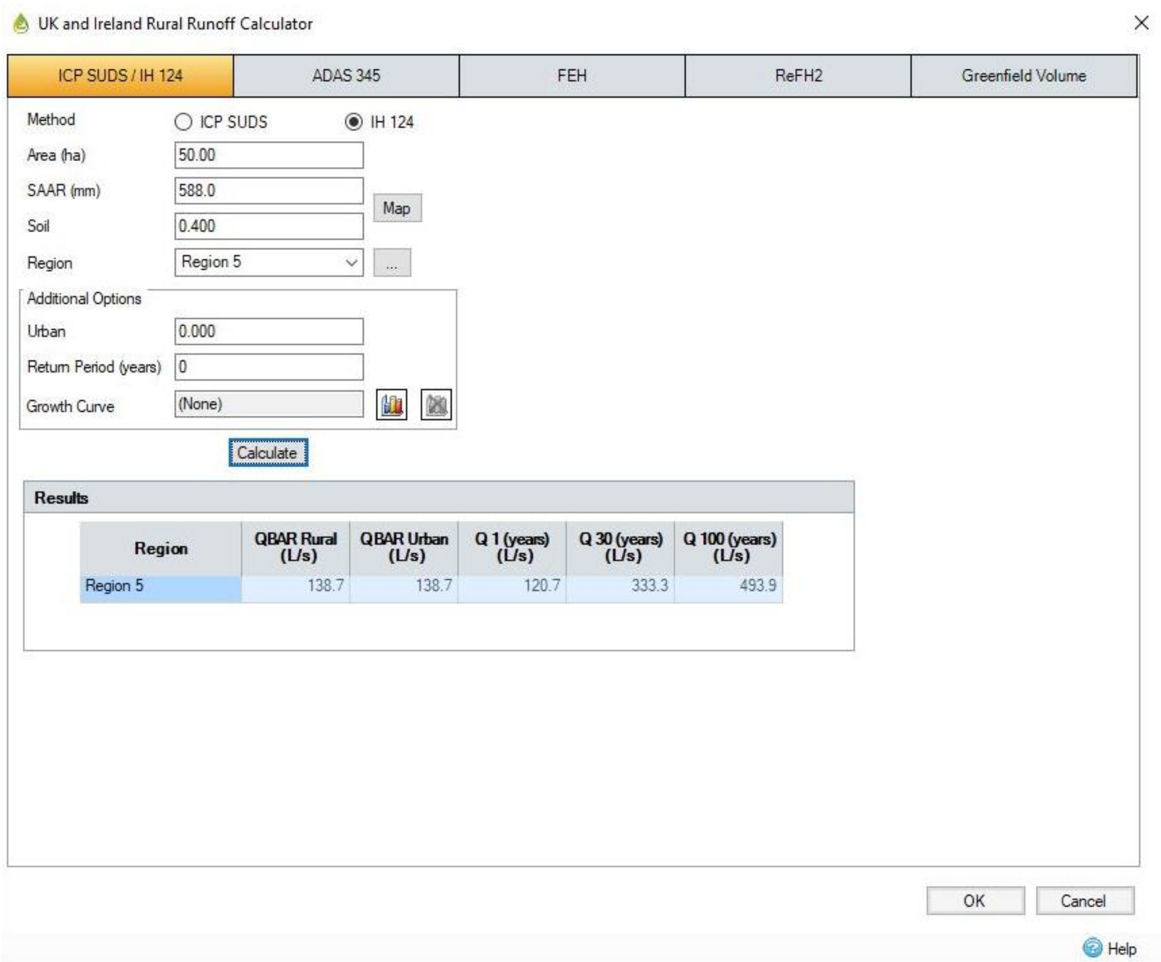
A9 Surface Water Drainage Calculations

A9.1 Greenfield Runoff Rates

Greenfield Surface Water Calculations
IoH124

Project:	One Earth Solar Farm	Calculated: S.Thorpe	Date: 20/02/2025
Project Number:	14529A	Checked: C.Thwaites	Date: 20/02/2025

Notes	Western BESS Compound



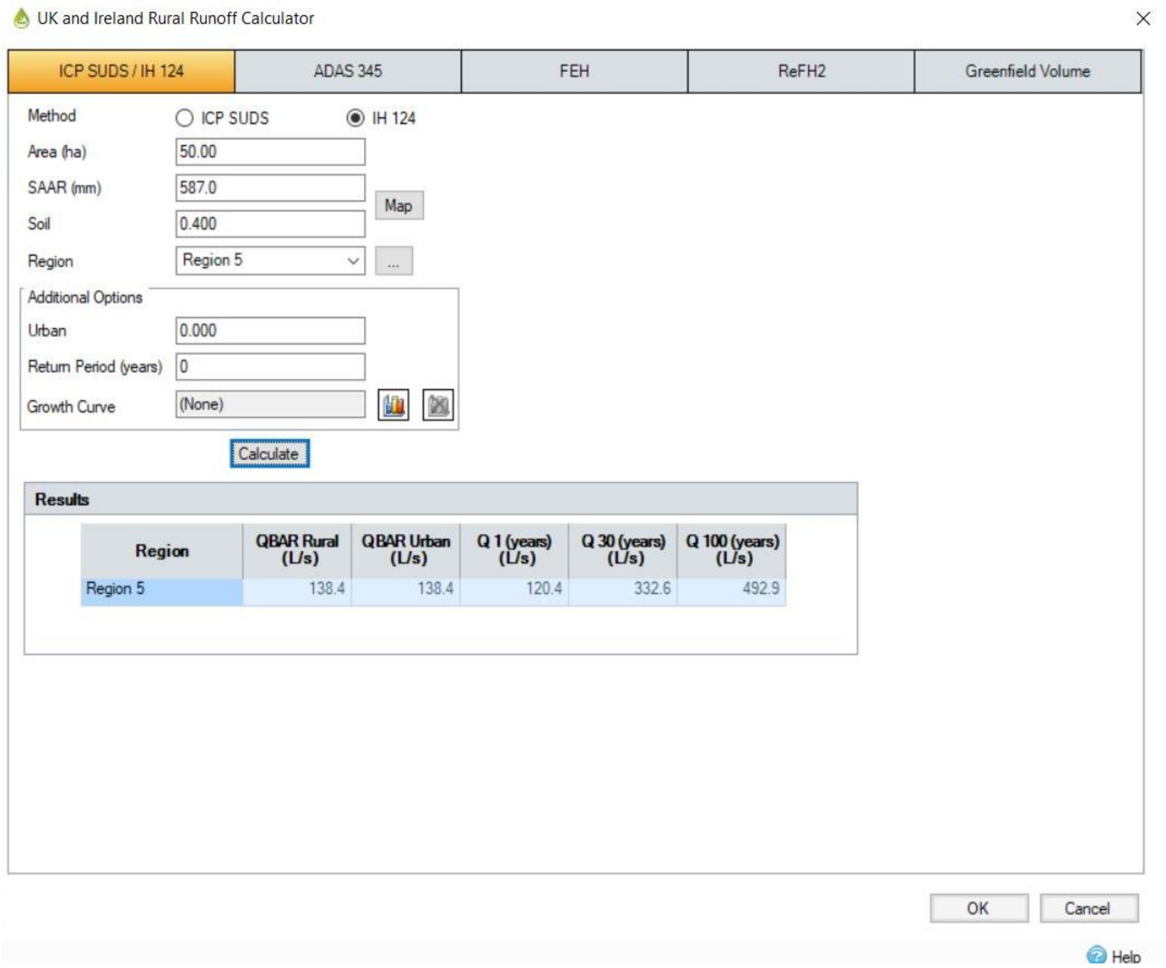
IoH124 Runoff		
Storm Event	**l / s / 50ha**	**l / s / ha**
QBAR	138.7	2.77
1 in 1	120.7	2.41
1 in 30	333.3	6.67
1 in 100	493.9	9.88

Western BESS IoH124 Runoff		
Catchment	**Impermeable Area (ha)**	**QBAR Greenfield Rate (l /s)**
1A	2.096	5.8
1B	5.774	16.0

Greenfield Surface Water Calculations
IoH124

Project:	One Earth Solar Farm	Calculated: S.Thorpe	Date: 20/02/2025
Project Number:	14529A	Checked: C.Thwaites	Date: 20/02/2025

Notes	Eastern BESS Compound



IoH124 Runoff		
Storm Event	**l / s / 50ha**	**l / s / ha**
QBAR	138.4	2.77
1 in 1	120.4	2.41
1 in 30	332.6	6.65
1 in 100	492.9	9.86

Eastern BESS IoH124 Runoff		
Catchment	**Impermeable Area (ha)**	**QBAR Greenfield Rate (l /s)**
2	4.539	12.6
3	2.781	7.7

A9.2 Normal Conditions

Catchment Area 2

Type : Catchment Area

Area (ha)	4.539

Preliminary Sizing

Volumetric Runoff Coefficient	0.750
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.750
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Catchment Area 3

Type : Catchment Area

Area (ha)	2.781

Preliminary Sizing

Volumetric Runoff Coefficient	0.750
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Pond 2 Type : Pond

Dimensions

Exceedance Level (m)	10.000
Depth (m)	0.900
Base Level (m)	9.100
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.762
Total Volume (m³)	4159.989

Depth (m)	Area (m²)	Volume (m³)
0.000	6516.00	0.000
0.900	7800.00	6433.545

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 2
Bypass Destination	(None)
Capacity Type	No Restriction

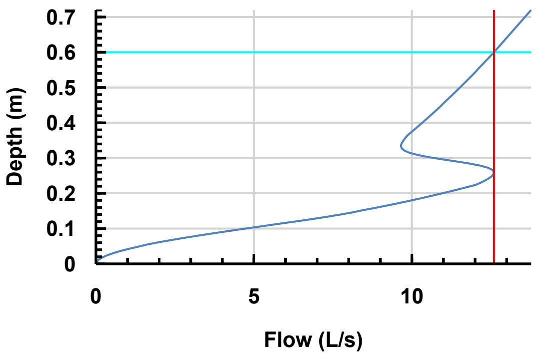
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	9.100
Design Depth (m)	0.600
Design Flow (L/s)	12.6
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0161-1260-0600-1260



Advanced

Perimeter	Circular
Length (m)	223.506
Friction Scheme	Manning's n
n	0.03

Pond 3 Type : Pond

Dimensions

Exceedance Level (m)	10.000
Depth (m)	0.800
Base Level (m)	9.200
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.72
Total Volume (m³)	3024.118

Depth (m)	Area (m²)	Volume (m³)
0.000	5725.90	0.000
0.800	6783.50	4997.788

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 3
Bypass Destination	(None)
Capacity Type	No Restriction

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

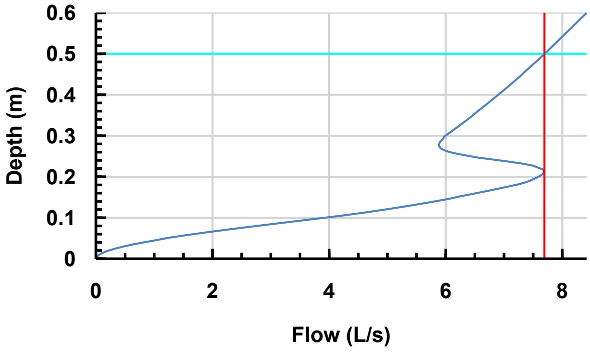
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	9.200
Design Depth (m)	0.500
Design Flow (L/s)	7.7
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0133-7700-0500-7700



Advanced

Perimeter	Circular
Length (m)	224.803
Friction Scheme	Manning's n
n	0.03

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 100 years: Increase Rainfall (%): +40: Summary Results for Pond 2: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +40 %: 15 mins: Summer	9.346	9.316	0.246	0.216	3201.6	1438.543	0.000	0.000	11.7	10.545	2182	65.420	OK
FEH: 100 years: +40 %: 15 mins: Winter	9.343	9.317	0.243	0.217	3012.1	1439.079	0.000	0.000	11.7	10.504	2167	65.407	OK
FEH: 100 years: +40 %: 30 mins: Summer	9.378	9.379	0.278	0.279	2171.2	1870.704	0.000	0.000	12.5	28.740	3424	55.031	OK
FEH: 100 years: +40 %: 30 mins: Winter	9.378	9.379	0.278	0.279	2037.7	1870.500	0.000	0.000	12.5	28.761	3380	55.036	OK
FEH: 100 years: +40 %: 60 mins: Summer	9.443	9.444	0.343	0.344	1874.9	2322.551	0.000	0.000	12.5	52.243	3749	44.169	OK
FEH: 100 years: +40 %: 60 mins: Winter	9.444	9.444	0.344	0.344	1507.7	2322.041	0.000	0.000	12.6	52.909	3331	44.182	OK
FEH: 100 years: +40 %: 120 mins: Summer	9.483	9.483	0.383	0.383	1254.0	2599.399	0.000	0.000	12.5	112.499	2383	37.514	OK
FEH: 100 years: +40 %: 120 mins: Winter	9.483	9.483	0.383	0.383	902.4	2597.679	0.000	0.000	12.5	114.226	2175	37.556	OK
FEH: 100 years: +40 %: 180 mins: Summer	9.507	9.507	0.407	0.407	949.8	2767.442	0.000	0.000	12.6	175.957	2232	33.475	OK
FEH: 100 years: +40 %: 180 mins: Winter	9.507	9.507	0.407	0.407	654.6	2764.867	0.000	0.000	12.5	178.521	2111	33.537	OK
FEH: 100 years: +40 %: 240 mins: Summer	9.524	9.524	0.424	0.424	772.4	2888.277	0.000	0.000	12.6	240.735	2187	30.570	OK
FEH: 100 years: +40 %: 240 mins: Winter	9.524	9.524	0.424	0.424	519.4	2884.869	0.000	0.000	12.6	244.086	2093	30.652	OK
FEH: 100 years: +40 %: 360 mins: Summer	9.548	9.548	0.448	0.448	567.1	3058.416	0.000	0.000	12.5	372.703	2157	26.480	OK
FEH: 100 years: +40 %: 360 mins: Winter	9.548	9.548	0.448	0.448	373.5	3055.130	0.000	0.000	12.6	377.488	2098	26.559	OK

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 100 years: +40 %: 480 mins: Summer	9.565	9.565	0.465	0.465	458.1	3180.172	0.000	0.000	12.6	506.660	2162	23.553	OK
FEH: 100 years: +40 %: 480 mins: Winter	9.565	9.565	0.465	0.465	296.4	3176.345	0.000	0.000	12.6	512.729	2259	23.645	OK
FEH: 100 years: +40 %: 600 mins: Summer	9.578	9.578	0.478	0.478	383.7	3273.087	0.000	0.000	12.6	641.880	2342	21.320	OK
FEH: 100 years: +40 %: 600 mins: Winter	9.577	9.578	0.477	0.478	247.6	3269.318	0.000	0.000	12.6	649.089	2248	21.410	OK
FEH: 100 years: +40 %: 720 mins: Summer	9.588	9.588	0.488	0.488	331.4	3346.569	0.000	0.000	12.6	777.778	2320	19.553	OK
FEH: 100 years: +40 %: 720 mins: Winter	9.588	9.588	0.488	0.488	213.8	3342.849	0.000	0.000	12.6	786.021	2245	19.643	OK
FEH: 100 years: +40 %: 960 mins: Summer	9.603	9.603	0.503	0.503	263.5	3454.578	0.000	0.000	12.6	1050.097	2298	16.957	OK
FEH: 100 years: +40 %: 960 mins: Winter	9.603	9.603	0.503	0.503	170.0	3451.606	0.000	0.000	12.6	1060.135	2314	17.028	OK
FEH: 100 years: +40 %: 1440 mins: Summer	9.620	9.620	0.520	0.520	191.5	3575.464	0.000	0.000	12.6	1589.817	2402	14.051	OK
FEH: 100 years: +40 %: 1440 mins: Winter	9.620	9.620	0.520	0.520	123.5	3575.903	0.000	0.000	12.6	1602.706	2379	14.041	OK
FEH: 100 years: +40 %: 2160 mins: Summer	9.626	9.626	0.526	0.526	139.3	3616.311	0.000	0.000	12.6	2368.389	2406	13.069	OK
FEH: 100 years: +40 %: 2160 mins: Winter	9.627	9.627	0.527	0.527	89.9	3627.518	0.000	0.000	12.6	2384.863	2426	12.800	OK
FEH: 100 years: +40 %: 2880 mins: Summer	9.624	9.624	0.524	0.524	111.1	3604.010	0.000	0.000	12.6	3186.633	2396	13.365	OK
FEH: 100 years: +40 %: 2880 mins: Winter	9.623	9.623	0.523	0.523	71.7	3594.465	0.000	0.000	12.6	3213.741	2394	13.594	OK
FEH: 100 years: +40 %: 4320 mins: Summer	9.615	9.615	0.515	0.515	80.5	3537.188	0.000	0.000	12.6	4606.637	2343	14.971	OK
FEH: 100 years: +40 %: 4320 mins: Winter	9.608	9.608	0.508	0.508	51.9	3487.148	0.000	0.000	12.6	4623.470	2316	16.174	OK
FEH: 100 years: +40 %: 5760 mins: Summer	9.602	9.602	0.502	0.502	63.9	3442.655	0.000	0.000	12.6	5275.001	2292	17.244	OK

