EAST YORKSHIRE SOLAR FARM

East Yorkshire Solar Farm

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Environmental Statement

Volume 2, Appendix 9-3: Flood Risk Assessment, Annexes
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Planning Act 2008

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East Yorkshire Solar Farm

Volume 2, Appendix 9-3: Flood Risk Assessment Annexes

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Prepared for:

East Yorkshire Solar Farm Limited

Prepared by:

AECOM Limited

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Annex A Flood Modelling Method Statement

East Yorkshire Solar Farm

Flood Modelling Method Statement

East Yorkshire Solar Farm Ltd

Project reference: EYSF
Project number: 60683115

July 2023

Delivering a better world

Project reference: EYSF
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Quality information

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1. Introduction

AECOM has been commissioned by East Yorkshire Solar Farm Ltd to prepare a Flood Risk Assessment (FRA) to support an application for a Development Consent Order for the construction, operation (including maintenance) and decommissioning of ground mounted solar photovoltaic (PV) panel arrays and supporting infrastructure including electrical equipment and cabling. The Scheme is located within the administrative areas of East Riding of Yorkshire Council and North Yorkshire Council, approximately 1.4km northwest of the market town of Howden. A Grid Connection Corridor is proposed with a point of connection at the National Grid Drax Substation. Due to its proposed generating capacity being above 50 Megawatts the Scheme is classified as a Nationally Significant Infrastructure Supply Project (NSIP) and requires a Development Consent Order (DCO) under the Planning Act 2008.

The Scheme is located approximately 1.4km northwest of the market town of Howden. The location of the Scheme is shown in **Figure 1**. It should be noted that this is not the final boundary of the Scheme, and it may be amended following consultation and through the design process prior to the DCO Application.

There are a number of watercourses that transect the Site boundary. This includes the principal watercourses of the River Ouse and River Derwent which area designated as Main Rivers and therefore fall under the jurisdiction of the Environment Agency (EA). There are also a number of ordinary watercourses that cross the Site boundary including the River Foulness which is located on the western boundary (**Figure 1**). Please refer to Appendix A to review the Flood Map for Planning Flood Zone 2 and 3 outlines[1]

1.1 Purpose of the Modelling Method Statement

Following a discussion with the EA it was determined that flood modelling was required to support the DCO application following an update to the climate change guidance. This Flood Modelling Method Statement provides an overview of the suitability of the available data and sets out the proposed methodology to enable updated flood outlines to be produced and consequently inform the design and manage residual flood risk and be presented in the FRA. Items on which confirmation is sought from the EA are presented in Section 4.

[1] https://check-long-term-flood-risk.service.gov.uk/map

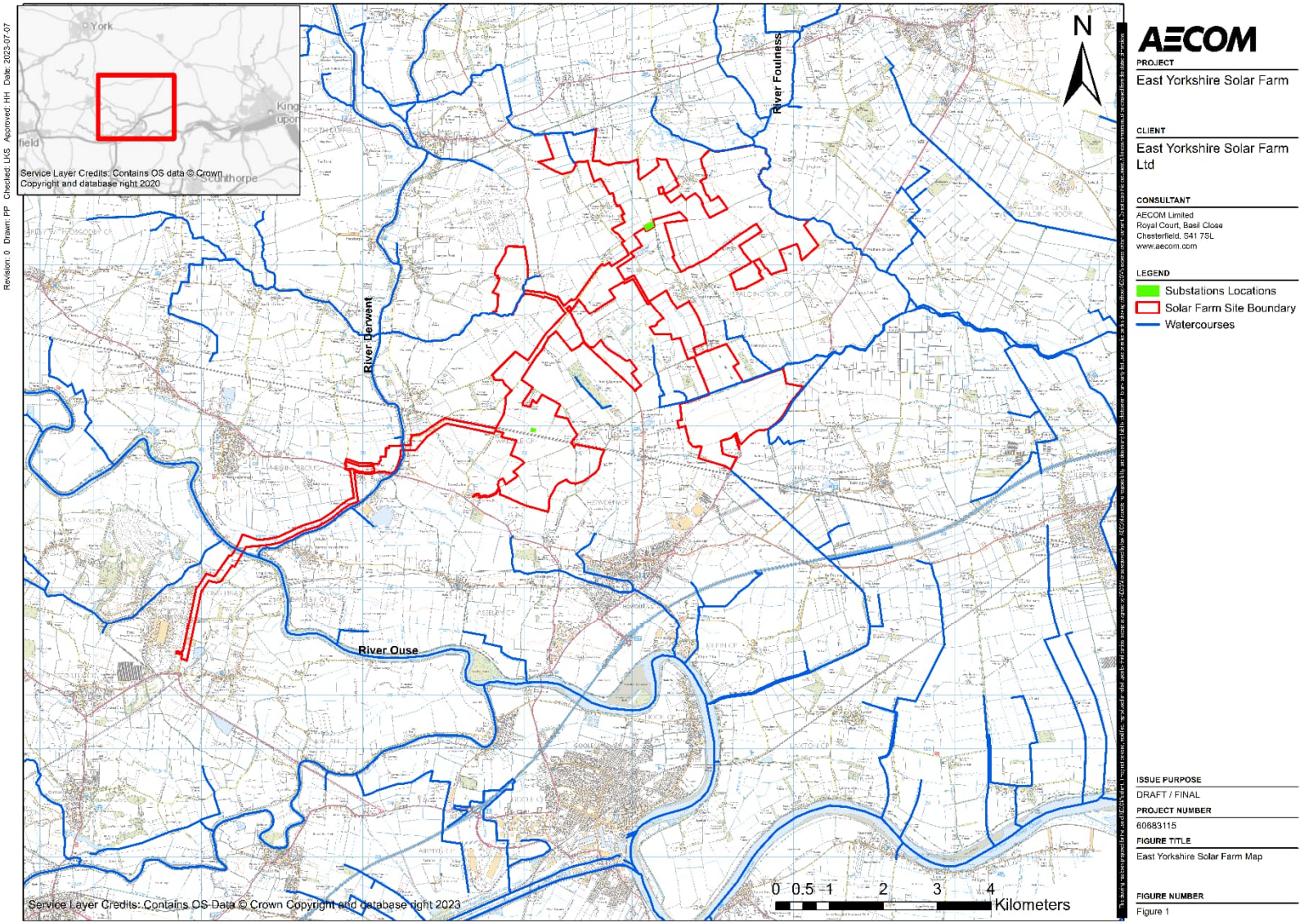


Figure 1 – Proposed Location of the East Yorkshire Solar Farm

2. Data Review

An overview of the available data for review is presented in **Table 1**.

Table 1 – Available Data

Data	Source	Description
The Lower Derwent Study Model (2005)	EA	A 1D unsteady HEC RAS model.
Upper Humber Modelling Study (2016)	EA	An ISIS-TUFLOW model (1D-2D linked).
The Lower Derwent Model (2016)	East Riding of Yorkshire Council (ERYC)	A 1D-2D integrated InfoWorks ICM model.
EA Model Reports	EA	The following model reports were received: ▪ Humber Tributaries Final Report (JBA, 2021) ▪ Lower Derwent Study – Final Report (JBA, 2005). ▪ Lower Derwent Hydraulic and Water Quality Modelling Report (JBA, 2000). ▪ Lower Derwent Hydrological Modelling Final Report (JBA, 2000).
ERYC Report	ERYC	Lower Derwent Catchment FRMP Stage 2 Report (Capita, 2016).

2.1 EA Models

The Lower Derwent Study Model (2005) and Upper Humber Modelling Study (2016) models were provided by the EA. The extent of the model boundaries are presented in **Figure 2**. It was initially intended to use the EA approved Lower Derwent Model as a basis for the project, however, due to unforeseen technical difficulties (unable to run the model) an alternative model has been selected for use in this project (see section 2.2 EYRC model).

The Upper Humber Model was created as a 1D/2D ISIS-TUFLOW model. It includes the Upper Humber estuary and major tributaries and was developed to provide a strategic understanding of both fluvial and tidal flood risk. The model includes undefended, defended and breach scenarios. The model scenarios included joint probability analysis (fluvial and tidal), fluvial dominant and tidal dominant.

A summary of the model review is provided in **Table 2**.

Table 2 – Upper Humber Model Review

Review Item	Comments
Software Version	The model is currently in ISIS version 3.7.2, and TUFLOW version 2013-12-AD.
Model Data	The Upper Humber Model was spliced together from four different models, the newest of the models being from 2013. Considering the age of this model, if this is to be used as part of this project, it may be prudent to obtain check survey to enable a more detailed review of the model geometry data before progressing further. Ground model data is derived from 2m LiDAR, Due to the age of the model, having been developed in

Review Item	Comments
	2016, it is possible that newer LiDAR may be available and therefore should be updated. The model mesh is suitably coarse for a strategic understanding of flood risk, however this could be refined further to provide greater accuracy of flow paths.
Model Extent	The 2D model boundary covers the southern part of the scheme area, therefore it would require extending to encompass the entirety of the scheme.
Schematisation	1D river sections are reasonable (bed and bank profiles), however due to the age of the models that the Upper Humber Model is based on, check survey may be required to provide confidence in survey results.
Results	Results show that flooding occurs on the southern end of the scheme, however no flooding is present at the southern substation. Updated hydrology may be required to highlight any potential change in flood risk, if hydrology updates yield a higher rate of flow.

2.1.1 Hydrology

A number of design events were simulated for the Upper Humber Model which included the 3.33% AEP, 1.33% AEP, 1% AEP, 0.5% AEP, 0.1% AEP and 1% AEP + 20% climate change events, however, not all these were simulated for each scenario. Climate change allowances have been simulated only for the fluvial and tidal dominant defended scenarios. These have been applied prior to the updated climate change guidance provided by the EA[2].

2.2 ERYC Model

The Lower Derwent Model (2016) is a 1D/2D integrated model and was developed in InfoWorks ICM version 6.5. The model extends from Kirkham Abbey to the North and Barmby Barrage to the South. The baseline model was developed from a number of existing hydraulic models, namely the Foss Beck Model (2006), Howden Flood Mapping Study (2006), Howden Pumping Stations PAR (2014), Lower Derwent Model (2005) and Pocklington Data Improvements Study (2011-2014). For this reason it was determined appropriate for use in this study as the model utilises data from the EA approved Lower Derwent Study Model (2005).

A summary of the model review is provided in **Table 3**.

Table 3 – ERYC Hydraulic Model Reivew

Review Item	Comments
Software Version	The model is currently in ICM version 6.5 this has subsequently been superseded (ICM version 2024).
Model Data	The model utilises data from 5 previous hydraulic modelling studies as well as additional survey data. A Digital Terrain Model (DTM) was produced using a combination of 1m and 2m LiDAR datasets, newer data is likely to be available. The model mesh is suitably coarse for a strategic understanding of flood risk, however this could be refined further to provide greater accuracy of flow paths.
Model Extent	The 2D model boundary requires extending to include the eastern extents of the Scheme. The upstream and downstream extents are appropriate.
Schematisation	1D river sections are reasonable (bed and bank profiles), however, the River Derwent survey data originates from 1998 with limited additional

[2] Updated climate change allowances for peak rainfall intensities (https://www.gov.uk/government/publications/peak-rainfall-climate-change-allowances-by-management-catchment) and peak river flow (https://www.gov.uk/government/publications/peak-river-flow-climate-change-allowances-by-management-catchment)

Review Item	Comments
	survey collected since. The construction of river junctions is no longer in line with latest industry standards and needs revising.
Results	No results were provided for review.

2.2.1 Hydrology

An inflow hydrograph has been applied to the upstream boundary of the River Derwent coupled with baseflows applied to the following drains; Howden, Pocklington Beck, Millington Beck and Foss Beck. Baseflows were adjusted to achieve 95% exceedance flows at Sandhill Bridge and Thornton Lock gauges. For calibration events the Buttercrambe gauge was used for upstream inflows for the River Derwent.