FEH: 100 years: +40 %: 5760 mins: Winter	9.588	9.588	0.488	0.488	41.3	3345.208	0.000	0.000	12.6	5282.188	2224	19.586	OK
FEH: 100 years: +40 %: 7200 mins: Summer	9.587	9.587	0.487	0.487	53.6	3340.563	0.000	0.000	12.6	5676.468	2222	19.698	OK
FEH: 100 years: +40 %: 7200 mins: Winter	9.566	9.566	0.466	0.466	34.6	3189.938	0.000	0.000	12.6	5680.631	2133	23.319	OK
FEH: 100 years: +40 %: 8640 mins: Summer	9.572	9.572	0.472	0.472	46.4	3226.947	0.000	0.000	12.6	5964.387	2159	22.429	OK
FEH: 100 years: +40 %: 8640 mins: Winter	9.543	9.543	0.443	0.443	29.9	3020.065	0.000	0.000	12.6	5967.120	2041	27.402	OK
FEH: 100 years: +40 %: 10080 mins: Summer	9.555	9.555	0.455	0.455	41.0	3106.295	0.000	0.000	12.6	6190.331	2088	25.329	OK
FEH: 100 years: +40 %: 10080 mins: Winter	9.517	9.517	0.417	0.417	26.4	2840.798	0.000	0.000	12.6	6193.178	1961	31.711	OK

FEH: 100 years: Increase Rainfall (%): +40: Summary Results for Pond 3: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +40 %: 15 mins: Summer	9.399	9.352	0.199	0.152	1961.6	884.552	0.000	0.000	6.2	4.891	2523	70.750	OK
FEH: 100 years: +40 %: 15 mins: Winter	9.408	9.372	0.208	0.172	2067.0	988.360	0.000	0.000	7.0	5.651	2514	67.317	OK
FEH: 100 years: +40 %: 30 mins: Summer	9.412	9.397	0.212	0.197	1330.3	1147.302	0.000	0.000	7.5	16.530	3488	62.062	OK
FEH: 100 years: +40 %: 30 mins: Winter	9.421	9.420	0.221	0.220	1398.3	1284.926	0.000	0.000	7.7	17.297	3772	57.511	OK
FEH: 100 years: +40 %: 60 mins: Summer	9.442	9.442	0.242	0.242	1148.7	1422.555	0.000	0.000	7.7	35.720	3875	52.960	OK
FEH: 100 years: +40 %: 60 mins: Winter	9.470	9.471	0.270	0.271	1034.6	1595.400	0.000	0.000	7.6	31.932	4140	47.244	OK
FEH: 100 years: +40 %: 120 mins: Summer	9.470	9.470	0.270	0.270	768.3	1593.099	0.000	0.000	7.7	67.006	2833	47.320	OK
FEH: 100 years: +40 %: 120 mins: Winter	9.502	9.502	0.302	0.302	619.2	1786.937	0.000	0.000	7.6	67.730	2564	40.910	OK
FEH: 100 years: +40 %: 180 mins: Summer	9.487	9.487	0.287	0.287	581.9	1697.671	0.000	0.000	7.7	101.218	2435	43.862	OK
FEH: 100 years: +40 %: 180 mins: Winter	9.521	9.521	0.321	0.321	449.2	1904.008	0.000	0.000	7.7	105.974	2436	37.039	OK
FEH: 100 years: +40 %: 240 mins: Summer	9.500	9.500	0.300	0.300	473.2	1773.262	0.000	0.000	7.7	137.060	2356	41.363	OK
FEH: 100 years: +40 %: 240 mins: Winter	9.535	9.535	0.335	0.335	356.4	1988.692	0.000	0.000	7.7	145.195	2425	34.239	OK
FEH: 100 years: +40 %: 360 mins: Summer	9.517	9.517	0.317	0.317	347.4	1880.478	0.000	0.000	7.7	210.756	2318	37.817	OK
FEH: 100 years: +40 %: 360 mins: Winter	9.554	9.554	0.354	0.354	256.3	2109.949	0.000	0.000	7.7	225.048	2421	30.229	OK

FEH: 100 years: +40 %: 480 mins: Summer	9.530	9.530	0.330	0.330	280.7	1957.996	0.000	0.000	7.7	286.348	2300	35.254	OK
FEH: 100 years: +40 %: 480 mins: Winter	9.569	9.569	0.369	0.369	203.4	2197.921	0.000	0.000	7.7	306.165	2434	27.320	OK
FEH: 100 years: +40 %: 600 mins: Summer	9.539	9.539	0.339	0.339	235.1	2017.815	0.000	0.000	7.7	362.781	2501	33.276	OK
FEH: 100 years: +40 %: 600 mins: Winter	9.580	9.580	0.380	0.380	169.9	2266.300	0.000	0.000	7.7	388.157	2586	25.059	OK
FEH: 100 years: +40 %: 720 mins: Summer	9.547	9.547	0.347	0.347	203.1	2065.759	0.000	0.000	7.7	439.751	2459	31.691	OK
FEH: 100 years: +40 %: 720 mins: Winter	9.588	9.589	0.388	0.389	146.7	2321.389	0.000	0.000	7.7	470.668	2586	23.237	OK
FEH: 100 years: +40 %: 960 mins: Summer	9.559	9.559	0.359	0.359	161.4	2137.830	0.000	0.000	7.7	594.167	2396	29.307	OK
FEH: 100 years: +40 %: 960 mins: Winter	9.602	9.602	0.402	0.402	116.7	2405.619	0.000	0.000	7.7	636.500	2670	20.452	OK
FEH: 100 years: +40 %: 1440 mins: Summer	9.573	9.573	0.373	0.373	117.3	2223.470	0.000	0.000	7.7	902.175	2494	26.475	OK
FEH: 100 years: +40 %: 1440 mins: Winter	9.619	9.619	0.419	0.419	84.8	2509.375	0.000	0.000	7.7	967.331	2756	17.021	OK
FEH: 100 years: +40 %: 2160 mins: Summer	9.579	9.579	0.379	0.379	85.4	2264.878	0.000	0.000	7.7	1362.418	2492	25.106	OK
FEH: 100 years: +40 %: 2160 mins: Winter	9.628	9.628	0.428	0.428	61.7	2570.797	0.000	0.000	7.7	1449.461	2809	14.990	OK
FEH: 100 years: +40 %: 2880 mins: Summer	9.579	9.579	0.379	0.379	68.1	2260.955	0.000	0.000	7.7	1878.227	2519	25.236	OK
FEH: 100 years: +40 %: 2880 mins: Winter	9.628	9.628	0.428	0.428	49.2	2570.661	0.000	0.000	7.7	1921.697	2796	14.995	OK
FEH: 100 years: +40 %: 4320 mins: Summer	9.574	9.574	0.374	0.374	49.3	2228.804	0.000	0.000	7.7	2719.757	2480	26.299	OK
FEH: 100 years: +40 %: 4320 mins: Winter	9.618	9.618	0.418	0.418	35.6	2506.713	0.000	0.000	7.7	2922.723	2721	17.109	OK
FEH: 100 years: +40 %: 5760 mins: Summer	9.566	9.566	0.366	0.366	39.2	2179.639	0.000	0.000	7.7	3158.582	2427	27.925	OK

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 100 years: +40 %: 5760 mins: Winter	9.606	9.606	0.406	0.406	28.3	2431.700	0.000	0.000	7.7	3507.566	2650	19.590	OK
FEH: 100 years: +40 %: 7200 mins: Summer	9.557	9.557	0.357	0.357	32.8	2124.450	0.000	0.000	7.7	3426.028	2370	29.750	OK
FEH: 100 years: +40 %: 7200 mins: Winter	9.592	9.592	0.392	0.392	23.7	2345.227	0.000	0.000	7.7	3830.969	2567	22.449	OK
FEH: 100 years: +40 %: 8640 mins: Summer	9.546	9.546	0.346	0.346	28.4	2059.754	0.000	0.000	7.7	3615.775	2335	31.889	OK
FEH: 100 years: +40 %: 8640 mins: Winter	9.576	9.576	0.376	0.376	20.5	2246.138	0.000	0.000	7.7	4051.166	2476	25.726	OK
FEH: 100 years: +40 %: 10080 mins: Summer	9.535	9.535	0.335	0.335	25.1	1989.329	0.000	0.000	7.7	3763.215	2282	34.218	OK
FEH: 100 years: +40 %: 10080 mins: Winter	9.559	9.559	0.359	0.359	18.1	2138.974	0.000	0.000	7.7	4218.189	2386	29.269	OK

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 30 years: Increase Rainfall (%): +40: Summary Results for Pond 2: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 30 years: +40 %: 15 mins: Summer	9.311	9.273	0.211	0.173	2489.4	1119.628	0.000	0.000	9.6	7.728	2071	73.086	OK
FEH: 30 years: +40 %: 15 mins: Winter	9.307	9.272	0.207	0.172	2342.0	1119.625	0.000	0.000	9.6	7.680	2070	73.086	OK
FEH: 30 years: +40 %: 30 mins: Summer	9.324	9.317	0.224	0.217	1671.9	1440.083	0.000	0.000	11.7	25.793	2818	65.383	OK
FEH: 30 years: +40 %: 30 mins: Winter	9.318	9.317	0.218	0.217	1569.1	1440.111	0.000	0.000	11.7	25.770	2773	65.382	OK
FEH: 30 years: +40 %: 60 mins: Summer	9.364	9.364	0.264	0.264	1432.5	1768.498	0.000	0.000	12.6	63.286	2931	57.488	OK
FEH: 30 years: +40 %: 60 mins: Winter	9.364	9.364	0.264	0.264	1151.9	1768.306	0.000	0.000	12.6	63.471	2789	57.493	OK
FEH: 30 years: +40 %: 120 mins: Summer	9.398	9.398	0.298	0.298	973.0	2004.606	0.000	0.000	12.6	123.523	2156	51.812	OK
FEH: 30 years: +40 %: 120 mins: Winter	9.398	9.398	0.298	0.298	700.2	2004.056	0.000	0.000	12.6	124.148	1901	51.825	OK
FEH: 30 years: +40 %: 180 mins: Summer	9.418	9.418	0.318	0.318	740.7	2143.041	0.000	0.000	12.6	174.159	1917	48.484	OK
FEH: 30 years: +40 %: 180 mins: Winter	9.418	9.418	0.318	0.318	510.4	2141.784	0.000	0.000	12.6	175.538	1800	48.515	OK
FEH: 30 years: +40 %: 240 mins: Summer	9.432	9.432	0.332	0.332	603.6	2240.431	0.000	0.000	12.6	227.226	1862	46.143	OK
FEH: 30 years: +40 %: 240 mins: Winter	9.432	9.432	0.332	0.332	405.9	2238.509	0.000	0.000	12.6	229.648	1785	46.190	OK
FEH: 30 years: +40 %: 360 mins: Summer	9.451	9.451	0.351	0.351	444.0	2374.236	0.000	0.000	12.6	339.816	1828	42.927	OK
FEH: 30 years: +40 %: 360 mins: Winter	9.451	9.451	0.351	0.351	292.5	2371.277	0.000	0.000	12.6	344.472	1769	42.998	OK

FEH: 30 years: +40 %: 480 mins: Summer	9.464	9.464	0.364	0.364	358.0	2460.931	0.000	0.000	12.6	455.925	1802	40.843	OK
FEH: 30 years: +40 %: 480 mins: Winter	9.463	9.463	0.363	0.363	231.7	2456.778	0.000	0.000	12.6	462.678	1895	40.943	OK
FEH: 30 years: +40 %: 600 mins: Summer	9.472	9.472	0.372	0.372	299.2	2522.975	0.000	0.000	12.6	573.566	1951	39.351	OK
FEH: 30 years: +40 %: 600 mins: Winter	9.472	9.472	0.372	0.372	193.1	2517.816	0.000	0.000	12.6	582.281	1857	39.475	OK
FEH: 30 years: +40 %: 720 mins: Summer	9.479	9.479	0.379	0.379	257.9	2569.369	0.000	0.000	12.6	692.231	1904	38.236	OK
FEH: 30 years: +40 %: 720 mins: Winter	9.478	9.478	0.378	0.378	166.4	2563.571	0.000	0.000	12.6	702.848	1919	38.376	OK
FEH: 30 years: +40 %: 960 mins: Summer	9.488	9.488	0.388	0.388	204.4	2634.727	0.000	0.000	12.6	932.893	1941	36.665	OK
FEH: 30 years: +40 %: 960 mins: Winter	9.487	9.487	0.387	0.387	131.9	2628.073	0.000	0.000	12.6	947.607	1916	36.825	OK
FEH: 30 years: +40 %: 1440 mins: Summer	9.497	9.497	0.397	0.397	147.8	2695.458	0.000	0.000	12.6	1450.653	1933	35.205	OK
FEH: 30 years: +40 %: 1440 mins: Winter	9.496	9.496	0.396	0.396	95.4	2689.122	0.000	0.000	12.6	1476.543	1922	35.357	OK
FEH: 30 years: +40 %: 2160 mins: Summer	9.498	9.498	0.398	0.398	107.3	2699.719	0.000	0.000	12.6	2265.055	1900	35.103	OK
FEH: 30 years: +40 %: 2160 mins: Winter	9.496	9.496	0.396	0.396	69.2	2690.769	0.000	0.000	12.6	2296.471	1899	35.318	OK
FEH: 30 years: +40 %: 2880 mins: Summer	9.496	9.496	0.396	0.396	85.7	2690.905	0.000	0.000	12.6	2929.510	1901	35.315	OK
FEH: 30 years: +40 %: 2880 mins: Winter	9.491	9.491	0.391	0.391	55.3	2650.043	0.000	0.000	12.6	2956.077	1877	36.297	OK
FEH: 30 years: +40 %: 4320 mins: Summer	9.490	9.490	0.390	0.390	62.4	2645.899	0.000	0.000	12.6	3714.073	1896	36.396	OK
FEH: 30 years: +40 %: 4320 mins: Winter	9.478	9.478	0.378	0.378	40.3	2560.828	0.000	0.000	12.6	3726.644	1843	38.441	OK
FEH: 30 years: +40 %: 5760 mins: Summer	9.480	9.480	0.380	0.380	50.0	2577.321	0.000	0.000	12.6	4153.696	1858	38.045	OK

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 30 years: +40 %: 5760 mins: Winter	9.459	9.459	0.359	0.359	32.3	2431.448	0.000	0.000	12.6	4161.662	1782	41.552	OK
FEH: 30 years: +40 %: 7200 mins: Summer	9.469	9.469	0.369	0.369	42.3	2500.245	0.000	0.000	12.6	4477.452	1816	39.898	OK
FEH: 30 years: +40 %: 7200 mins: Winter	9.438	9.438	0.338	0.338	27.3	2279.709	0.000	0.000	12.6	4484.516	1717	45.199	OK
FEH: 30 years: +40 %: 8640 mins: Summer	9.456	9.456	0.356	0.356	36.8	2409.931	0.000	0.000	12.6	4734.209	1777	42.069	OK
FEH: 30 years: +40 %: 8640 mins: Winter	9.409	9.409	0.309	0.309	23.8	2079.089	0.000	0.000	12.6	4740.646	1628	50.022	OK
FEH: 30 years: +40 %: 10080 mins: Summer	9.442	9.442	0.342	0.342	32.8	2305.850	0.000	0.000	12.6	4947.358	1728	44.571	OK
FEH: 30 years: +40 %: 10080 mins: Winter	9.379	9.379	0.279	0.279	21.1	1869.972	0.000	0.000	12.6	4951.867	1527	55.049	OK