The downstream extent is tidal bound by the River Ouse and as such has been represented in the model using a flap valve. Historical data from the gauge located at Barmby Barrage was used for calibration events and the most recent extreme high tide (February 2014) was used for design events.

The 2D model inputs utilise a direct rainfall approach. This enables excess surface runoff to be directed using the underlying DTM. A normal depth boundary has been applied to the 2D zone to enable flows to leave the model boundary. Infiltration has been applied to the 2D zone using either a fixed runoff surface (applied to urban extents) or using the Horton infiltration model (applied to rural areas). The Horton infiltration model enables the rate of infiltration to reduce as the storm progresses. The parameters have been varied depending on the underlying soil type.

The model was simulated for the following design rainfall events, 3.3% AEP, 1% AEP and 0.1% AEP and 1% AEP with climate change (3 epochs: 2020, 2050 and 2080).

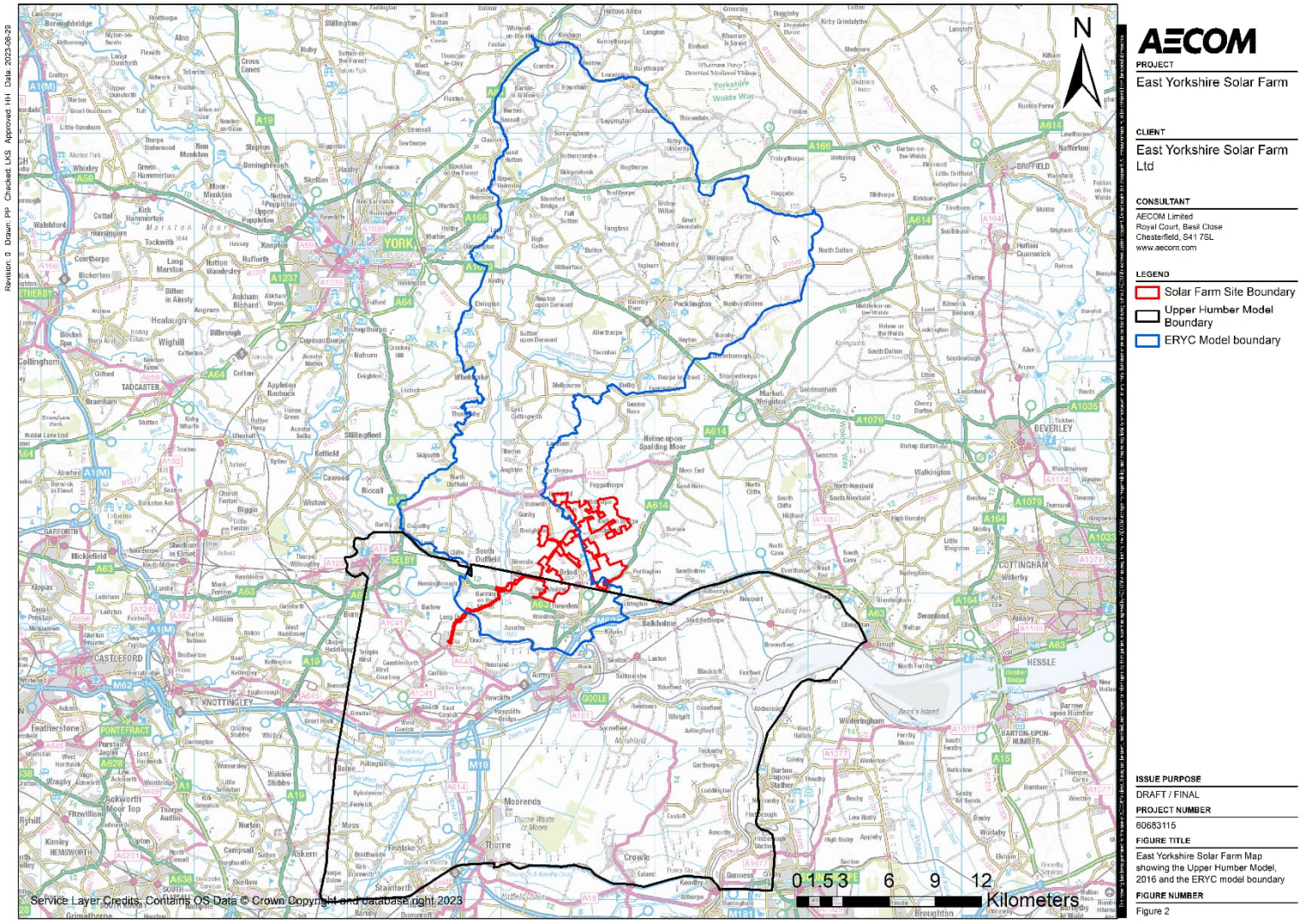


Figure 2 - Comparison of Model Boundaries.

3. Modelling Methodology

Following a review of the hydraulic models outlined in the above section in the context of the proposed scheme and the intended planning process, it was determined that the ERYC Model (2016) will be used as a basis for this study. All of the above ground elements of the scheme located within Flood Zone 2 and Flood Zone 3 are covered by the extent of the ERYC model (refer to Appendix B). Outputs from the ERYC model will be used to inform flood risk to the Scheme.

3.1 Hydraulic Modelling

In order to determine the flood outlines and depths to inform the position of flood sensitive infrastructure, model runs are required for the following scenarios;

- Updated Climate Change Scenario;
- Credible Maximum Scenario (H++).

It is proposed that these will be applied to the baseline ERYC model. The H++ scenario is a requirement for NSIPs and will be treated as a sensitivity scenario to test if the Scheme is resilient to large changes in flood risk.

3.1.1 Proposed Model Updates

Following a review of the ERYC model the following updates are proposed;

- Update to latest model software version;
- Extension of the 2D model boundary to include the Scheme and surrounding areas;
- Update DTM using best available LiDAR (1m);
- Update 1D river junctions in line with latest industry standards;
- Addition of known culverts underneath the railway line located north of Howden to enable flows to pass through the railway embankment (information to be provided by the client).
- Refinement of the 2D mesh, where appropriate (addition of breaklines).

3.2 Hydrology

The Scheme is designated as “Essential Infrastructure” and therefore requires the use of the Upper climate change allowances[3]. A ‘credible maximum scenario’ (H++) also needs testing. The relevant climate change uplifts detailed in the following subsections have been determined using the appropriate river basin districts[4].

3.2.1 Updated Climate Change Scenario

The proposed climate change uplifts are presented in **Table 4**.

Table 4 – Climate Change Allowances (2080 epoch) applied to the 1% AEP event

	River Derwent Uplifts	River Derwent Scenario
River Flow	54%	Upper

[3] Guidance on flood risk vulnerability classification can be found here:https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification

[4] Guidance on climate change uplifts by river basin district is available here:https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

	River Derwent Uplifts	River Derwent Scenario
Peak Rainfall Intensity	40%	Upper end allowance
Tidal Level Increase	1.15m	Higher Central

3.2.2 Credible Maximum Scenario (H++)

The proposed uplifts for the H++ scenario are presented in **Table 5**.

Table 5 - Climate Change Allowances applied for the H++ scenario

	River Derwent Uplifts	River Derwent Scenario
River Flow	54%	Upper
Peak Rainfall Intensity	40%	Upper end allowance
Tidal Level Increase	1.9m	H++

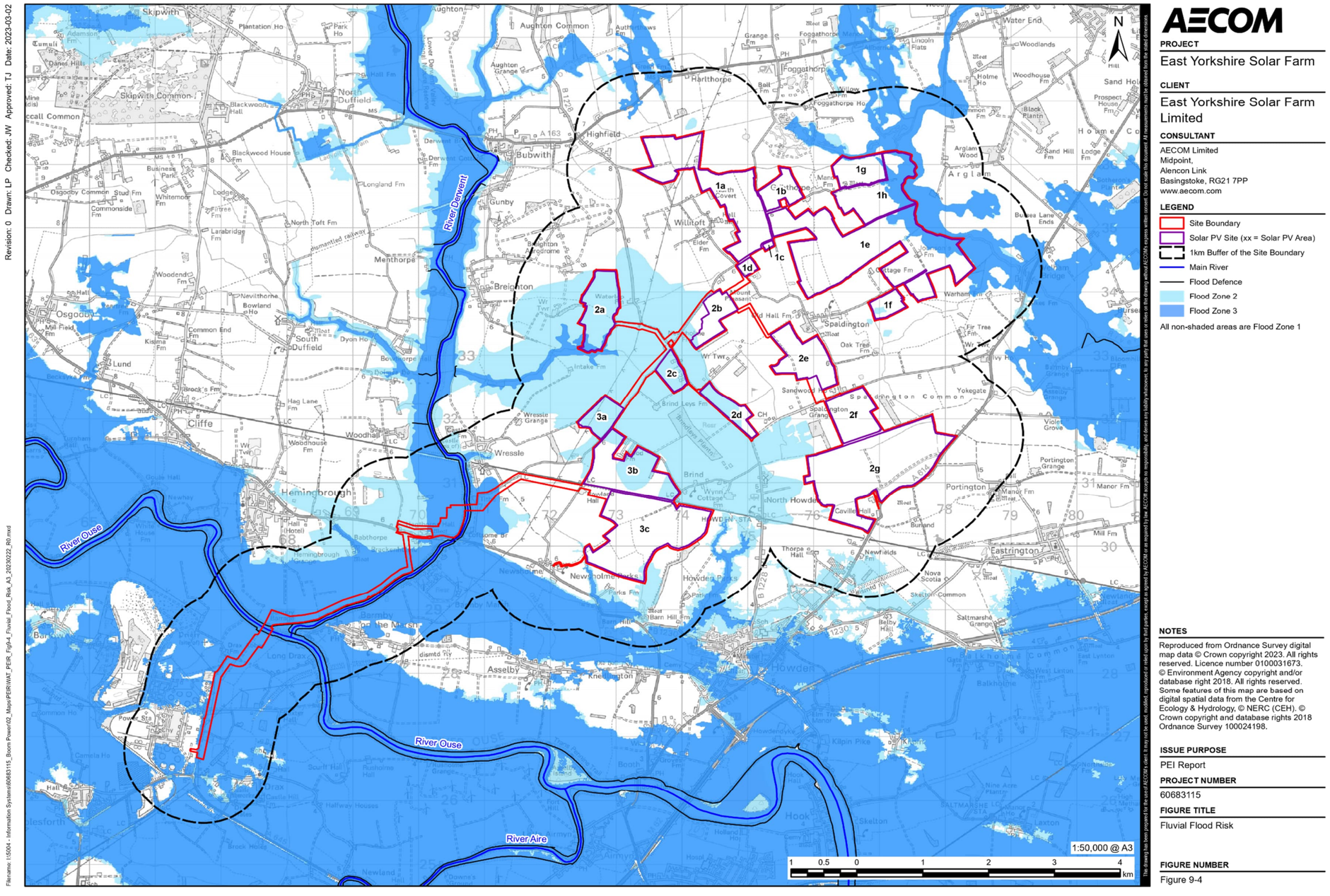
4. Points Requiring EA Agreement

This technical note has summarised the findings of the model reviews and provided a modelling methodology to derive updated flood outlines that can be used to inform the Scheme layout and residual mitigation. Flood levels predicted by the model will be used to inform the proposed elevations for flood sensitive infrastructure. **Table 6** outlines the proposed elements that require agreement from the EA.