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 30 years: Increase Rainfall (%): +40: Summary Results for Pond 3: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 30 years: +40 %: 15 mins: Summer	9.372	9.320	0.172	0.120	1525.2	687.531	0.000	0.000	5.0	3.251	2468	77.265	OK
FEH: 30 years: +40 %: 15 mins: Winter	9.380	9.333	0.180	0.133	1607.1	768.595	0.000	0.000	5.5	3.948	2448	74.584	OK
FEH: 30 years: +40 %: 30 mins: Summer	9.382	9.353	0.182	0.153	1024.4	883.793	0.000	0.000	6.3	12.942	3234	70.775	OK
FEH: 30 years: +40 %: 30 mins: Winter	9.389	9.371	0.189	0.171	1076.7	989.611	0.000	0.000	6.9	14.545	3234	67.276	OK
FEH: 30 years: +40 %: 60 mins: Summer	9.385	9.386	0.185	0.186	877.6	1085.668	0.000	0.000	7.4	35.285	3084	64.100	OK
FEH: 30 years: +40 %: 60 mins: Winter	9.407	9.408	0.207	0.208	790.5	1216.044	0.000	0.000	7.7	37.676	3180	59.788	OK
FEH: 30 years: +40 %: 120 mins: Summer	9.410	9.410	0.210	0.210	596.2	1229.795	0.000	0.000	7.7	79.379	2717	59.334	OK
FEH: 30 years: +40 %: 120 mins: Winter	9.435	9.435	0.235	0.235	480.5	1379.120	0.000	0.000	7.7	78.855	2376	54.396	OK
FEH: 30 years: +40 %: 180 mins: Summer	9.423	9.424	0.223	0.224	453.8	1312.193	0.000	0.000	7.7	122.850	2178	56.609	OK
FEH: 30 years: +40 %: 180 mins: Winter	9.450	9.451	0.250	0.251	350.3	1474.687	0.000	0.000	7.7	112.427	2101	51.236	OK
FEH: 30 years: +40 %: 240 mins: Summer	9.433	9.433	0.233	0.233	369.8	1369.590	0.000	0.000	7.7	164.100	2037	54.711	OK
FEH: 30 years: +40 %: 240 mins: Winter	9.462	9.462	0.262	0.262	278.6	1542.553	0.000	0.000	7.7	144.545	2062	48.992	OK
FEH: 30 years: +40 %: 360 mins: Summer	9.446	9.446	0.246	0.246	272.0	1449.525	0.000	0.000	7.7	239.739	1942	52.068	OK
FEH: 30 years: +40 %: 360 mins: Winter	9.477	9.477	0.277	0.277	200.7	1637.755	0.000	0.000	7.7	211.163	2042	45.844	OK

FEH: 30 years: +40 %: 480 mins: Summer	9.455	9.455	0.255	0.255	219.4	1503.102	0.000	0.000	7.7	311.721	2137	50.296	OK
FEH: 30 years: +40 %: 480 mins: Winter	9.488	9.488	0.288	0.288	159.0	1700.492	0.000	0.000	7.7	281.203	2192	43.769	OK
FEH: 30 years: +40 %: 600 mins: Summer	9.462	9.462	0.262	0.262	183.3	1542.829	0.000	0.000	7.7	383.578	2065	48.983	OK
FEH: 30 years: +40 %: 600 mins: Winter	9.495	9.495	0.295	0.295	132.5	1746.699	0.000	0.000	7.7	352.875	2154	42.241	OK
FEH: 30 years: +40 %: 720 mins: Summer	9.467	9.467	0.267	0.267	158.0	1573.627	0.000	0.000	7.7	456.587	2013	47.964	OK
FEH: 30 years: +40 %: 720 mins: Winter	9.501	9.501	0.301	0.301	114.2	1782.235	0.000	0.000	7.7	425.391	2129	41.066	OK
FEH: 30 years: +40 %: 960 mins: Summer	9.474	9.474	0.274	0.274	125.2	1619.082	0.000	0.000	7.7	606.884	2056	46.461	OK
FEH: 30 years: +40 %: 960 mins: Winter	9.510	9.510	0.310	0.310	90.5	1834.803	0.000	0.000	7.7	572.969	2246	39.328	OK
FEH: 30 years: +40 %: 1440 mins: Summer	9.482	9.482	0.282	0.282	90.6	1667.099	0.000	0.000	7.7	919.709	2058	44.873	OK
FEH: 30 years: +40 %: 1440 mins: Winter	9.519	9.519	0.319	0.319	65.5	1892.691	0.000	0.000	7.7	885.239	2219	37.413	OK
FEH: 30 years: +40 %: 2160 mins: Summer	9.484	9.484	0.284	0.284	65.8	1679.234	0.000	0.000	7.7	1368.879	2078	44.472	OK
FEH: 30 years: +40 %: 2160 mins: Winter	9.523	9.523	0.323	0.323	47.5	1915.392	0.000	0.000	7.7	1392.682	2241	36.663	OK
FEH: 30 years: +40 %: 2880 mins: Summer	9.484	9.484	0.284	0.284	52.5	1676.771	0.000	0.000	7.7	1740.528	2054	44.553	OK
FEH: 30 years: +40 %: 2880 mins: Winter	9.520	9.520	0.320	0.320	37.9	1899.512	0.000	0.000	7.7	1847.560	2238	37.188	OK
FEH: 30 years: +40 %: 4320 mins: Summer	9.480	9.480	0.280	0.280	38.3	1654.252	0.000	0.000	7.7	2214.768	2042	45.298	OK
FEH: 30 years: +40 %: 4320 mins: Winter	9.513	9.513	0.313	0.313	27.6	1852.541	0.000	0.000	7.7	2454.464	2179	38.741	OK
FEH: 30 years: +40 %: 5760 mins: Summer	9.474	9.474	0.274	0.274	30.6	1614.289	0.000	0.000	7.7	2500.923	1999	46.620	OK

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 30 years: +40 %: 5760 mins: Winter	9.502	9.502	0.302	0.302	22.1	1786.393	0.000	0.000	7.7	2793.556	2131	40.928	OK
FEH: 30 years: +40 %: 7200 mins: Summer	9.465	9.465	0.265	0.265	25.9	1564.558	0.000	0.000	7.7	2710.464	1971	48.264	OK
FEH: 30 years: +40 %: 7200 mins: Winter	9.489	9.489	0.289	0.289	18.7	1707.117	0.000	0.000	7.7	3034.346	2074	43.550	OK
FEH: 30 years: +40 %: 8640 mins: Summer	9.455	9.455	0.255	0.255	22.6	1500.615	0.000	0.000	7.7	2873.679	1915	50.378	OK
FEH: 30 years: +40 %: 8640 mins: Winter	9.473	9.473	0.273	0.273	16.3	1607.976	0.000	0.000	7.7	3222.533	1996	46.828	OK
FEH: 30 years: +40 %: 10080 mins: Summer	9.443	9.443	0.243	0.243	20.1	1427.302	0.000	0.000	7.7	3008.254	1865	52.803	OK
FEH: 30 years: +40 %: 10080 mins: Winter	9.451	9.451	0.251	0.251	14.5	1479.964	0.000	0.000	7.7	3375.853	1901	51.061	OK

FEH: 10 years: Increase Rainfall (%): +0: Summary Results for Pond 2: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 10 years: +0 %: 15 mins: Summer	9.246	9.190	0.146	0.090	1322.7	596.550	0.000	0.000	4.0	2.037	2659	85.660	OK
FEH: 10 years: +0 %: 15 mins: Winter	9.245	9.190	0.145	0.090	1244.4	596.334	0.000	0.000	4.0	2.011	2643	85.665	OK
FEH: 10 years: +0 %: 30 mins: Summer	9.255	9.216	0.155	0.116	882.6	761.955	0.000	0.000	6.0	11.379	2917	81.684	OK
FEH: 10 years: +0 %: 30 mins: Winter	9.251	9.216	0.151	0.116	828.3	762.117	0.000	0.000	6.0	11.336	2865	81.680	OK
FEH: 10 years: +0 %: 60 mins: Summer	9.248	9.241	0.148	0.141	753.5	931.301	0.000	0.000	7.8	35.739	2491	77.613	OK
FEH: 10 years: +0 %: 60 mins: Winter	9.241	9.241	0.141	0.141	605.9	931.393	0.000	0.000	7.8	35.658	2388	77.611	OK
FEH: 10 years: +0 %: 120 mins: Summer	9.263	9.263	0.163	0.163	526.7	1081.703	0.000	0.000	9.1	89.164	2214	73.997	OK
FEH: 10 years: +0 %: 120 mins: Winter	9.263	9.263	0.163	0.163	379.0	1081.741	0.000	0.000	9.1	89.146	2073	73.997	OK
FEH: 10 years: +0 %: 180 mins: Summer	9.275	9.276	0.175	0.176	406.1	1164.484	0.000	0.000	9.8	146.005	1811	72.008	OK
FEH: 10 years: +0 %: 180 mins: Winter	9.275	9.276	0.175	0.176	279.9	1165.063	0.000	0.000	9.8	146.002	1623	71.994	OK
FEH: 10 years: +0 %: 240 mins: Summer	9.283	9.284	0.183	0.184	333.4	1218.443	0.000	0.000	10.2	204.047	1594	70.710	OK
FEH: 10 years: +0 %: 240 mins: Winter	9.284	9.284	0.184	0.184	224.2	1220.151	0.000	0.000	10.2	204.033	1481	70.669	OK
FEH: 10 years: +0 %: 360 mins: Summer	9.293	9.293	0.193	0.193	246.9	1283.661	0.000	0.000	10.6	320.274	1655	69.143	OK
FEH: 10 years: +0 %: 360 mins: Winter	9.294	9.294	0.194	0.194	162.6	1286.880	0.000	0.000	10.7	320.261	1520	69.065	OK

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 10 years: +0 %: 480 mins: Summer	9.298	9.298	0.198	0.198	199.9	1319.853	0.000	0.000	10.9	434.293	1497	68.273	OK
FEH: 10 years: +0 %: 480 mins: Winter	9.299	9.299	0.199	0.199	129.4	1324.660	0.000	0.000	10.9	434.352	1523	68.157	OK
FEH: 10 years: +0 %: 600 mins: Summer	9.301	9.301	0.201	0.201	167.6	1340.670	0.000	0.000	11.0	544.799	1526	67.772	OK
FEH: 10 years: +0 %: 600 mins: Winter	9.302	9.302	0.202	0.202	108.1	1346.974	0.000	0.000	11.1	544.932	1412	67.621	OK
FEH: 10 years: +0 %: 720 mins: Summer	9.303	9.303	0.203	0.203	144.7	1351.378	0.000	0.000	11.1	651.179	1416	67.515	OK
FEH: 10 years: +0 %: 720 mins: Winter	9.304	9.304	0.204	0.204	93.3	1360.065	0.000	0.000	11.2	651.420	1406	67.306	OK
FEH: 10 years: +0 %: 960 mins: Summer	9.304	9.304	0.204	0.204	114.9	1360.651	0.000	0.000	11.2	849.485	1425	67.292	OK
FEH: 10 years: +0 %: 960 mins: Winter	9.306	9.306	0.206	0.206	74.1	1370.078	0.000	0.000	11.2	849.893	1430	67.065	OK
FEH: 10 years: +0 %: 1440 mins: Summer	9.307	9.307	0.207	0.207	83.2	1376.171	0.000	0.000	11.3	1178.578	1412	66.919	OK
FEH: 10 years: +0 %: 1440 mins: Winter	9.306	9.306	0.206	0.206	53.7	1373.578	0.000	0.000	11.3	1179.057	1415	66.981	OK
FEH: 10 years: +0 %: 2160 mins: Summer	9.308	9.308	0.208	0.208	60.5	1386.545	0.000	0.000	11.3	1531.546	1406	66.670	OK
FEH: 10 years: +0 %: 2160 mins: Winter	9.305	9.305	0.205	0.205	39.1	1367.564	0.000	0.000	11.2	1531.982	1417	67.126	OK
FEH: 10 years: +0 %: 2880 mins: Summer	9.308	9.308	0.208	0.208	48.4	1383.053	0.000	0.000	11.3	1777.705	1406	66.753	OK
FEH: 10 years: +0 %: 2880 mins: Winter	9.302	9.302	0.202	0.202	31.2	1345.110	0.000	0.000	11.1	1778.045	1417	67.666	OK
FEH: 10 years: +0 %: 4320 mins: Summer	9.303	9.303	0.203	0.203	35.5	1354.334	0.000	0.000	11.1	2113.370	1415	67.444	OK
FEH: 10 years: +0 %: 4320 mins: Winter	9.293	9.293	0.193	0.193	22.9	1282.245	0.000	0.000	10.6	2113.457	1418	69.177	OK
FEH: 10 years: +0 %: 5760 mins: Summer	9.298	9.298	0.198	0.198	28.6	1314.919	0.000	0.000	10.9	2347.499	1410	68.391	OK

FEH: 10 years: +0 %: 5760 mins: Winter	9.283	9.283	0.183	0.183	18.4	1216.116	0.000	0.000	10.1	2347.915	1425	70.766	OK
FEH: 10 years: +0 %: 7200 mins: Summer	9.292	9.292	0.192	0.192	24.3	1275.765	0.000	0.000	10.6	2540.523	1418	69.333	OK
FEH: 10 years: +0 %: 7200 mins: Winter	9.274	9.274	0.174	0.174	15.7	1156.930	0.000	0.000	9.7	2540.818	1429	72.189	OK
FEH: 10 years: +0 %: 8640 mins: Summer	9.286	9.286	0.186	0.186	21.3	1236.288	0.000	0.000	10.3	2703.230	1417	70.281	OK
FEH: 10 years: +0 %: 8640 mins: Winter	9.266	9.266	0.166	0.166	13.7	1102.061	0.000	0.000	9.3	2703.271	1443	73.508	OK
FEH: 10 years: +0 %: 10080 mins: Summer	9.280	9.280	0.180	0.180	19.1	1197.593	0.000	0.000	10.0	2845.153	1424	71.212	OK
FEH: 10 years: +0 %: 10080 mins: Winter	9.259	9.259	0.159	0.159	12.3	1052.318	0.000	0.000	8.8	2845.494	1451	74.704	OK

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 10 years: Increase Rainfall (%): +0: Summary Results for Pond 3: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 10 years: +0 %: 15 mins: Summer	9.320	9.258	0.120	0.058	810.4	367.319	0.000	0.000	1.6	0.376	4148	87.854	OK
FEH: 10 years: +0 %: 15 mins: Winter	9.327	9.271	0.127	0.071	853.9	411.546	0.000	0.000	2.2	0.670	3300	86.391	OK
FEH: 10 years: +0 %: 30 mins: Summer	9.325	9.282	0.125	0.082	540.8	469.399	0.000	0.000	2.9	4.708	3761	84.478	OK
FEH: 10 years: +0 %: 30 mins: Winter	9.331	9.291	0.131	0.091	568.4	523.800	0.000	0.000	3.4	5.903	3516	82.679	OK
FEH: 10 years: +0 %: 60 mins: Summer	9.321	9.299	0.121	0.099	461.7	572.649	0.000	0.000	3.9	16.800	3088	81.064	OK
FEH: 10 years: +0 %: 60 mins: Winter	9.320	9.311	0.120	0.111	415.8	640.894	0.000	0.000	4.5	19.931	2856	78.807	OK
FEH: 10 years: +0 %: 120 mins: Summer	9.315	9.315	0.115	0.115	322.7	666.643	0.000	0.000	4.7	44.978	2689	77.956	OK
FEH: 10 years: +0 %: 120 mins: Winter	9.328	9.328	0.128	0.128	260.1	745.937	0.000	0.000	5.3	51.585	2548	75.334	OK
FEH: 10 years: +0 %: 180 mins: Summer	9.324	9.324	0.124	0.124	248.8	719.169	0.000	0.000	5.1	75.317	2454	76.219	OK
FEH: 10 years: +0 %: 180 mins: Winter	9.338	9.339	0.138	0.139	192.0	804.779	0.000	0.000	5.8	85.432	2095	73.388	OK
FEH: 10 years: +0 %: 240 mins: Summer	9.330	9.330	0.130	0.130	204.3	754.030	0.000	0.000	5.4	106.502	2087	75.066	OK
FEH: 10 years: +0 %: 240 mins: Winter	9.345	9.345	0.145	0.145	153.8	844.562	0.000	0.000	6.0	120.152	1818	72.072	OK
FEH: 10 years: +0 %: 360 mins: Summer	9.337	9.337	0.137	0.137	151.3	797.471	0.000	0.000	5.7	169.520	1765	73.630	OK
FEH: 10 years: +0 %: 360 mins: Winter	9.354	9.354	0.154	0.154	111.6	894.194	0.000	0.000	6.3	189.993	1842	70.431	OK