Table 6 – Proposed points requiring agreement from the EA

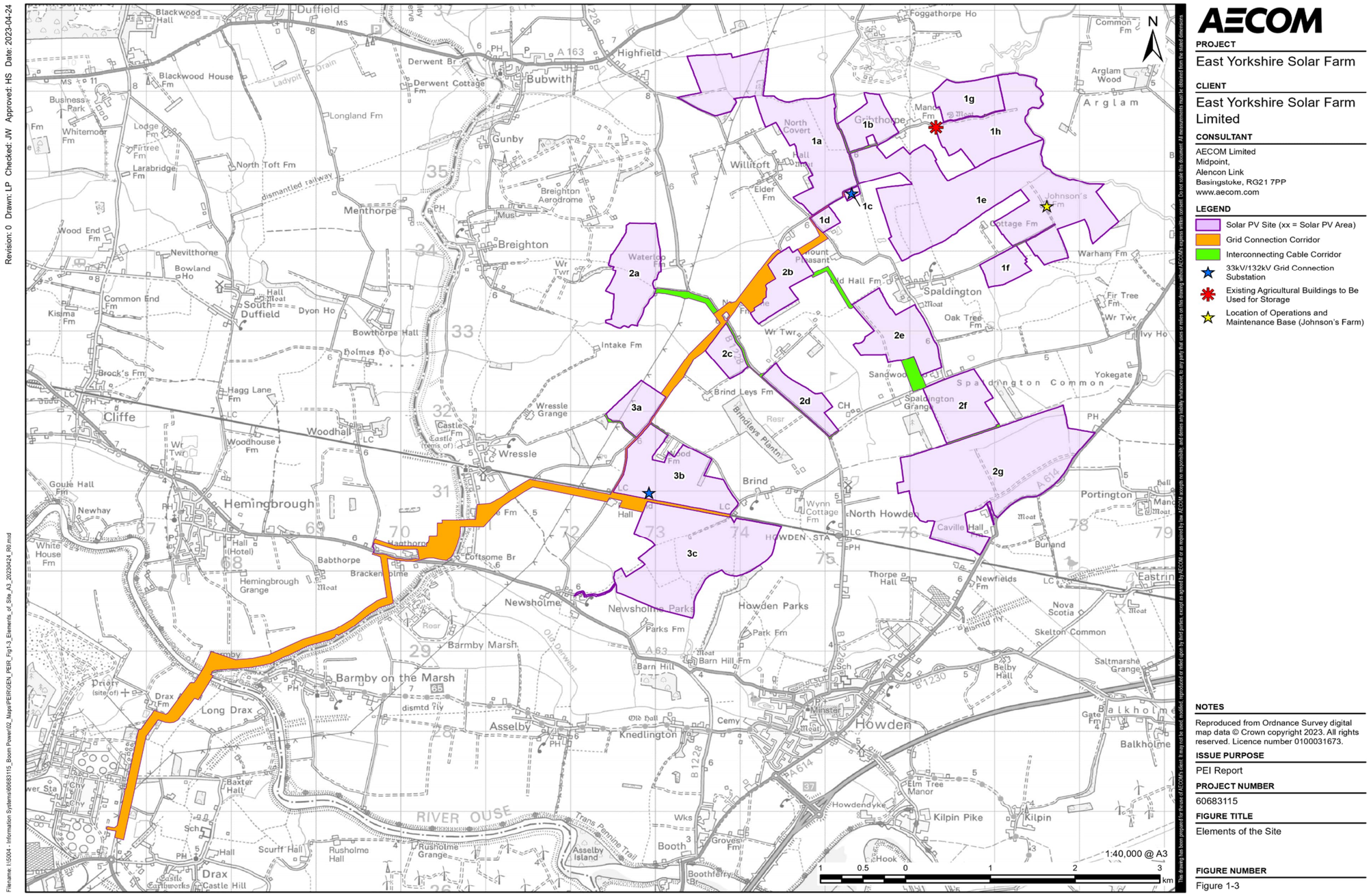
Theme	Items
Modelling	▸ Confirmation that the proposed updates to the ERYC model are acceptable. ▸ Confirmation that no additional model scenarios are required.
Hydrology	▸ Confirmation that the climate change uplifts are appropriate. ▸ Confirmation that the climate change uplifts for the H++ scenario are appropriate.

Appendix A – Fluvial Flood Risk



Note: Reproduced from Figure 9-4 of the Preliminary Environmental Information Report.

Appendix B - Elements of the Scheme



Note: Reproduced from Figure 1-3 of the Preliminary Environmental Information Report.

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Annex B Hydraulic Modelling Technical Report

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1. Introduction

1.1.1 AECOM has been commissioned by East Yorkshire Solar Farm Ltd to prepare a Flood Risk Assessment (FRA) to support an application for a Development Consent Order for the construction, operation (including maintenance) and decommissioning of ground mounted solar photovoltaic (PV) panel arrays and supporting infrastructure including electrical equipment and cabling (the Scheme). The Scheme is located within the administrative areas of East Riding of Yorkshire Council and North Yorkshire Council, approximately 1.6km northwest of the market town of Howden. A Grid Connection Corridor is proposed with a point of connection at the National Grid Drax Substation. Due to its proposed generating capacity being above 50 Megawatts the Scheme is classified as a Nationally Significant Infrastructure Supply Project (NSIP) and requires a Development Consent Order (DCO) under the Planning Act 2008. The Scheme is located approximately 1.4km northwest of the market town of Howden. The location of the Scheme (hereafter referred to as the Site) is shown edged red in Figure 1 below.

1.1.2 This technical note outlines the hydraulic model build and results analysis undertaken to establish the fluvial flood risk for the Scheme to support the FRA. The East Riding of Yorkshire Lower Derwent Infoworks ICM model, developed in 2016, forms the basis of this study. The following sections outline the updates undertaken to the model to enable flood risk to be assessed for the Site and the subsequent results of the model simulations.

1.1.3 A method statement was submitted to the Environment Agency (EA) for approval on 13th July 2023. Approval was received via email on 8th August 2023 confirming the acceptability of the approach for the Site. The methodology statement is included within Annex A of the FRA and should be referred to in conjunction with this technical note.

2. Modelling

2.1 East Riding of Yorkshire Model Review and Updates

2.1.1 The following table (Table 1) describes the updates made to the latest hydraulic model in order to use the most up to date information and provide additional detail at the EYSF Site.