Project: One Earth Solar Farm	Date: 17/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 10 years: +0 %: 480 mins: Summer	9.341	9.342	0.141	0.142	122.5	822.840	0.000	0.000	5.9	231.886	1844	72.791	OK
FEH: 10 years: +0 %: 480 mins: Winter	9.359	9.359	0.159	0.159	88.8	923.993	0.000	0.000	6.5	259.281	1700	69.446	OK
FEH: 10 years: +0 %: 600 mins: Summer	9.344	9.344	0.144	0.144	102.7	838.935	0.000	0.000	6.0	292.792	1706	72.259	OK
FEH: 10 years: +0 %: 600 mins: Winter	9.362	9.362	0.162	0.162	74.2	943.189	0.000	0.000	6.6	327.313	1715	68.811	OK
FEH: 10 years: +0 %: 720 mins: Summer	9.346	9.346	0.146	0.146	88.6	848.821	0.000	0.000	6.0	351.725	1744	71.932	OK
FEH: 10 years: +0 %: 720 mins: Winter	9.364	9.364	0.164	0.164	64.0	955.708	0.000	0.000	6.7	393.507	1712	68.397	OK
FEH: 10 years: +0 %: 960 mins: Summer	9.347	9.347	0.147	0.147	70.4	857.764	0.000	0.000	6.1	462.751	1756	71.636	OK
FEH: 10 years: +0 %: 960 mins: Winter	9.366	9.366	0.166	0.166	50.9	969.127	0.000	0.000	6.7	519.276	1680	67.953	OK
FEH: 10 years: +0 %: 1440 mins: Summer	9.349	9.349	0.149	0.149	51.0	868.998	0.000	0.000	6.2	653.131	1731	71.264	OK
FEH: 10 years: +0 %: 1440 mins: Winter	9.367	9.367	0.167	0.167	36.9	973.120	0.000	0.000	6.8	737.652	1680	67.821	OK
FEH: 10 years: +0 %: 2160 mins: Summer	9.351	9.351	0.151	0.151	37.1	880.208	0.000	0.000	6.2	869.406	1676	70.894	OK
FEH: 10 years: +0 %: 2160 mins: Winter	9.368	9.368	0.168	0.168	26.8	977.051	0.000	0.000	6.8	985.514	1675	67.691	OK
FEH: 10 years: +0 %: 2880 mins: Summer	9.352	9.352	0.152	0.152	29.7	883.641	0.000	0.000	6.2	1027.068	1688	70.780	OK
FEH: 10 years: +0 %: 2880 mins: Winter	9.366	9.366	0.166	0.166	21.4	969.019	0.000	0.000	6.7	1164.220	1676	67.957	OK
FEH: 10 years: +0 %: 4320 mins: Summer	9.350	9.350	0.150	0.150	21.7	875.764	0.000	0.000	6.2	1247.442	1687	71.041	OK
FEH: 10 years: +0 %: 4320 mins: Winter	9.361	9.361	0.161	0.161	15.7	936.704	0.000	0.000	6.6	1410.446	1666	69.026	OK
FEH: 10 years: +0 %: 5760 mins: Summer	9.348	9.348	0.148	0.148	17.5	859.151	0.000	0.000	6.1	1401.862	1691	71.590	OK

FEH: 10 years: +0 %: 5760 mins: Winter	9.354	9.354	0.154	0.154	12.6	898.449	0.000	0.000	6.3	1581.899	1673	70.291	OK
FEH: 10 years: +0 %: 7200 mins: Summer	9.345	9.345	0.145	0.145	14.9	841.568	0.000	0.000	6.0	1526.826	1682	72.171	OK
FEH: 10 years: +0 %: 7200 mins: Winter	9.348	9.348	0.148	0.148	10.8	862.040	0.000	0.000	6.1	1720.232	1681	71.494	OK
FEH: 10 years: +0 %: 8640 mins: Summer	9.341	9.341	0.141	0.141	13.0	822.080	0.000	0.000	5.9	1631.087	1690	72.816	OK
FEH: 10 years: +0 %: 8640 mins: Winter	9.342	9.342	0.142	0.142	9.4	826.985	0.000	0.000	5.9	1836.053	1684	72.654	OK
FEH: 10 years: +0 %: 10080 mins: Summer	9.338	9.338	0.138	0.138	11.7	801.907	0.000	0.000	5.7	1720.833	1693	73.483	OK
FEH: 10 years: +0 %: 10080 mins: Winter	9.337	9.337	0.137	0.137	8.4	794.522	0.000	0.000	5.7	1936.095	1698	73.727	OK

Catchment Area 1B Type : Catchment Area

Area (ha)	5.774

Preliminary Sizing

Volumetric Runoff Coefficient	0.750
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Catchment Area 1A Type : Catchment Area

Area (ha)	2.096

Preliminary Sizing

Volumetric Runoff Coefficient	0.750
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.750
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: One Earth Solar Farm	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

Pond 1B Type : Pond

Dimensions

Exceedance Level (m)	10.000
Depth (m)	0.800
Base Level (m)	9.200
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	6.02
Total Volume (m³)	6296.953

Depth (m)	Area (m²)	Volume (m³)
0.000	12000.00	0.000
0.800	13943.00	10367.485

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 1B
Bypass Destination	(None)
Capacity Type	No Restriction

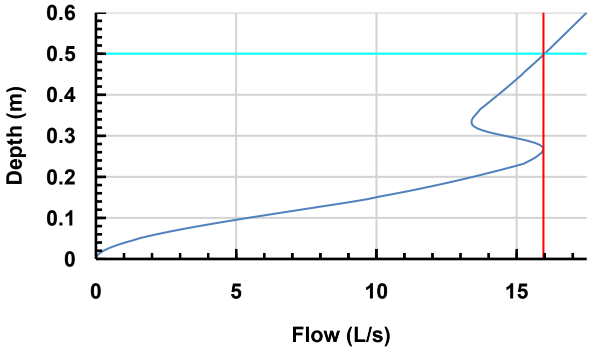
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	9.200
Design Depth (m)	0.500
Design Flow (L/s)	16.0
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0176-1600-0500-1600



Advanced

Perimeter	Circular
Length (m)	270.052
Friction Scheme	Manning's n
n	0.03

Pond 1A

Type : Pond

Dimensions

Exceedance Level (m)	10.000
Depth (m)	1.500
Base Level (m)	8.500
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	6.676
Total Volume (m³)	2151.352

Depth (m)	Area (m²)	Volume (m³)
0.000	1228.00	0.000
1.500	2787.00	2932.491

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 1A
Bypass Destination	(None)
Capacity Type	No Restriction

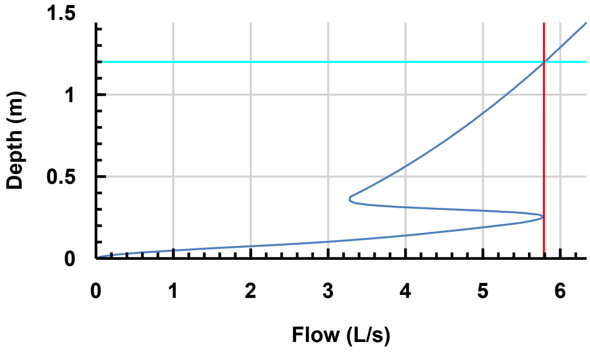
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	8.500
Design Depth (m)	1.200
Design Flow (L/s)	5.8
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0105-5800-1200-5800



Advanced

Perimeter	Circular
Length (m)	130.986
Friction Scheme	Manning's n
n	0.03

Project: One Earth Solar Farm	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 100 years: Increase Rainfall (%): +40: Summary Results for Pond 1B: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +40 %: 15 mins: Summer	9.417	9.349	0.217	0.149	4024.9	1792.885	0.000	0.000	9.9	6.401	3191	71.528	OK
FEH: 100 years: +40 %: 15 mins: Winter	9.427	9.366	0.227	0.166	4235.8	2004.284	0.000	0.000	11.1	7.829	3158	68.171	OK
FEH: 100 years: +40 %: 30 mins: Summer	9.430	9.393	0.230	0.193	2716.8	2338.632	0.000	0.000	13.0	26.686	4132	62.861	OK
FEH: 100 years: +40 %: 30 mins: Winter	9.439	9.415	0.239	0.215	2855.7	2619.094	0.000	0.000	14.3	30.149	4115	58.407	OK
FEH: 100 years: +40 %: 60 mins: Summer	9.436	9.437	0.236	0.237	2348.9	2903.983	0.000	0.000	15.4	73.951	3947	53.883	OK
FEH: 100 years: +40 %: 60 mins: Winter	9.464	9.465	0.264	0.265	2115.6	3255.098	0.000	0.000	15.9	78.418	4098	48.307	OK
FEH: 100 years: +40 %: 120 mins: Summer	9.467	9.468	0.267	0.268	1591.0	3292.082	0.000	0.000	15.9	165.185	3534	47.719	OK
FEH: 100 years: +40 %: 120 mins: Winter	9.499	9.499	0.299	0.299	1282.3	3692.777	0.000	0.000	15.9	160.841	3083	41.356	OK
FEH: 100 years: +40 %: 180 mins: Summer	9.485	9.485	0.285	0.285	1210.1	3520.356	0.000	0.000	15.9	253.368	2838	44.094	OK
FEH: 100 years: +40 %: 180 mins: Winter	9.519	9.520	0.319	0.320	934.0	3954.097	0.000	0.000	15.9	232.456	2729	37.206	OK
FEH: 100 years: +40 %: 240 mins: Summer	9.498	9.498	0.298	0.298	986.1	3683.600	0.000	0.000	15.9	334.150	2661	41.502	OK
FEH: 100 years: +40 %: 240 mins: Winter	9.534	9.534	0.334	0.334	742.7	4142.261	0.000	0.000	15.9	307.416	2687	34.218	OK
FEH: 100 years: +40 %: 360 mins: Summer	9.517	9.517	0.317	0.317	726.0	3919.590	0.000	0.000	15.9	482.401	2563	37.754	OK
FEH: 100 years: +40 %: 360 mins: Winter	9.555	9.555	0.355	0.355	535.6	4412.195	0.000	0.000	15.9	466.465	2665	29.931	OK

FEH: 100 years: +40 %: 480 mins: Summer	9.530	9.530	0.330	0.330	587.6	4094.200	0.000	0.000	15.9	629.337	2530	34.981	OK
FEH: 100 years: +40 %: 480 mins: Winter	9.571	9.571	0.371	0.371	425.8	4609.133	0.000	0.000	15.9	631.083	2876	26.804	OK
FEH: 100 years: +40 %: 600 mins: Summer	9.541	9.541	0.341	0.341	492.9	4231.299	0.000	0.000	15.9	780.828	2759	32.804	OK
FEH: 100 years: +40 %: 600 mins: Winter	9.583	9.583	0.383	0.383	356.2	4763.568	0.000	0.000	15.9	798.803	2838	24.351	OK
FEH: 100 years: +40 %: 720 mins: Summer	9.550	9.550	0.350	0.350	426.3	4342.333	0.000	0.000	15.9	936.420	2704	31.041	OK
FEH: 100 years: +40 %: 720 mins: Winter	9.592	9.592	0.392	0.392	308.0	4888.831	0.000	0.000	15.9	968.426	2812	22.362	OK
FEH: 100 years: +40 %: 960 mins: Summer	9.563	9.563	0.363	0.363	339.6	4511.771	0.000	0.000	15.9	1256.172	2788	28.350	OK
FEH: 100 years: +40 %: 960 mins: Winter	9.607	9.607	0.407	0.407	245.4	5082.923	0.000	0.000	15.9	1310.565	2881	19.280	OK
FEH: 100 years: +40 %: 1440 mins: Summer	9.579	9.579	0.379	0.379	247.3	4720.127	0.000	0.000	15.9	1924.400	2728	25.041	OK
FEH: 100 years: +40 %: 1440 mins: Winter	9.626	9.626	0.426	0.426	178.7	5327.534	0.000	0.000	15.9	1997.268	2925	15.395	OK
FEH: 100 years: +40 %: 2160 mins: Summer	9.588	9.588	0.388	0.388	180.1	4833.032	0.000	0.000	15.9	2984.511	2770	23.248	OK
FEH: 100 years: +40 %: 2160 mins: Winter	9.638	9.638	0.438	0.438	130.1	5480.926	0.000	0.000	15.9	3036.891	2983	12.959	OK
FEH: 100 years: +40 %: 2880 mins: Summer	9.589	9.589	0.389	0.389	143.7	4844.952	0.000	0.000	15.9	3996.699	2774	23.059	OK
FEH: 100 years: +40 %: 2880 mins: Winter	9.639	9.639	0.439	0.439	103.8	5500.584	0.000	0.000	15.9	4146.448	3009	12.647	OK
FEH: 100 years: +40 %: 4320 mins: Summer	9.586	9.586	0.386	0.386	104.1	4811.041	0.000	0.000	15.9	5529.538	2767	23.597	OK
FEH: 100 years: +40 %: 4320 mins: Winter	9.631	9.631	0.431	0.431	75.2	5397.646	0.000	0.000	15.9	6022.396	2947	14.282	OK
FEH: 100 years: +40 %: 5760 mins: Summer	9.581	9.581	0.381	0.381	82.9	4746.923	0.000	0.000	15.9	6448.775	2728	24.616	OK

FEH: 100 years: +40 %: 5760 mins: Winter	9.622	9.622	0.422	0.422	59.9	5281.000	0.000	0.000	15.9	7177.431	2908	16.134	OK
FEH: 100 years: +40 %: 7200 mins: Summer	9.575	9.575	0.375	0.375	69.7	4668.043	0.000	0.000	15.9	7068.520	2710	25.868	OK
FEH: 100 years: +40 %: 7200 mins: Winter	9.612	9.612	0.412	0.412	50.4	5138.945	0.000	0.000	15.9	7913.372	2869	18.390	OK
FEH: 100 years: +40 %: 8640 mins: Summer	9.568	9.568	0.368	0.368	60.6	4577.209	0.000	0.000	15.9	7549.493	2670	27.311	OK
FEH: 100 years: +40 %: 8640 mins: Winter	9.599	9.599	0.399	0.399	43.8	4980.697	0.000	0.000	15.9	8461.441	2804	20.903	OK
FEH: 100 years: +40 %: 10080 mins: Summer	9.560	9.560	0.360	0.360	53.9	4478.337	0.000	0.000	15.9	7948.993	2645	28.881	OK
FEH: 100 years: +40 %: 10080 mins: Winter	9.586	9.586	0.386	0.386	39.0	4814.202	0.000	0.000	15.9	8913.496	2753	23.547	OK

Project: One Earth Solar Farm	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 100 years: Increase Rainfall (%): +40: Summary Results for Pond 1A: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +40 %: 15 mins: Summer	8.954	8.955	0.454	0.455	1461.1	647.899	0.000	0.000	3.8	4.551	1481	69.884	OK
FEH: 100 years: +40 %: 15 mins: Winter	8.954	8.955	0.454	0.455	1372.9	647.691	0.000	0.000	4.3	4.608	1328	69.894	OK
FEH: 100 years: +40 %: 30 mins: Summer	9.071	9.072	0.571	0.572	986.2	846.457	0.000	0.000	4.3	11.223	2237	60.655	OK
FEH: 100 years: +40 %: 30 mins: Winter	9.071	9.072	0.571	0.572	925.6	846.472	0.000	0.000	4.7	11.321	2029	60.654	OK
FEH: 100 years: +40 %: 60 mins: Summer	9.185	9.185	0.685	0.685	852.7	1051.073	0.000	0.000	5.4	26.096	2023	51.144	OK
FEH: 100 years: +40 %: 60 mins: Winter	9.185	9.186	0.685	0.686	685.7	1051.777	0.000	0.000	4.8	26.153	2271	51.111	OK
FEH: 100 years: +40 %: 120 mins: Summer	9.258	9.259	0.758	0.759	577.5	1190.244	0.000	0.000	5.7	56.691	2538	44.675	OK
FEH: 100 years: +40 %: 120 mins: Winter	9.259	9.259	0.759	0.759	415.6	1190.825	0.000	0.000	5.7	56.587	2440	44.648	OK
FEH: 100 years: +40 %: 180 mins: Summer	9.300	9.300	0.800	0.800	439.3	1271.189	0.000	0.000	5.7	88.142	2577	40.912	OK
FEH: 100 years: +40 %: 180 mins: Winter	9.300	9.300	0.800	0.800	302.7	1271.736	0.000	0.000	5.7	87.870	2456	40.887	OK
FEH: 100 years: +40 %: 240 mins: Summer	9.328	9.328	0.828	0.828	358.0	1327.867	0.000	0.000	5.7	120.124	2580	38.278	OK
FEH: 100 years: +40 %: 240 mins: Winter	9.329	9.329	0.829	0.829	240.7	1328.750	0.000	0.000	5.8	119.666	2486	38.237	OK
FEH: 100 years: +40 %: 360 mins: Summer	9.367	9.367	0.867	0.867	263.5	1406.583	0.000	0.000	5.8	184.818	2594	34.619	OK
FEH: 100 years: +40 %: 360 mins: Winter	9.368	9.368	0.868	0.868	173.6	1408.397	0.000	0.000	5.8	183.973	2536	34.534	OK

FEH: 100 years: +40 %: 480 mins: Summer	9.394	9.394	0.894	0.894	213.3	1461.940	0.000	0.000	5.8	250.279	2627	32.046	OK
FEH: 100 years: +40 %: 480 mins: Winter	9.395	9.395	0.895	0.895	138.0	1464.502	0.000	0.000	5.8	249.039	2587	31.926	OK
FEH: 100 years: +40 %: 600 mins: Summer	9.413	9.414	0.913	0.914	178.9	1503.609	0.000	0.000	5.8	316.116	2653	30.109	OK
FEH: 100 years: +40 %: 600 mins: Winter	9.415	9.415	0.915	0.915	115.4	1507.136	0.000	0.000	5.8	314.492	2618	29.945	OK
FEH: 100 years: +40 %: 720 mins: Summer	9.429	9.429	0.929	0.929	154.7	1536.033	0.000	0.000	5.8	382.160	2664	28.602	OK
FEH: 100 years: +40 %: 720 mins: Winter	9.431	9.431	0.931	0.931	99.8	1540.464	0.000	0.000	5.8	380.150	2761	28.396	OK
FEH: 100 years: +40 %: 960 mins: Summer	9.451	9.451	0.951	0.951	123.3	1582.406	0.000	0.000	5.8	514.045	2824	26.446	OK
FEH: 100 years: +40 %: 960 mins: Winter	9.454	9.454	0.954	0.954	79.5	1589.051	0.000	0.000	5.8	511.330	2762	26.137	OK
FEH: 100 years: +40 %: 1440 mins: Summer	9.473	9.473	0.973	0.973	89.8	1630.445	0.000	0.000	5.8	774.354	2879	24.213	OK
FEH: 100 years: +40 %: 1440 mins: Winter	9.478	9.478	0.978	0.978	57.9	1641.448	0.000	0.000	5.8	770.478	2806	23.702	OK
FEH: 100 years: +40 %: 2160 mins: Summer	9.475	9.475	0.975	0.975	65.4	1635.122	0.000	0.000	5.8	1147.792	2797	23.996	OK
FEH: 100 years: +40 %: 2160 mins: Winter	9.484	9.484	0.984	0.984	42.2	1654.385	0.000	0.000	5.8	1143.048	2838	23.100	OK
FEH: 100 years: +40 %: 2880 mins: Summer	9.464	9.464	0.964	0.964	52.2	1609.989	0.000	0.000	5.8	1493.638	2803	25.164	OK
FEH: 100 years: +40 %: 2880 mins: Winter	9.472	9.472	0.972	0.972	33.6	1628.426	0.000	0.000	5.8	1488.844	2817	24.307	OK
FEH: 100 years: +40 %: 4320 mins: Summer	9.435	9.435	0.935	0.935	37.8	1548.721	0.000	0.000	5.8	2097.177	2682	28.012	OK
FEH: 100 years: +40 %: 4320 mins: Winter	9.436	9.436	0.936	0.936	24.4	1550.718	0.000	0.000	5.8	2093.529	2686	27.919	OK
FEH: 100 years: +40 %: 5760 mins: Summer	9.407	9.407	0.907	0.907	30.1	1489.495	0.000	0.000	5.8	2609.629	2604	30.765	OK

FEH: 100 years: +40 %: 5760 mins: Winter	9.399	9.399	0.899	0.899	19.4	1473.624	0.000	0.000	5.8	2609.935	2559	31.502	OK
FEH: 100 years: +40 %: 7200 mins: Summer	9.381	9.381	0.881	0.881	25.3	1435.538	0.000	0.000	5.8	2772.172	2516	33.273	OK
FEH: 100 years: +40 %: 7200 mins: Winter	9.362	9.362	0.862	0.862	16.3	1397.078	0.000	0.000	5.8	2772.371	2451	35.060	OK
FEH: 100 years: +40 %: 8640 mins: Summer	9.357	9.357	0.857	0.857	22.0	1385.427	0.000	0.000	5.8	2899.745	2444	35.602	OK
FEH: 100 years: +40 %: 8640 mins: Winter	9.326	9.326	0.826	0.826	14.2	1322.789	0.000	0.000	5.8	2899.953	2343	38.514	OK
FEH: 100 years: +40 %: 10080 mins: Summer	9.334	9.333	0.834	0.833	19.6	1338.501	0.000	0.000	5.8	3015.224	2379	37.783	OK
FEH: 100 years: +40 %: 10080 mins: Winter	9.290	9.290	0.790	0.790	12.6	1251.775	0.000	0.000	5.8	3014.771	2242	41.815	OK

Project: One Earth Solar Farm	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 30 years: Increase Rainfall (%): +40: Summary Results for Pond 1B: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 30 years: +40 %: 15 mins: Summer	9.386	9.314	0.186	0.114	3102.3	1387.990	0.000	0.000	6.8	3.401	3625	77.958	OK
FEH: 30 years: +40 %: 15 mins: Winter	9.395	9.330	0.195	0.130	3267.0	1556.992	0.000	0.000	8.2	4.586	3345	75.274	OK
FEH: 30 years: +40 %: 30 mins: Summer	9.398	9.348	0.198	0.148	2084.2	1796.705	0.000	0.000	9.9	18.921	4179	71.467	OK
FEH: 30 years: +40 %: 30 mins: Winter	9.406	9.366	0.206	0.166	2190.8	2011.939	0.000	0.000	11.2	22.072	4068	68.049	OK
FEH: 30 years: +40 %: 60 mins: Summer	9.390	9.382	0.190	0.182	1791.2	2217.022	0.000	0.000	12.3	56.854	3772	64.792	OK
FEH: 30 years: +40 %: 60 mins: Winter	9.403	9.404	0.203	0.204	1613.2	2483.813	0.000	0.000	13.7	63.990	3653	60.555	OK
FEH: 30 years: +40 %: 120 mins: Summer	9.408	9.409	0.208	0.209	1235.1	2555.657	0.000	0.000	14.0	138.633	3420	59.414	OK
FEH: 30 years: +40 %: 120 mins: Winter	9.433	9.433	0.233	0.233	995.4	2862.852	0.000	0.000	15.3	153.970	3101	54.536	OK
FEH: 30 years: +40 %: 180 mins: Summer	9.423	9.424	0.223	0.224	943.8	2741.595	0.000	0.000	14.8	225.092	2787	56.462	OK
FEH: 30 years: +40 %: 180 mins: Winter	9.450	9.450	0.250	0.250	728.5	3071.515	0.000	0.000	15.7	245.235	2466	51.222	OK
FEH: 30 years: +40 %: 240 mins: Summer	9.433	9.434	0.233	0.234	770.6	2867.914	0.000	0.000	15.3	313.988	2463	54.456	OK
FEH: 30 years: +40 %: 240 mins: Winter	9.461	9.461	0.261	0.261	580.4	3216.377	0.000	0.000	15.9	336.705	2347	48.922	OK
FEH: 30 years: +40 %: 360 mins: Summer	9.447	9.447	0.247	0.247	568.3	3040.542	0.000	0.000	15.7	492.526	2254	51.714	OK
FEH: 30 years: +40 %: 360 mins: Winter	9.477	9.477	0.277	0.277	419.3	3416.307	0.000	0.000	15.9	518.665	2274	45.747	OK

FEH: 30 years: +40 %: 480 mins: Summer	9.456	9.456	0.256	0.256	459.3	3153.087	0.000	0.000	15.8	670.238	2444	49.927	OK
FEH: 30 years: +40 %: 480 mins: Winter	9.488	9.488	0.288	0.288	332.9	3550.624	0.000	0.000	15.9	696.402	2430	43.614	OK
FEH: 30 years: +40 %: 600 mins: Summer	9.463	9.463	0.263	0.263	384.5	3233.291	0.000	0.000	15.9	846.816	2322	48.653	OK
FEH: 30 years: +40 %: 600 mins: Winter	9.496	9.496	0.296	0.296	277.8	3650.403	0.000	0.000	15.9	869.717	2371	42.029	OK
FEH: 30 years: +40 %: 720 mins: Summer	9.467	9.467	0.267	0.267	331.7	3292.715	0.000	0.000	15.9	1021.636	2233	47.709	OK
FEH: 30 years: +40 %: 720 mins: Winter	9.502	9.502	0.302	0.302	239.7	3729.096	0.000	0.000	15.9	1039.947	2455	40.779	OK
FEH: 30 years: +40 %: 960 mins: Summer	9.474	9.474	0.274	0.274	263.1	3373.648	0.000	0.000	15.9	1364.305	2384	46.424	OK
FEH: 30 years: +40 %: 960 mins: Winter	9.511	9.511	0.311	0.311	190.1	3846.312	0.000	0.000	15.9	1375.858	2453	38.918	OK
FEH: 30 years: +40 %: 1440 mins: Summer	9.480	9.480	0.280	0.280	190.9	3452.798	0.000	0.000	15.9	2013.521	2362	45.167	OK
FEH: 30 years: +40 %: 1440 mins: Winter	9.522	9.522	0.322	0.322	137.9	3992.510	0.000	0.000	15.9	2040.099	2477	36.596	OK
FEH: 30 years: +40 %: 2160 mins: Summer	9.484	9.484	0.284	0.284	138.9	3504.119	0.000	0.000	15.9	2867.436	2312	44.352	OK
FEH: 30 years: +40 %: 2160 mins: Winter	9.528	9.528	0.328	0.328	100.4	4068.756	0.000	0.000	15.9	2986.605	2516	35.385	OK
FEH: 30 years: +40 %: 2880 mins: Summer	9.487	9.487	0.287	0.287	111.0	3535.152	0.000	0.000	15.9	3554.431	2312	43.859	OK
FEH: 30 years: +40 %: 2880 mins: Winter	9.528	9.528	0.328	0.328	80.2	4056.774	0.000	0.000	15.9	3809.963	2516	35.576	OK
FEH: 30 years: +40 %: 4320 mins: Summer	9.487	9.487	0.287	0.287	81.1	3538.352	0.000	0.000	15.9	4501.038	2310	43.809	OK
FEH: 30 years: +40 %: 4320 mins: Winter	9.523	9.523	0.323	0.323	58.6	3994.016	0.000	0.000	15.9	4985.056	2485	36.572	OK
FEH: 30 years: +40 %: 5760 mins: Summer	9.484	9.484	0.284	0.284	65.3	3509.146	0.000	0.000	15.9	5140.151	2302	44.272	OK

Project: One Earth Solar Farm	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 30 years: +40 %: 5760 mins: Winter	9.515	9.515	0.315	0.315	47.2	3891.822	0.000	0.000	15.9	5754.766	2440	38.195	OK
FEH: 30 years: +40 %: 7200 mins: Summer	9.483	9.483	0.283	0.283	55.7	3488.143	0.000	0.000	15.9	5670.375	2288	44.606	OK
FEH: 30 years: +40 %: 7200 mins: Winter	9.507	9.507	0.307	0.307	40.3	3792.266	0.000	0.000	15.9	6366.191	2399	39.776	OK
FEH: 30 years: +40 %: 8640 mins: Summer	9.480	9.480	0.280	0.280	49.2	3454.739	0.000	0.000	15.9	6120.875	2283	45.136	OK
FEH: 30 years: +40 %: 8640 mins: Winter	9.498	9.498	0.298	0.298	35.5	3674.590	0.000	0.000	15.9	6878.281	2360	41.645	OK
FEH: 30 years: +40 %: 10080 mins: Summer	9.477	9.477	0.277	0.277	44.3	3411.257	0.000	0.000	15.9	6517.289	2270	45.827	OK
FEH: 30 years: +40 %: 10080 mins: Winter	9.488	9.488	0.288	0.288	32.0	3549.623	0.000	0.000	15.9	7323.942	2313	43.630	OK

FEH: 30 years: Increase Rainfall (%): +40: Summary Results for Pond 1A: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 30 years: +40 %: 15 mins: Summer	8.861	8.862	0.361	0.362	1126.1	500.574	0.000	0.000	3.5	4.304	1948	76.732	OK
FEH: 30 years: +40 %: 15 mins: Winter	8.862	8.863	0.362	0.363	1058.9	501.183	0.000	0.000	3.5	4.371	1744	76.704	OK
FEH: 30 years: +40 %: 30 mins: Summer	8.955	8.955	0.455	0.455	756.6	649.049	0.000	0.000	4.2	10.126	2278	69.831	OK
FEH: 30 years: +40 %: 30 mins: Winter	8.955	8.955	0.455	0.455	710.1	649.045	0.000	0.000	4.3	10.237	1982	69.831	OK
FEH: 30 years: +40 %: 60 mins: Summer	9.045	9.046	0.545	0.546	650.2	800.626	0.000	0.000	5.4	23.213	1548	62.785	OK
FEH: 30 years: +40 %: 60 mins: Winter	9.045	9.045	0.545	0.545	522.9	800.872	0.000	0.000	5.7	23.431	1423	62.774	OK
FEH: 30 years: +40 %: 120 mins: Summer	9.114	9.114	0.614	0.614	448.3	921.413	0.000	0.000	5.4	50.863	1671	57.171	OK
FEH: 30 years: +40 %: 120 mins: Winter	9.114	9.114	0.614	0.614	322.6	921.560	0.000	0.000	5.7	51.108	1664	57.164	OK
FEH: 30 years: +40 %: 180 mins: Summer	9.150	9.151	0.650	0.651	342.6	987.230	0.000	0.000	5.8	79.311	1928	54.111	OK
FEH: 30 years: +40 %: 180 mins: Winter	9.151	9.150	0.651	0.650	236.1	987.230	0.000	0.000	5.8	79.515	1915	54.111	OK
FEH: 30 years: +40 %: 240 mins: Summer	9.175	9.175	0.675	0.675	279.7	1031.680	0.000	0.000	5.8	108.146	2031	52.045	OK
FEH: 30 years: +40 %: 240 mins: Winter	9.175	9.175	0.675	0.675	188.1	1031.979	0.000	0.000	5.8	108.290	1985	52.031	OK
FEH: 30 years: +40 %: 360 mins: Summer	9.207	9.207	0.707	0.707	206.3	1091.679	0.000	0.000	5.8	166.528	2097	49.256	OK
FEH: 30 years: +40 %: 360 mins: Winter	9.207	9.207	0.707	0.707	135.9	1092.682	0.000	0.000	5.8	166.528	2055	49.210	OK