Table 1. Updates Made to the Hydraulic Model

Update	Description
New ground model (DTM-Updated)	A new ground model was created using the latest LiDAR data downloaded from the Defra Data Services Platform. The latest LiDAR was flown in 2022 and has a grid size of 1m.
ICM version 2024.0	The model was updated in ICM software version 2024.0
Model Stability updates	In order to provide a more accurate representation of flooding in the area of interest, effort was made to improve upon the stability by addressing existing warnings in the model validation process. These warnings mainly linked to adding more panel markers to cross sections, where roughness values vary greater than 20% and updating river reach bank lines with existing bank line data in the model that did not match.
Junction updates	Ten junctions were updated, to make use of a newer functionality in ICM within the model to better represent flow between the river reaches, to ensure that river reaches interacted correctly with each other and that out-of-bank flooding interacted with the 1D river reaches.
2D Zone extended	The 2D zone has been extended to encompass the EYSF Site boundary to enable flood risk to be assessed for the Site.
Climate change	Since 2018 the guidance on climate change has been updated for both peak rainfall intensity and river flows; incorporating UKCP18 data. The Site is located in Flood Zone 3, is classified as a ‘Less Vulnerable’ development type and has an expected lifetime of 75 years. In these situations, the ‘upper’ climate change allowances are appropriate[1]. The Site falls within the Humber and East Riding Management catchment. Using the information above and with reference to the Department for Environment, Food and Rural Affairs (DEFRA) Climate Change

[1] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Update	Description
	Allowances[2], the climate change allowances on peak rainfall intensity is +40% (2080's epoch), the climate change allowance on peak river flows is +54% (2080's epoch). The climate change allowance on tidal level is +1.15m (2080's epoch). The tidal level increase has been applied to the spring high tide profile that was present in the Lower Derwent Hydraulic Model, for the climate change events. The credible maximum scenario also needed to be tested with this hydraulic model, which used the H++ tidal level increase of +1.9m, along with the 2080's epoch for peak rainfall intensity (+40%) and peak flow (+54%).

2.2 Simulations

2.2.1 The updated model has been simulated for the following events:

a. the 3.3% AEP,

b. 1% AEP,

c. 1% AEP climate change scenario,

d. 1% AEP plus climate change, with H++ tidal level (Credible Maximum Scenario).

2.2.2 These events were simulated in the updated integrated model to allow for a comparison with Flood Zone 3b, Flood Zone 2, and to assess the potential impact of climate change.

2.2.3 The duration of the rainfall event within the simulation is 35 hour storm. The inflow hydrograph for the River Derwent has a duration of 15 days, with an initial peak flow approximately 12 hours into the model simulation. The hydraulic model runs for 5760 minutes (4 days), which is sufficient to allow the flooding to peak and recede on the EYSF Site. The model timestep is 2 seconds, with a results timestep of 15 minutes. No other changes from the default parameters were made.

2.3 Assumptions and Limitations

2.3.1 As part of the updates to the model the following assumptions have been made:

a. Assumptions in the original setup of the model inflows are still valid, with the exception of climate change representation which has been updated as described here

b. It is assumed that the roughness values and infiltration zones present in the model are still acceptable and therefore have not been updated.

[2] '*DEFRA Climate Change Allowances'* available at Climate change allowances for peak river flow in England (data.gov.uk), accessed 19th March 2023.

2.3.2 Following the updates made to the model, described above, the following limitations are still noted in the modelling:

a. Cross section geometry of river reaches mainly originates from 2006 survey data. However, due to a lack of more recent survey data, this has remained in the model,

b. Due to the size of the model, the 2D mesh is of a coarse size to enable reasonable model run time as such triangle sizes range from 800m^2 to 100,000m^2. This has been improved using terrain sensitive meshing.

2.4 Model Results

2.4.1 The model results show that, in the 1% AEP event the majority of the Site is not at risk of flooding and is not impacted by the modelled flood extents (Figure 1). There are smaller areas where modelled flooding encroaches on the area of interest, reaching maximum depths of between 0.1m and 0.7m, adjacent to the River Foulness, where the rainfall applied to the model, accumulates on the Site, next to the watercourse. The main flooding mechanisms originate from the River Derwent, where the watercourse reached capacity and overflows into Fleet Dike, extending across into the area of interest, reaching depths of 0.3m, outside of ditches within the area of interest. A further main flooding mechanism originates at the Feathered Drain, shown in Figure 1. This drain routes flood water directly to the rail line, where the flood water pools and flows westward, reaching depths of up to 0.3m, within the area of interest. Parts of the area of interest, located directly adjacent to the River Derwent also experience flooding, reaching depths of up to 0.4m, this is due to the river reaching capacity and overflowing directly into the area of interest, however this poses no risk to the proposed Scheme as this part of the Scheme layout is for underground cabling only.

2.4.2 The modelled results for the 1% AEP + Climate Change scenario, seen in Figure 2, show an extent of flooding similar to that of the flooding in the 1% AEP event, with little impact to the area of interest. Along the west bank of the River Derwent, where the Site is next to the watercourse, model results show depths of flooding from the river in the impacted area between 0.1m and 1.7m. The proposals for this part of the Scheme area are for underground cabling only and therefore flooding does not pose any risk to the proposals in this location. The predominant flooding mechanisms from the Fleet Dike remain the same as was present in the 1% AEP, with maximum depths increasing to 0.7m. The depth of flooding present adjacent to the River Foulness is shown to increase to a maximum on 1.3m, inside the area of interest. This is due to the increased quantity of rainfall present in the climate change scenario. The risk of flooding from Feathered Drain also increases, to a maximum depth of 0.4m.