FEH: 30 years: +40 %: 480 mins: Summer	9.227	9.227	0.727	0.727	166.7	1129.880	0.000	0.000	5.8	225.223	2113	47.480	OK
FEH: 30 years: +40 %: 480 mins: Winter	9.228	9.228	0.728	0.728	107.9	1131.422	0.000	0.000	5.8	225.065	2079	47.409	OK
FEH: 30 years: +40 %: 600 mins: Summer	9.241	9.241	0.741	0.741	139.6	1156.316	0.000	0.000	5.8	283.979	2121	46.252	OK
FEH: 30 years: +40 %: 600 mins: Winter	9.242	9.242	0.742	0.742	90.1	1158.432	0.000	0.000	5.8	283.668	2098	46.153	OK
FEH: 30 years: +40 %: 720 mins: Summer	9.251	9.251	0.751	0.751	120.4	1175.135	0.000	0.000	5.8	342.531	2125	45.377	OK
FEH: 30 years: +40 %: 720 mins: Winter	9.252	9.252	0.752	0.752	77.7	1177.993	0.000	0.000	5.8	342.067	2195	45.244	OK
FEH: 30 years: +40 %: 960 mins: Summer	9.263	9.263	0.763	0.763	95.5	1198.978	0.000	0.000	5.8	458.710	2228	44.269	OK
FEH: 30 years: +40 %: 960 mins: Winter	9.265	9.265	0.765	0.765	61.6	1203.288	0.000	0.000	5.8	458.027	2176	44.068	OK
FEH: 30 years: +40 %: 1440 mins: Summer	9.272	9.272	0.772	0.772	69.3	1216.746	0.000	0.000	5.8	685.750	2231	43.443	OK
FEH: 30 years: +40 %: 1440 mins: Winter	9.276	9.276	0.776	0.776	44.7	1224.531	0.000	0.000	5.8	684.799	2231	43.081	OK
FEH: 30 years: +40 %: 2160 mins: Summer	9.265	9.265	0.765	0.765	50.4	1202.227	0.000	0.000	5.8	1005.500	2188	44.118	OK
FEH: 30 years: +40 %: 2160 mins: Winter	9.271	9.271	0.771	0.771	32.5	1214.335	0.000	0.000	5.8	1004.860	2209	43.555	OK
FEH: 30 years: +40 %: 2880 mins: Summer	9.254	9.254	0.754	0.754	40.3	1182.068	0.000	0.000	5.8	1294.902	2155	45.055	OK
FEH: 30 years: +40 %: 2880 mins: Winter	9.255	9.255	0.755	0.755	26.0	1182.932	0.000	0.000	5.8	1295.261	2141	45.015	OK
FEH: 30 years: +40 %: 4320 mins: Summer	9.231	9.231	0.731	0.731	29.4	1136.941	0.000	0.000	5.8	1882.192	2081	47.152	OK
FEH: 30 years: +40 %: 4320 mins: Winter	9.224	9.224	0.724	0.724	19.0	1124.205	0.000	0.000	5.8	1883.409	2043	47.744	OK
FEH: 30 years: +40 %: 5760 mins: Summer	9.209	9.209	0.709	0.709	23.7	1096.094	0.000	0.000	5.8	2070.604	2015	49.051	OK

Project:	Date:		
One Earth Solar Farm	19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 30 years: +40 %: 5760 mins: Winter	9.191	9.191	0.691	0.691	15.3	1062.191	0.000	0.000	5.8	2070.620	1954	50.627	OK
FEH: 30 years: +40 %: 7200 mins: Summer	9.194	9.194	0.694	0.694	20.2	1066.767	0.000	0.000	5.8	2219.395	1957	50.414	OK
FEH: 30 years: +40 %: 7200 mins: Winter	9.163	9.163	0.663	0.663	13.1	1009.841	0.000	0.000	5.8	2219.525	1862	53.060	OK
FEH: 30 years: +40 %: 8640 mins: Summer	9.179	9.179	0.679	0.679	17.9	1039.651	0.000	0.000	5.8	2353.889	1912	51.675	OK
FEH: 30 years: +40 %: 8640 mins: Winter	9.135	9.135	0.635	0.635	11.5	958.579	0.000	0.000	5.8	2354.377	1761	55.443	OK
FEH: 30 years: +40 %: 10080 mins: Summer	9.165	9.165	0.665	0.665	16.1	1013.503	0.000	0.000	5.8	2477.927	1868	52.890	OK
FEH: 30 years: +40 %: 10080 mins: Winter	9.106	9.106	0.606	0.606	10.4	907.467	0.000	0.000	5.8	2478.064	1637	57.819	OK

FEH: 10 years: Increase Rainfall (%): +0: Summary Results for Pond 1B: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 10 years: +0 %: 15 mins: Summer	9.329	9.232	0.129	0.032	1647.5	745.020	0.000	0.000	0.7	0.098	20292	88.169	OK
FEH: 10 years: +0 %: 15 mins: Winter	9.337	9.248	0.137	0.048	1736.0	834.693	0.000	0.000	1.4	0.250	10486	86.744	OK
FEH: 10 years: +0 %: 30 mins: Summer	9.335	9.280	0.135	0.080	1102.1	958.917	0.000	0.000	3.7	5.116	6030	84.772	OK
FEH: 10 years: +0 %: 30 mins: Winter	9.341	9.288	0.141	0.088	1158.4	1074.045	0.000	0.000	4.4	6.695	5548	82.943	OK
FEH: 10 years: +0 %: 60 mins: Summer	9.331	9.297	0.131	0.097	940.7	1170.930	0.000	0.000	5.2	21.280	4777	81.405	OK
FEH: 10 years: +0 %: 60 mins: Winter	9.330	9.309	0.130	0.109	847.3	1310.695	0.000	0.000	6.2	26.133	4234	79.185	OK
FEH: 10 years: +0 %: 120 mins: Summer	9.318	9.315	0.118	0.115	668.4	1390.928	0.000	0.000	6.8	63.195	3895	77.911	OK
FEH: 10 years: +0 %: 120 mins: Winter	9.328	9.328	0.128	0.128	538.7	1556.034	0.000	0.000	8.1	75.700	3554	75.289	OK
FEH: 10 years: +0 %: 180 mins: Summer	9.325	9.325	0.125	0.125	517.7	1512.471	0.000	0.000	7.8	110.655	3562	75.981	OK
FEH: 10 years: +0 %: 180 mins: Winter	9.339	9.339	0.139	0.139	399.6	1691.235	0.000	0.000	9.1	131.311	3162	73.142	OK
FEH: 10 years: +0 %: 240 mins: Summer	9.331	9.331	0.131	0.131	426.1	1595.241	0.000	0.000	8.4	161.187	3196	74.666	OK
FEH: 10 years: +0 %: 240 mins: Winter	9.346	9.347	0.146	0.147	321.0	1784.165	0.000	0.000	9.7	189.583	2667	71.666	OK
FEH: 10 years: +0 %: 360 mins: Summer	9.340	9.340	0.140	0.140	317.3	1706.522	0.000	0.000	9.2	266.879	2574	72.899	OK
FEH: 10 years: +0 %: 360 mins: Winter	9.357	9.357	0.157	0.157	234.1	1909.436	0.000	0.000	10.5	309.090	2562	69.677	OK

FEH: 10 years: +0 %: 480 mins: Summer	9.346	9.346	0.146	0.146	257.7	1775.519	0.000	0.000	9.7	373.476	2622	71.804	OK
FEH: 10 years: +0 %: 480 mins: Winter	9.363	9.363	0.163	0.163	186.7	1988.372	0.000	0.000	11.0	429.420	2347	68.423	OK
FEH: 10 years: +0 %: 600 mins: Summer	9.350	9.350	0.150	0.150	216.2	1821.753	0.000	0.000	10.0	478.636	2428	71.069	OK
FEH: 10 years: +0 %: 600 mins: Winter	9.367	9.367	0.167	0.167	156.2	2041.436	0.000	0.000	11.3	548.706	2361	67.581	OK
FEH: 10 years: +0 %: 720 mins: Summer	9.352	9.352	0.152	0.152	186.7	1853.860	0.000	0.000	10.1	581.204	2479	70.559	OK
FEH: 10 years: +0 %: 720 mins: Winter	9.370	9.370	0.170	0.170	134.9	2078.736	0.000	0.000	11.5	665.671	2235	66.988	OK
FEH: 10 years: +0 %: 960 mins: Summer	9.355	9.355	0.155	0.155	148.0	1890.284	0.000	0.000	10.4	776.878	2366	69.981	OK
FEH: 10 years: +0 %: 960 mins: Winter	9.374	9.374	0.174	0.174	107.0	2123.032	0.000	0.000	11.8	889.505	2232	66.285	OK
FEH: 10 years: +0 %: 1440 mins: Summer	9.358	9.358	0.158	0.158	107.2	1919.766	0.000	0.000	10.6	1131.968	2266	69.513	OK
FEH: 10 years: +0 %: 1440 mins: Winter	9.377	9.377	0.177	0.177	77.5	2158.513	0.000	0.000	11.9	1295.775	2212	65.721	OK
FEH: 10 years: +0 %: 2160 mins: Summer	9.360	9.360	0.160	0.160	78.1	1955.561	0.000	0.000	10.8	1570.050	2294	68.944	OK
FEH: 10 years: +0 %: 2160 mins: Winter	9.379	9.379	0.179	0.179	56.4	2180.192	0.000	0.000	12.1	1795.692	2231	65.377	OK
FEH: 10 years: +0 %: 2880 mins: Summer	9.363	9.363	0.163	0.163	62.5	1981.608	0.000	0.000	10.9	1915.919	2269	68.531	OK
FEH: 10 years: +0 %: 2880 mins: Winter	9.379	9.379	0.179	0.179	45.2	2191.613	0.000	0.000	12.1	2187.465	2200	65.196	OK
FEH: 10 years: +0 %: 4320 mins: Summer	9.364	9.364	0.164	0.164	46.0	2003.938	0.000	0.000	11.1	2426.376	2244	68.176	OK
FEH: 10 years: +0 %: 4320 mins: Winter	9.378	9.378	0.178	0.178	33.2	2173.460	0.000	0.000	12.0	2759.283	2209	65.484	OK
FEH: 10 years: +0 %: 5760 mins: Summer	9.365	9.365	0.165	0.165	37.3	2009.206	0.000	0.000	11.1	2810.262	2243	68.092	OK

FEH: 10 years: +0 %: 5760 mins: Winter	9.375	9.375	0.175	0.175	26.9	2137.685	0.000	0.000	11.8	3184.921	2205	66.052	OK
FEH: 10 years: +0 %: 7200 mins: Summer	9.365	9.365	0.165	0.165	32.0	2015.017	0.000	0.000	11.1	3144.332	2237	68.000	OK
FEH: 10 years: +0 %: 7200 mins: Winter	9.373	9.373	0.173	0.173	23.2	2108.099	0.000	0.000	11.7	3555.143	2216	66.522	OK
FEH: 10 years: +0 %: 8640 mins: Summer	9.365	9.365	0.165	0.165	28.4	2014.388	0.000	0.000	11.1	3436.101	2239	68.010	OK
FEH: 10 years: +0 %: 8640 mins: Winter	9.370	9.370	0.170	0.170	20.5	2075.167	0.000	0.000	11.5	3878.761	2213	67.045	OK
FEH: 10 years: +0 %: 10080 mins: Summer	9.365	9.365	0.165	0.165	25.8	2007.588	0.000	0.000	11.1	3697.381	2236	68.118	OK
FEH: 10 years: +0 %: 10080 mins: Winter	9.367	9.367	0.167	0.167	18.6	2039.698	0.000	0.000	11.3	4168.210	2222	67.608	OK

Project: One Earth Solar Farm	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 10 years: Increase Rainfall (%): +0: Summary Results for Pond 1A: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 10 years: +0 %: 15 mins: Summer	8.703	8.704	0.203	0.204	598.1	267.121	0.000	0.000	5.3	5.460	897	87.584	OK
FEH: 10 years: +0 %: 15 mins: Winter	8.702	8.704	0.202	0.204	562.7	267.046	0.000	0.000	5.3	5.456	891	87.587	OK
FEH: 10 years: +0 %: 30 mins: Summer	8.755	8.755	0.255	0.255	400.1	340.934	0.000	0.000	5.8	14.301	1340	84.153	OK
FEH: 10 years: +0 %: 30 mins: Winter	8.755	8.755	0.255	0.255	375.5	340.930	0.000	0.000	5.8	14.332	1313	84.153	OK
FEH: 10 years: +0 %: 60 mins: Summer	8.806	8.806	0.306	0.306	341.5	415.799	0.000	0.000	5.8	25.912	994	80.673	OK
FEH: 10 years: +0 %: 60 mins: Winter	8.806	8.806	0.306	0.306	274.6	415.643	0.000	0.000	5.7	26.124	903	80.680	OK
FEH: 10 years: +0 %: 120 mins: Summer	8.856	8.856	0.356	0.356	242.6	492.346	0.000	0.000	5.8	41.740	915	77.115	OK
FEH: 10 years: +0 %: 120 mins: Winter	8.856	8.856	0.356	0.356	174.6	491.478	0.000	0.000	5.7	42.615	864	77.155	OK
FEH: 10 years: +0 %: 180 mins: Summer	8.882	8.883	0.382	0.383	187.9	533.008	0.000	0.000	5.8	62.438	905	75.224	OK
FEH: 10 years: +0 %: 180 mins: Winter	8.882	8.882	0.382	0.382	129.5	531.521	0.000	0.000	5.7	63.916	864	75.294	OK
FEH: 10 years: +0 %: 240 mins: Summer	8.899	8.899	0.399	0.399	154.7	559.637	0.000	0.000	5.8	84.286	902	73.987	OK
FEH: 10 years: +0 %: 240 mins: Winter	8.898	8.898	0.398	0.398	104.0	558.014	0.000	0.000	5.8	86.231	868	74.062	OK
FEH: 10 years: +0 %: 360 mins: Summer	8.921	8.921	0.421	0.421	115.2	593.599	0.000	0.000	5.7	128.998	899	72.408	OK
FEH: 10 years: +0 %: 360 mins: Winter	8.919	8.919	0.419	0.419	75.9	591.440	0.000	0.000	5.8	131.720	877	72.508	OK

Project: One Earth Solar Farm	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 10 years: +0 %: 480 mins: Summer	8.933	8.933	0.433	0.433	93.5	612.666	0.000	0.000	5.8	173.761	901	71.522	OK
FEH: 10 years: +0 %: 480 mins: Winter	8.931	8.931	0.431	0.431	60.5	610.250	0.000	0.000	5.8	177.193	938	71.634	OK
FEH: 10 years: +0 %: 600 mins: Summer	8.939	8.939	0.439	0.439	78.5	623.749	0.000	0.000	5.8	218.265	967	71.007	OK
FEH: 10 years: +0 %: 600 mins: Winter	8.938	8.938	0.438	0.438	50.6	620.978	0.000	0.000	5.8	222.386	926	71.135	OK
FEH: 10 years: +0 %: 720 mins: Summer	8.943	8.943	0.443	0.443	67.8	629.805	0.000	0.000	5.8	262.489	947	70.725	OK
FEH: 10 years: +0 %: 720 mins: Winter	8.941	8.941	0.441	0.441	43.7	626.782	0.000	0.000	5.8	267.335	913	70.866	OK
FEH: 10 years: +0 %: 960 mins: Summer	8.945	8.945	0.445	0.445	53.7	632.532	0.000	0.000	5.8	352.082	957	70.598	OK
FEH: 10 years: +0 %: 960 mins: Winter	8.943	8.943	0.443	0.443	34.7	629.011	0.000	0.000	5.8	359.374	914	70.762	OK
FEH: 10 years: +0 %: 1440 mins: Summer	8.939	8.939	0.439	0.439	38.9	622.220	0.000	0.000	5.8	585.981	933	71.078	OK
FEH: 10 years: +0 %: 1440 mins: Winter	8.936	8.936	0.436	0.436	25.1	617.653	0.000	0.000	5.8	601.315	905	71.290	OK
FEH: 10 years: +0 %: 2160 mins: Summer	8.926	8.926	0.426	0.426	28.3	602.783	0.000	0.000	5.8	853.388	902	71.981	OK
FEH: 10 years: +0 %: 2160 mins: Winter	8.915	8.915	0.415	0.415	18.3	585.030	0.000	0.000	5.8	860.875	870	72.806	OK
FEH: 10 years: +0 %: 2880 mins: Summer	8.914	8.914	0.414	0.414	22.7	582.258	0.000	0.000	5.8	965.078	857	72.935	OK
FEH: 10 years: +0 %: 2880 mins: Winter	8.894	8.894	0.394	0.394	14.7	551.423	0.000	0.000	5.8	967.792	828	74.369	OK
FEH: 10 years: +0 %: 4320 mins: Summer	8.885	8.885	0.385	0.385	16.7	536.306	0.000	0.000	5.8	1089.450	810	75.071	OK
FEH: 10 years: +0 %: 4320 mins: Winter	8.827	8.827	0.327	0.327	10.8	447.568	0.000	0.000	5.8	1091.260	717	79.196	OK
FEH: 10 years: +0 %: 5760 mins: Summer	8.849	8.849	0.349	0.349	13.5	481.675	0.000	0.000	5.8	1185.265	753	77.611	OK

FEH: 10 years: +0 %: 5760 mins: Winter	8.758	8.758	0.258	0.258	8.7	345.501	0.000	0.000	5.8	1186.118	599	83.940	OK
FEH: 10 years: +0 %: 7200 mins: Summer	8.801	8.801	0.301	0.301	11.6	408.309	0.000	0.000	5.8	1277.474	670	81.021	OK
FEH: 10 years: +0 %: 7200 mins: Winter	8.730	8.730	0.230	0.230	7.5	304.877	0.000	0.000	5.6	1277.252	557	85.829	OK
FEH: 10 years: +0 %: 8640 mins: Summer	8.771	8.771	0.271	0.271	10.3	363.444	0.000	0.000	5.8	1362.425	619	83.106	OK
FEH: 10 years: +0 %: 8640 mins: Winter	8.710	8.710	0.210	0.210	6.7	276.029	0.000	0.000	5.4	1362.176	540	87.170	OK
FEH: 10 years: +0 %: 10080 mins: Summer	8.753	8.753	0.253	0.253	9.4	338.181	0.000	0.000	5.8	1442.233	589	84.281	OK
FEH: 10 years: +0 %: 10080 mins: Winter	8.693	8.693	0.193	0.193	6.0	253.154	0.000	0.000	5.1	1442.000	528	88.233	OK

A9.3 Firewater Scenario (no discharge)

Catchment Area 2

Type : Catchment Area

Area (ha)	4.539

Preliminary Sizing

Volumetric Runoff Coefficient	0.750
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.750
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Catchment Area 3

Type : Catchment Area

Area (ha)	2.781

Preliminary Sizing

Volumetric Runoff Coefficient	0.750
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Pond 2

Type : Pond

Dimensions

Exceedance Level (m)	10.000
Depth (m)	0.900
Base Level (m)	9.100
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.762
Total Volume (m³)	4159.989

Depth (m)	Area (m²)	Volume (m³)
0.000	6516.00	0.000
0.900	7800.00	6433.545

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 2
Bypass Destination	(None)
Capacity Type	No Restriction

Advanced

Perimeter	Circular
Length (m)	223.506
Friction Scheme	Manning's n
n	0.03

Pond 3 Type : Pond

Dimensions

Exceedance Level (m)	10.000
Depth (m)	0.800
Base Level (m)	9.200
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	4.72
Total Volume (m³)	3024.118

Depth (m)	Area (m²)	Volume (m³)
0.000	5725.90	0.000
0.800	6783.50	4997.788

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 3
Bypass Destination	(None)
Capacity Type	No Restriction

Advanced

Perimeter	Circular
Length (m)	224.803
Friction Scheme	Manning's n
n	0.03

Project: One Earth Solar Farm Fire Water Scenario	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 10 years: Increase Rainfall (%): +0: Summary Results for Pond 2: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 10 years: +0 %: 15 mins: Summer	9.246	9.191	0.146	0.091	1322.7	596.594	0.000	0.000	0.0	0.000		85.659	OK
FEH: 10 years: +0 %: 15 mins: Winter	9.245	9.191	0.145	0.091	1244.4	597.173	0.000	0.000	0.0	0.000		85.645	OK
FEH: 10 years: +0 %: 30 mins: Summer	9.255	9.217	0.155	0.117	882.6	764.610	0.000	0.000	0.0	0.000		81.620	OK
FEH: 10 years: +0 %: 30 mins: Winter	9.251	9.217	0.151	0.117	828.3	764.610	0.000	0.000	0.0	0.000		81.620	OK
FEH: 10 years: +0 %: 60 mins: Summer	9.248	9.243	0.148	0.143	753.5	941.686	0.000	0.000	0.0	0.000		77.363	OK
FEH: 10 years: +0 %: 60 mins: Winter	9.243	9.243	0.143	0.143	605.9	941.613	0.000	0.000	0.0	0.000		77.365	OK
FEH: 10 years: +0 %: 120 mins: Summer	9.268	9.268	0.168	0.168	526.7	1109.804	0.000	0.000	0.0	0.000		73.322	OK
FEH: 10 years: +0 %: 120 mins: Winter	9.267	9.267	0.167	0.167	379.0	1109.781	0.000	0.000	0.0	0.000		73.323	OK
FEH: 10 years: +0 %: 180 mins: Summer	9.283	9.283	0.183	0.183	406.1	1212.062	0.000	0.000	0.0	0.000		70.864	OK
FEH: 10 years: +0 %: 180 mins: Winter	9.283	9.283	0.183	0.183	279.9	1212.061	0.000	0.000	0.0	0.000		70.864	OK
FEH: 10 years: +0 %: 240 mins: Summer	9.294	9.294	0.194	0.194	333.4	1286.550	0.000	0.000	0.0	0.000		69.073	OK
FEH: 10 years: +0 %: 240 mins: Winter	9.294	9.294	0.194	0.194	224.2	1286.545	0.000	0.000	0.0	0.000		69.073	OK
FEH: 10 years: +0 %: 360 mins: Summer	9.309	9.309	0.209	0.209	246.9	1394.343	0.000	0.000	0.0	0.000		66.482	OK
FEH: 10 years: +0 %: 360 mins: Winter	9.309	9.309	0.209	0.209	162.6	1394.299	0.000	0.000	0.0	0.000		66.483	OK

FEH: 10 years: +0 %: 480 mins: Summer	9.321	9.321	0.221	0.221	199.9	1473.985	0.000	0.000	0.0	0.000		64.568	OK
FEH: 10 years: +0 %: 480 mins: Winter	9.321	9.321	0.221	0.221	129.4	1473.982	0.000	0.000	0.0	0.000		64.568	OK
FEH: 10 years: +0 %: 600 mins: Summer	9.331	9.331	0.231	0.231	167.6	1538.835	0.000	0.000	0.0	0.000		63.009	OK
FEH: 10 years: +0 %: 600 mins: Winter	9.331	9.331	0.231	0.231	108.1	1538.796	0.000	0.000	0.0	0.000		63.010	OK
FEH: 10 years: +0 %: 720 mins: Summer	9.339	9.339	0.239	0.239	144.7	1594.243	0.000	0.000	0.0	0.000		61.677	OK
FEH: 10 years: +0 %: 720 mins: Winter	9.339	9.339	0.239	0.239	93.3	1594.243	0.000	0.000	0.0	0.000		61.677	OK
FEH: 10 years: +0 %: 960 mins: Summer	9.352	9.352	0.252	0.252	114.9	1688.241	0.000	0.000	0.0	0.000		59.417	OK
FEH: 10 years: +0 %: 960 mins: Winter	9.352	9.352	0.252	0.252	74.1	1688.265	0.000	0.000	0.0	0.000		59.417	OK
FEH: 10 years: +0 %: 1440 mins: Summer	9.374	9.374	0.274	0.274	83.2	1834.505	0.000	0.000	0.0	0.000		55.901	OK
FEH: 10 years: +0 %: 1440 mins: Winter	9.374	9.374	0.274	0.274	53.7	1834.445	0.000	0.000	0.0	0.000		55.903	OK
FEH: 10 years: +0 %: 2160 mins: Summer	9.398	9.398	0.298	0.298	60.5	2001.131	0.000	0.000	0.0	0.000		51.896	OK
FEH: 10 years: +0 %: 2160 mins: Winter	9.398	9.398	0.298	0.298	39.1	2001.109	0.000	0.000	0.0	0.000		51.896	OK
FEH: 10 years: +0 %: 2880 mins: Summer	9.417	9.417	0.317	0.317	48.4	2134.079	0.000	0.000	0.0	0.000		48.700	OK
FEH: 10 years: +0 %: 2880 mins: Winter	9.417	9.417	0.317	0.317	31.2	2134.096	0.000	0.000	0.0	0.000		48.699	OK
FEH: 10 years: +0 %: 4320 mins: Summer	9.447	9.447	0.347	0.347	35.5	2345.218	0.000	0.000	0.0	0.000		43.624	OK
FEH: 10 years: +0 %: 4320 mins: Winter	9.447	9.447	0.347	0.347	22.9	2345.137	0.000	0.000	0.0	0.000		43.626	OK
FEH: 10 years: +0 %: 5760 mins: Summer	9.472	9.472	0.372	0.372	28.6	2517.585	0.000	0.000	0.0	0.000		39.481	OK

Project: One Earth Solar Farm Fire Water Scenario	Date: 19/02/2025 Designed by: S.Thorpe Checked by: C.Thwaites Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS

FEH: 10 years: +0 %: 5760 mins: Winter	9.472	9.472	0.372	0.372	18.4	2517.855	0.000	0.000	0.0	0.000		39.474	OK
FEH: 10 years: +0 %: 7200 mins: Summer	9.494	9.494	0.394	0.394	24.3	2674.446	0.000	0.000	0.0	0.000		35.710	OK
FEH: 10 years: +0 %: 7200 mins: Winter	9.494	9.494	0.394	0.394	15.7	2674.584	0.000	0.000	0.0	0.000		35.707	OK
FEH: 10 years: +0 %: 8640 mins: Summer	9.514	9.514	0.414	0.414	21.3	2813.806	0.000	0.000	0.0	0.000		32.360	OK
FEH: 10 years: +0 %: 8640 mins: Winter	9.514	9.514	0.414	0.414	13.7	2813.673	0.000	0.000	0.0	0.000		32.363	OK
FEH: 10 years: +0 %: 10080 mins: Summer	9.531	9.531	0.431	0.431	19.1	2939.224	0.000	0.000	0.0	0.000		29.345	OK
FEH: 10 years: +0 %: 10080 mins: Winter	9.531	9.531	0.431	0.431	12.3	2939.375	0.000	0.000	0.0	0.000		29.342	OK

Project: One Earth Solar Farm Fire Water Scenario	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 10 years: Increase Rainfall (%): +0: Summary Results for Pond 3: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 10 years: +0 %: 15 mins: Summer	9.320	9.259	0.120	0.059	810.4	367.368	0.000	0.000	0.0	0.000		87.852	OK
FEH: 10 years: +0 %: 15 mins: Winter	9.327	9.271	0.127	0.071	853.9	411.670	0.000	0.000	0.0	0.000		86.387	OK
FEH: 10 years: +0 %: 30 mins: Summer	9.325	9.282	0.125	0.082	540.8	469.823	0.000	0.000	0.0	0.000		84.464	OK
FEH: 10 years: +0 %: 30 mins: Winter	9.331	9.291	0.131	0.091	568.4	524.685	0.000	0.000	0.0	0.000		82.650	OK
FEH: 10 years: +0 %: 60 mins: Summer	9.321	9.300	0.121	0.100	461.7	576.943	0.000	0.000	0.0	0.000		80.922	OK
FEH: 10 years: +0 %: 60 mins: Winter	9.320	9.312	0.120	0.112	415.8	646.143	0.000	0.000	0.0	0.000		78.634	OK
FEH: 10 years: +0 %: 120 mins: Summer	9.317	9.318	0.117	0.118	322.7	679.957	0.000	0.000	0.0	0.000		77.516	OK
FEH: 10 years: +0 %: 120 mins: Winter	9.331	9.331	0.131	0.131	260.1	761.541	0.000	0.000	0.0	0.000		74.818	OK
FEH: 10 years: +0 %: 180 mins: Summer	9.328	9.328	0.128	0.128	248.8	742.604	0.000	0.000	0.0	0.000		75.444	OK
FEH: 10 years: +0 %: 180 mins: Winter	9.343	9.343	0.143	0.143	192.0	831.723	0.000	0.000	0.0	0.000		72.497	OK
FEH: 10 years: +0 %: 240 mins: Summer	9.336	9.336	0.136	0.136	204.3	788.241	0.000	0.000	0.0	0.000		73.935	OK
FEH: 10 years: +0 %: 240 mins: Winter	9.352	9.352	0.152	0.152	153.8	882.822	0.000	0.000	0.0	0.000		70.807	OK
FEH: 10 years: +0 %: 360 mins: Summer	9.347	9.347	0.147	0.147	151.3	854.274	0.000	0.000	0.0	0.000		71.751	OK
FEH: 10 years: +0 %: 360 mins: Winter	9.364	9.364	0.164	0.164	111.6	956.764	0.000	0.000	0.0	0.000		68.362	OK

FEH: 10 years: +0 %: 480 mins: Summer	9.355	9.355	0.155	0.155	122.5	903.061	0.000	0.000	0.0	0.000		70.138	OK
FEH: 10 years: +0 %: 480 mins: Winter	9.373	9.373	0.173	0.173	88.8	1011.425	0.000	0.000	0.0	0.000		66.555	OK
FEH: 10 years: +0 %: 600 mins: Summer	9.362	9.362	0.162	0.162	102.7	942.793	0.000	0.000	0.0	0.000		68.824	OK
FEH: 10 years: +0 %: 600 mins: Winter	9.381	9.381	0.181	0.181	74.2	1055.944	0.000	0.000	0.0	0.000		65.083	OK
FEH: 10 years: +0 %: 720 mins: Summer	9.367	9.367	0.167	0.167	88.6	976.747	0.000	0.000	0.0	0.000		67.701	OK
FEH: 10 years: +0 %: 720 mins: Winter	9.387	9.387	0.187	0.187	64.0	1093.966	0.000	0.000	0.0	0.000		63.825	OK
FEH: 10 years: +0 %: 960 mins: Summer	9.377	9.377	0.177	0.177	70.4	1034.339	0.000	0.000	0.0	0.000		65.797	OK
FEH: 10 years: +0 %: 960 mins: Winter	9.398	9.398	0.198	0.198	50.9	1158.447	0.000	0.000	0.0	0.000		61.693	OK
FEH: 10 years: +0 %: 1440 mins: Summer	9.392	9.392	0.192	0.192	51.0	1123.821	0.000	0.000	0.0	0.000		62.838	OK
FEH: 10 years: +0 %: 1440 mins: Winter	9.415	9.415	0.215	0.215	36.9	1258.749	0.000	0.000	0.0	0.000		58.376	OK
FEH: 10 years: +0 %: 2160 mins: Summer	9.409	9.409	0.209	0.209	37.1	1226.045	0.000	0.000	0.0	0.000		59.458	OK
FEH: 10 years: +0 %: 2160 mins: Winter	9.434	9.434	0.234	0.234	26.8	1373.127	0.000	0.000	0.0	0.000		54.594	OK
FEH: 10 years: +0 %: 2880 mins: Summer	9.423	9.423	0.223	0.223	29.7	1307.465	0.000	0.000	0.0	0.000		56.765	OK
FEH: 10 years: +0 %: 2880 mins: Winter	9.449	9.449	0.249	0.249	21.4	1464.419	0.000	0.000	0.0	0.000		51.575	OK
FEH: 10 years: +0 %: 4320 mins: Summer	9.444	9.444	0.244	0.244	21.7	1436.606	0.000	0.000	0.0	0.000		52.495	OK
FEH: 10 years: +0 %: 4320 mins: Winter	9.473	9.473	0.273	0.273	15.7	1609.084	0.000	0.000	0.0	0.000		46.792	OK
FEH: 10 years: +0 %: 5760 mins: Summer	9.462	9.462	0.262	0.262	17.5	1542.462	0.000	0.000	0.0	0.000		48.995	OK