2.4.3 The model results present in the 1% AEP H++ event (‘credible maximum’ scenario), seen in Figure 3, shows a similar pattern of flooding to that in the previous events, with increases to downstream flooding, as the H++ scenario significantly increases tidal levels. With increased depths in this reach of the River Derwent, predicted flooding on Site reaches a maximum depth of up to 2.4m in the area where underground cables are proposed. The presence of flooding from the Fleet Dike, backing up from the River Derwent increases, posing risk to the area of interest, as depths reach a maximum of 1.1m. This

is due to the increased tidal influence as part of this scenario. The modelled flooding at the area of interest adjacent to the River Foulness remains unchanged, this area is not influenced by tidal levels. The impact of flooding from the Feathered Drain also remains unchanged from the other climate change scenario because this watercourse is not influenced by the downstream tidal levels.

2.4.4 When compared to the EA Flood Zone showing the risk of flooding from rivers and sea, the 1% AEP modelled extent from the integrated catchment model is similar to EA Flood Zone 3. Where the extent of flooding is different, this originates from ditches that are not represented in the modelling used to generate the EA Flood Zone for Risk of Flooding from Rivers and Sea, but is present in the EA Risk of Flooding from Surface Water mapping. There are slight differences in the extent of flooding at the edges of the flood outlines, likely due to differences in model mesh/geometry between this integrated catchment model and other models used by the EA for Flood Zone mapping.

2.5 Sensitivity Testing

2.5.1 A number of model sensitivity scenarios were simulated following discussion with the EA after their model review (November 2023) including:

a. Manning's Roughness +/- 20%;

b. Model inflows +/- 20%;

c. Rainfall percentage for the 2D Zone (changed from 1% to 100%); and

d. Improved representation of smaller watercourses within the Order Limits.

2.5.2 Results associated with these sensitivity scenarios have shown minimal impact on the model results within the Order Limits, where panels are proposed. This demonstrates further confidence that the model results and conclusions of the assessments made from them are not sensitive to assumptions and decisions made as part of the model setup. These results were shared with the EA in June 2024.

2.5.3 One final sensitivity scenario included improvements relating to the tidal boundaries at the downstream outfalls. Following the model review by the EA in November 2023, it was suggested that the tidal boundary had not been correctly applied to the two downstream outfalls. Consequently, a sensitivity scenario was simulated where the tidal boundary was correctly applied to the two downstream outfalls to understand whether this had an impact on the Site, where panels are proposed. This sensitivity scenario was simulated for the 1% AEP plus climate change event and the H++ credible maximum scenario.

2.5.4 For the 1% AEP plus climate change event, there was a change in flood extent and depth compared to previous results, however this was located to the south of the railway line with minimal impact experienced within the Order Limits, where panels are proposed.

2.5.5 For the H++ credible maximum scenario, the most significant changes in results were located to the south of the railway line. There were some localised changes within Solar PV Area 2a where the flood extent had increased however flood depths generally remain below 0.30m.

2.5.6 Overall this particular sensitivity scenario has not changed the results significantly within the Order Limits (where panels are proposed) and consequently this has not changed the conclusions of the assessment.

2.5.7 Based on these results, it was not deemed necessary to undertake further sensitivity analysis.

2.5.8 It should be highlighted that as part of the model review process an inconsistency was noted with regards to the representation of the River Derwent outfall to the River Ouse at the Barmby Barrage. Within the hydraulic model there are two sluice openings at this location each with a tidal flap. One of the sluices (BARMBY2) has an invert level of -1.94m AOD which matches the invert level of the tidal flap. The other sluice (BARMBY1) has an invert level of -1.78m AOD, however the invert level of the tidal flap is 1.78m AOD. This was an inherited setup within the received model and it is not clear from the received modelling report as to why the invert levels of the sluice and tidal flap at BARMBY1 are different. It is possible that this is an error and they should in fact be consistent. To understand the impact associated with this potential inconsistency, a sensitivity run was undertaken where the invert level of the flap was amended to match the invert level of the sluice at BARMBY1 (-1.78m AOD). This was simulated for the 1% AEP plus 54% climate change event. Results have shown that there is a significant difference in modelled flood depth and extent to the south of the railway and along the extent of the River Derwent compared to previous results. However, there is less impact at the locations where solar panels are proposed. There is a slight change in flood extent and depth at Solar PV Area 2a, however these do not impact the overall mitigation measures proposed within the FRA or the overall conclusions of the ES.