FEH: 10 years: +0 %: 5760 mins: Winter	9.492	9.492	0.292	0.292	12.6	1727.572	0.000	0.000	0.0	0.000		42.874	OK
FEH: 10 years: +0 %: 7200 mins: Summer	9.478	9.478	0.278	0.278	14.9	1638.392	0.000	0.000	0.0	0.000		45.822	OK
FEH: 10 years: +0 %: 7200 mins: Winter	9.510	9.510	0.310	0.310	10.8	1834.781	0.000	0.000	0.0	0.000		39.328	OK
FEH: 10 years: +0 %: 8640 mins: Summer	9.492	9.492	0.292	0.292	13.0	1723.712	0.000	0.000	0.0	0.000		43.001	OK
FEH: 10 years: +0 %: 8640 mins: Winter	9.525	9.525	0.325	0.325	9.4	1930.588	0.000	0.000	0.0	0.000		36.160	OK
FEH: 10 years: +0 %: 10080 mins: Summer	9.504	9.504	0.304	0.304	11.7	1800.410	0.000	0.000	0.0	0.000		40.465	OK
FEH: 10 years: +0 %: 10080 mins: Winter	9.539	9.539	0.339	0.339	8.4	2017.014	0.000	0.000	0.0	0.000		33.302	OK

Catchment Area 1B Type : Catchment Area

Area (ha)	5.774

Preliminary Sizing

Volumetric Runoff Coefficient	0.750
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Catchment Area 1A Type : Catchment Area

Area (ha)	2.096

Preliminary Sizing

Volumetric Runoff Coefficient	0.750
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.750
Winter Volumetric Runoff	0.750
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Pond 1B

Type : Pond

Dimensions

Exceedance Level (m)	10.000
Depth (m)	0.800
Base Level (m)	9.200
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	6.02
Total Volume (m³)	6296.953

Depth (m)	Area (m²)	Volume (m³)
0.000	12000.00	0.000
0.800	13943.00	10367.485

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 1B
Bypass Destination	(None)
Capacity Type	No Restriction

Advanced

Perimeter	Circular
Length (m)	270.052
Friction Scheme	Manning's n
n	0.03

Pond 1A

Type : Pond

Dimensions

Exceedance Level (m)	10.000
Depth (m)	1.500
Base Level (m)	8.500
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	6.676
Total Volume (m³)	2151.352

Depth (m)	Area (m²)	Volume (m³)
0.000	1228.00	0.000
1.500	2787.00	2932.491

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area 1A
Bypass Destination	(None)
Capacity Type	No Restriction

Advanced

Perimeter	Circular
Length (m)	130.986
Friction Scheme	Manning's n
n	0.03

FEH: 10 years: Increase Rainfall (%): +0: Summary Results for Pond 1B: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 10 years: +0 %: 15 mins: Summer	9.329	9.232	0.129	0.032	1647.5	744.805	0.000	0.000	0.0	0.000		88.172	OK
FEH: 10 years: +0 %: 15 mins: Winter	9.337	9.248	0.137	0.048	1736.0	834.526	0.000	0.000	0.0	0.000		86.747	OK
FEH: 10 years: +0 %: 30 mins: Summer	9.335	9.280	0.135	0.080	1102.1	959.179	0.000	0.000	0.0	0.000		84.768	OK
FEH: 10 years: +0 %: 30 mins: Winter	9.341	9.289	0.141	0.089	1158.4	1074.539	0.000	0.000	0.0	0.000		82.936	OK
FEH: 10 years: +0 %: 60 mins: Summer	9.331	9.298	0.131	0.098	940.7	1175.591	0.000	0.000	0.0	0.000		81.331	OK
FEH: 10 years: +0 %: 60 mins: Winter	9.330	9.309	0.130	0.109	847.3	1316.728	0.000	0.000	0.0	0.000		79.089	OK
FEH: 10 years: +0 %: 120 mins: Summer	9.318	9.317	0.118	0.117	668.4	1408.413	0.000	0.000	0.0	0.000		77.633	OK
FEH: 10 years: +0 %: 120 mins: Winter	9.330	9.330	0.130	0.130	538.7	1577.405	0.000	0.000	0.0	0.000		74.950	OK
FEH: 10 years: +0 %: 180 mins: Summer	9.327	9.327	0.127	0.127	517.7	1545.072	0.000	0.000	0.0	0.000		75.463	OK
FEH: 10 years: +0 %: 180 mins: Winter	9.342	9.342	0.142	0.142	399.6	1730.513	0.000	0.000	0.0	0.000		72.518	OK
FEH: 10 years: +0 %: 240 mins: Summer	9.335	9.335	0.135	0.135	426.1	1644.488	0.000	0.000	0.0	0.000		73.884	OK
FEH: 10 years: +0 %: 240 mins: Winter	9.351	9.351	0.151	0.151	321.0	1841.853	0.000	0.000	0.0	0.000		70.750	OK
FEH: 10 years: +0 %: 360 mins: Summer	9.347	9.347	0.147	0.147	317.3	1792.024	0.000	0.000	0.0	0.000		71.541	OK
FEH: 10 years: +0 %: 360 mins: Winter	9.365	9.365	0.165	0.165	234.1	2007.085	0.000	0.000	0.0	0.000		68.126	OK

FEH: 10 years: +0 %: 480 mins: Summer	9.356	9.356	0.156	0.156	257.7	1899.432	0.000	0.000	0.0	0.000		69.836	OK
FEH: 10 years: +0 %: 480 mins: Winter	9.374	9.374	0.174	0.174	186.7	2127.409	0.000	0.000	0.0	0.000		66.215	OK
FEH: 10 years: +0 %: 600 mins: Summer	9.363	9.363	0.163	0.163	216.2	1985.248	0.000	0.000	0.0	0.000		68.473	OK
FEH: 10 years: +0 %: 600 mins: Winter	9.382	9.382	0.182	0.182	156.2	2223.465	0.000	0.000	0.0	0.000		64.690	OK
FEH: 10 years: +0 %: 720 mins: Summer	9.369	9.369	0.169	0.169	186.7	2057.233	0.000	0.000	0.0	0.000		67.330	OK
FEH: 10 years: +0 %: 720 mins: Winter	9.389	9.389	0.189	0.189	134.9	2304.123	0.000	0.000	0.0	0.000		63.409	OK
FEH: 10 years: +0 %: 960 mins: Summer	9.378	9.378	0.178	0.178	148.0	2175.007	0.000	0.000	0.0	0.000		65.459	OK
FEH: 10 years: +0 %: 960 mins: Winter	9.399	9.399	0.199	0.199	107.0	2436.045	0.000	0.000	0.0	0.000		61.314	OK
FEH: 10 years: +0 %: 1440 mins: Summer	9.393	9.393	0.193	0.193	107.2	2363.327	0.000	0.000	0.0	0.000		62.469	OK
FEH: 10 years: +0 %: 1440 mins: Winter	9.416	9.416	0.216	0.216	77.5	2647.028	0.000	0.000	0.0	0.000		57.963	OK
FEH: 10 years: +0 %: 2160 mins: Summer	9.411	9.411	0.211	0.211	78.1	2580.253	0.000	0.000	0.0	0.000		59.024	OK
FEH: 10 years: +0 %: 2160 mins: Winter	9.435	9.435	0.235	0.235	56.4	2889.952	0.000	0.000	0.0	0.000		54.106	OK
FEH: 10 years: +0 %: 2880 mins: Summer	9.425	9.425	0.225	0.225	62.5	2755.774	0.000	0.000	0.0	0.000		56.236	OK
FEH: 10 years: +0 %: 2880 mins: Winter	9.451	9.451	0.251	0.251	45.2	3086.710	0.000	0.000	0.0	0.000		50.981	OK
FEH: 10 years: +0 %: 4320 mins: Summer	9.447	9.447	0.247	0.247	46.0	3039.931	0.000	0.000	0.0	0.000		51.724	OK
FEH: 10 years: +0 %: 4320 mins: Winter	9.476	9.476	0.276	0.276	33.2	3404.728	0.000	0.000	0.0	0.000		45.931	OK
FEH: 10 years: +0 %: 5760 mins: Summer	9.467	9.467	0.267	0.267	37.3	3284.851	0.000	0.000	0.0	0.000		47.834	OK

FEH: 10 years: +0 %: 5760 mins: Winter	9.498	9.498	0.298	0.298	26.9	3679.121	0.000	0.000	0.0	0.000		41.573	OK
FEH: 10 years: +0 %: 7200 mins: Summer	9.486	9.486	0.286	0.286	32.0	3529.494	0.000	0.000	0.0	0.000		43.949	OK
FEH: 10 years: +0 %: 7200 mins: Winter	9.519	9.519	0.319	0.319	23.2	3952.964	0.000	0.000	0.0	0.000		37.224	OK
FEH: 10 years: +0 %: 8640 mins: Summer	9.504	9.504	0.304	0.304	28.4	3759.209	0.000	0.000	0.0	0.000		40.301	OK
FEH: 10 years: +0 %: 8640 mins: Winter	9.540	9.540	0.340	0.340	20.5	4210.644	0.000	0.000	0.0	0.000		33.132	OK
FEH: 10 years: +0 %: 10080 mins: Summer	9.521	9.521	0.321	0.321	25.8	3975.524	0.000	0.000	0.0	0.000		36.866	OK
FEH: 10 years: +0 %: 10080 mins: Winter	9.558	9.558	0.358	0.358	18.6	4452.703	0.000	0.000	0.0	0.000		29.288	OK

Project: One Earth Solar Farm Fire Water Scenario	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 10 years: Increase Rainfall (%): +0: Summary Results for Pond 1A: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 10 years: +0 %: 15 mins: Summer	8.705	8.705	0.205	0.205	598.1	269.482	0.000	0.000	0.0	0.000		87.474	OK
FEH: 10 years: +0 %: 15 mins: Winter	8.705	8.705	0.205	0.205	562.7	269.434	0.000	0.000	0.0	0.000		87.476	OK
FEH: 10 years: +0 %: 30 mins: Summer	8.759	8.759	0.259	0.259	400.1	346.595	0.000	0.000	0.0	0.000		83.889	OK
FEH: 10 years: +0 %: 30 mins: Winter	8.759	8.759	0.259	0.259	375.5	346.631	0.000	0.000	0.0	0.000		83.888	OK
FEH: 10 years: +0 %: 60 mins: Summer	8.813	8.813	0.313	0.313	341.5	426.754	0.000	0.000	0.0	0.000		80.163	OK
FEH: 10 years: +0 %: 60 mins: Winter	8.813	8.813	0.313	0.313	274.6	426.774	0.000	0.000	0.0	0.000		80.163	OK
FEH: 10 years: +0 %: 120 mins: Summer	8.869	8.869	0.369	0.369	242.6	511.293	0.000	0.000	0.0	0.000		76.234	OK
FEH: 10 years: +0 %: 120 mins: Winter	8.869	8.869	0.369	0.369	174.6	511.271	0.000	0.000	0.0	0.000		76.235	OK
FEH: 10 years: +0 %: 180 mins: Summer	8.900	8.900	0.400	0.400	187.9	560.894	0.000	0.000	0.0	0.000		73.928	OK
FEH: 10 years: +0 %: 180 mins: Winter	8.900	8.900	0.400	0.400	129.5	560.892	0.000	0.000	0.0	0.000		73.928	OK
FEH: 10 years: +0 %: 240 mins: Summer	8.923	8.923	0.423	0.423	154.7	596.999	0.000	0.000	0.0	0.000		72.250	OK
FEH: 10 years: +0 %: 240 mins: Winter	8.923	8.923	0.423	0.423	104.0	596.998	0.000	0.000	0.0	0.000		72.250	OK
FEH: 10 years: +0 %: 360 mins: Summer	8.956	8.956	0.456	0.456	115.2	650.545	0.000	0.000	0.0	0.000		69.761	OK
FEH: 10 years: +0 %: 360 mins: Winter	8.956	8.956	0.456	0.456	75.9	650.545	0.000	0.000	0.0	0.000		69.761	OK

Project:
One Earth Solar Farm
Fire Water Scenario

Date:
19/02/2025

Designed by: S.Thorpe | Checked by: C.Thwaites | Approved By: C.Thwaites

Report Details:
Type: Stormwater Controls Summary
Storm Phase: Phase

Company Address:
24 Greville Street
Farringdon
EC1N 8SS

FEH: 10 years: +0 %: 480 mins: Summer	8.980	8.980	0.480	0.480	93.5	689.568	0.000	0.000	0.0	0.000		67.947	OK
FEH: 10 years: +0 %: 480 mins: Winter	8.980	8.980	0.480	0.480	60.5	689.559	0.000	0.000	0.0	0.000		67.948	OK
FEH: 10 years: +0 %: 600 mins: Summer	8.998	8.998	0.498	0.498	78.5	720.749	0.000	0.000	0.0	0.000		66.498	OK
FEH: 10 years: +0 %: 600 mins: Winter	8.998	8.998	0.498	0.498	50.6	720.721	0.000	0.000	0.0	0.000		66.499	OK
FEH: 10 years: +0 %: 720 mins: Summer	9.014	9.014	0.514	0.514	67.8	746.850	0.000	0.000	0.0	0.000		65.285	OK
FEH: 10 years: +0 %: 720 mins: Winter	9.014	9.014	0.514	0.514	43.7	746.855	0.000	0.000	0.0	0.000		65.284	OK
FEH: 10 years: +0 %: 960 mins: Summer	9.039	9.039	0.539	0.539	53.7	789.627	0.000	0.000	0.0	0.000		63.296	OK
FEH: 10 years: +0 %: 960 mins: Winter	9.039	9.039	0.539	0.539	34.7	789.618	0.000	0.000	0.0	0.000		63.297	OK
FEH: 10 years: +0 %: 1440 mins: Summer	9.078	9.078	0.578	0.578	38.9	858.030	0.000	0.000	0.0	0.000		60.117	OK
FEH: 10 years: +0 %: 1440 mins: Winter	9.078	9.078	0.578	0.578	25.1	858.047	0.000	0.000	0.0	0.000		60.116	OK
FEH: 10 years: +0 %: 2160 mins: Summer	9.123	9.123	0.623	0.623	28.3	936.843	0.000	0.000	0.0	0.000		56.453	OK
FEH: 10 years: +0 %: 2160 mins: Winter	9.123	9.123	0.623	0.623	18.3	936.744	0.000	0.000	0.0	0.000		56.458	OK
FEH: 10 years: +0 %: 2880 mins: Summer	9.158	9.158	0.658	0.658	22.7	1000.549	0.000	0.000	0.0	0.000		53.492	OK
FEH: 10 years: +0 %: 2880 mins: Winter	9.158	9.158	0.658	0.658	14.7	1000.522	0.000	0.000	0.0	0.000		53.493	OK
FEH: 10 years: +0 %: 4320 mins: Summer	9.213	9.213	0.713	0.713	16.7	1103.955	0.000	0.000	0.0	0.000		48.686	OK
FEH: 10 years: +0 %: 4320 mins: Winter	9.213	9.213	0.713	0.713	10.8	1103.675	0.000	0.000	0.0	0.000		48.699	OK
FEH: 10 years: +0 %: 5760 mins: Summer	9.260	9.260	0.760	0.760	13.5	1192.806	0.000	0.000	0.0	0.000		44.556	OK

Project: One Earth Solar Farm Fire Water Scenario	Date: 19/02/2025		
	Designed by: S.Thorpe	Checked by: C.Thwaites	Approved By: C.Thwaites
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: 24 Greville Street Farringdon EC1N 8SS		

FEH: 10 years: +0 %: 5760 mins: Winter	9.260	9.260	0.760	0.760	8.7	1192.720	0.000	0.000	0.0	0.000		44.560	OK
FEH: 10 years: +0 %: 7200 mins: Summer	9.305	9.305	0.805	0.805	11.6	1281.661	0.000	0.000	0.0	0.000		40.425	OK
FEH: 10 years: +0 %: 7200 mins: Winter	9.305	9.305	0.805	0.805	7.5	1281.326	0.000	0.000	0.0	0.000		40.441	OK
FEH: 10 years: +0 %: 8640 mins: Summer	9.347	9.347	0.847	0.847	10.3	1365.074	0.000	0.000	0.0	0.000		36.548	OK
FEH: 10 years: +0 %: 8640 mins: Winter	9.346	9.346	0.846	0.846	6.7	1364.761	0.000	0.000	0.0	0.000		36.563	OK
FEH: 10 years: +0 %: 10080 mins: Summer	9.385	9.385	0.885	0.885	9.4	1443.947	0.000	0.000	0.0	0.000		32.882	OK
FEH: 10 years: +0 %: 10080 mins: Winter	9.385	9.385	0.885	0.885	6.0	1443.667	0.000	0.000	0.0	0.000		32.895	OK

Logika
GROUP

London • Bristol • Warrington • Brussels

one earth
solar farm