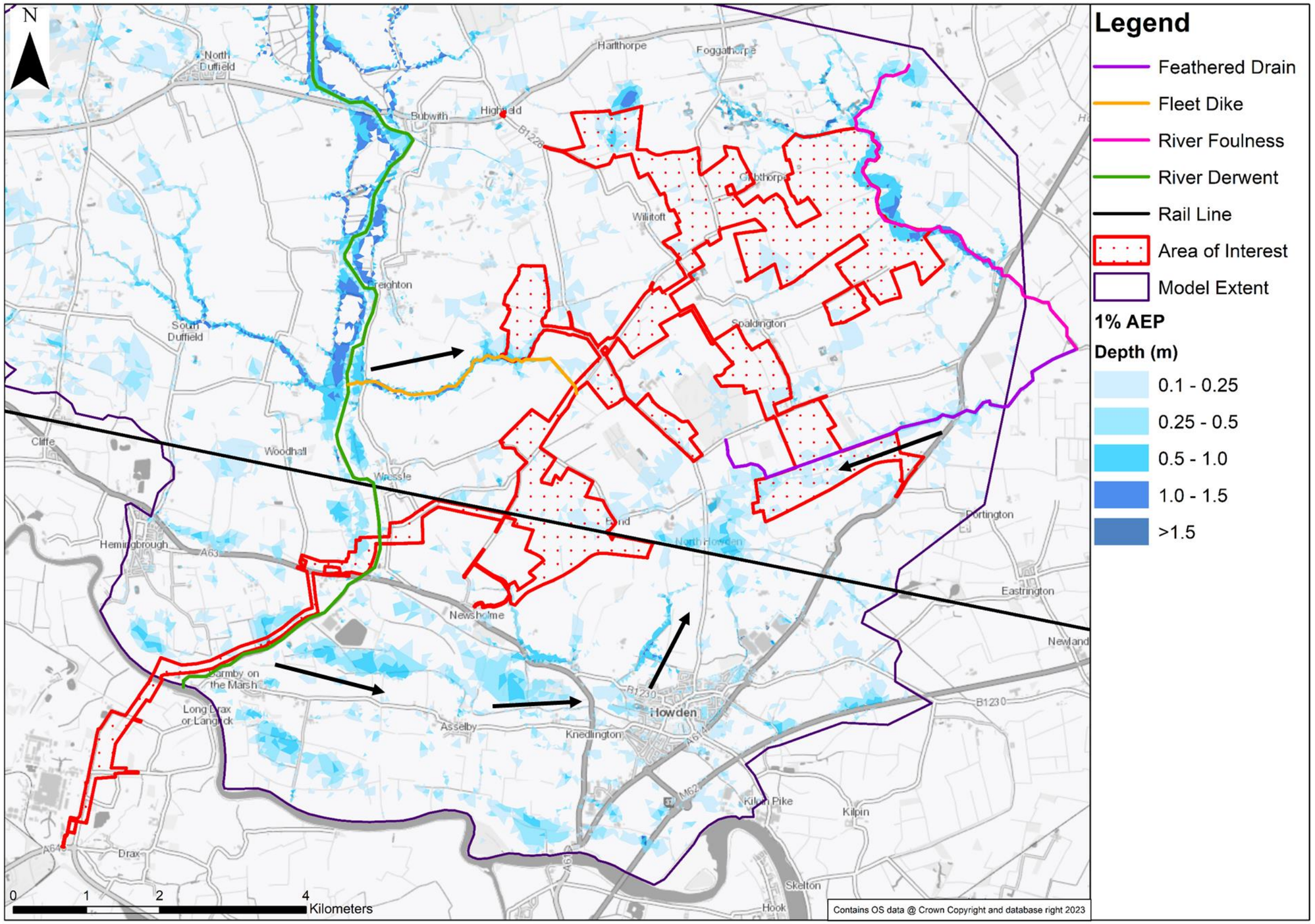

Figure 1. 1% AEP Maximum Flood Extent and Depth (Arrows Represent Direction of Flow)

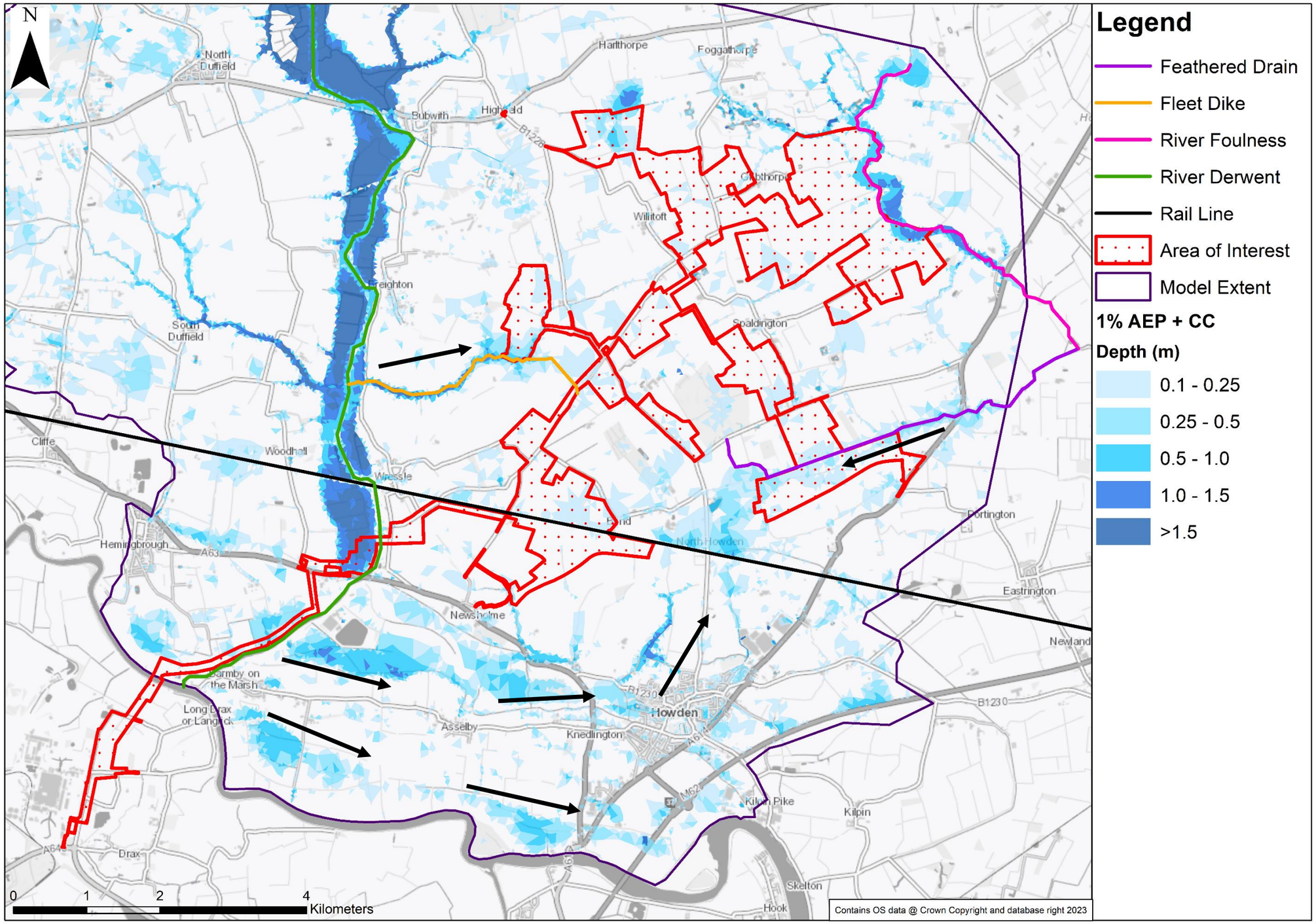

Figure 2. 1% AEP + Climate Change Scenario Maximum Flood Extent and Depth (Arrows Represent Direction of Flow)

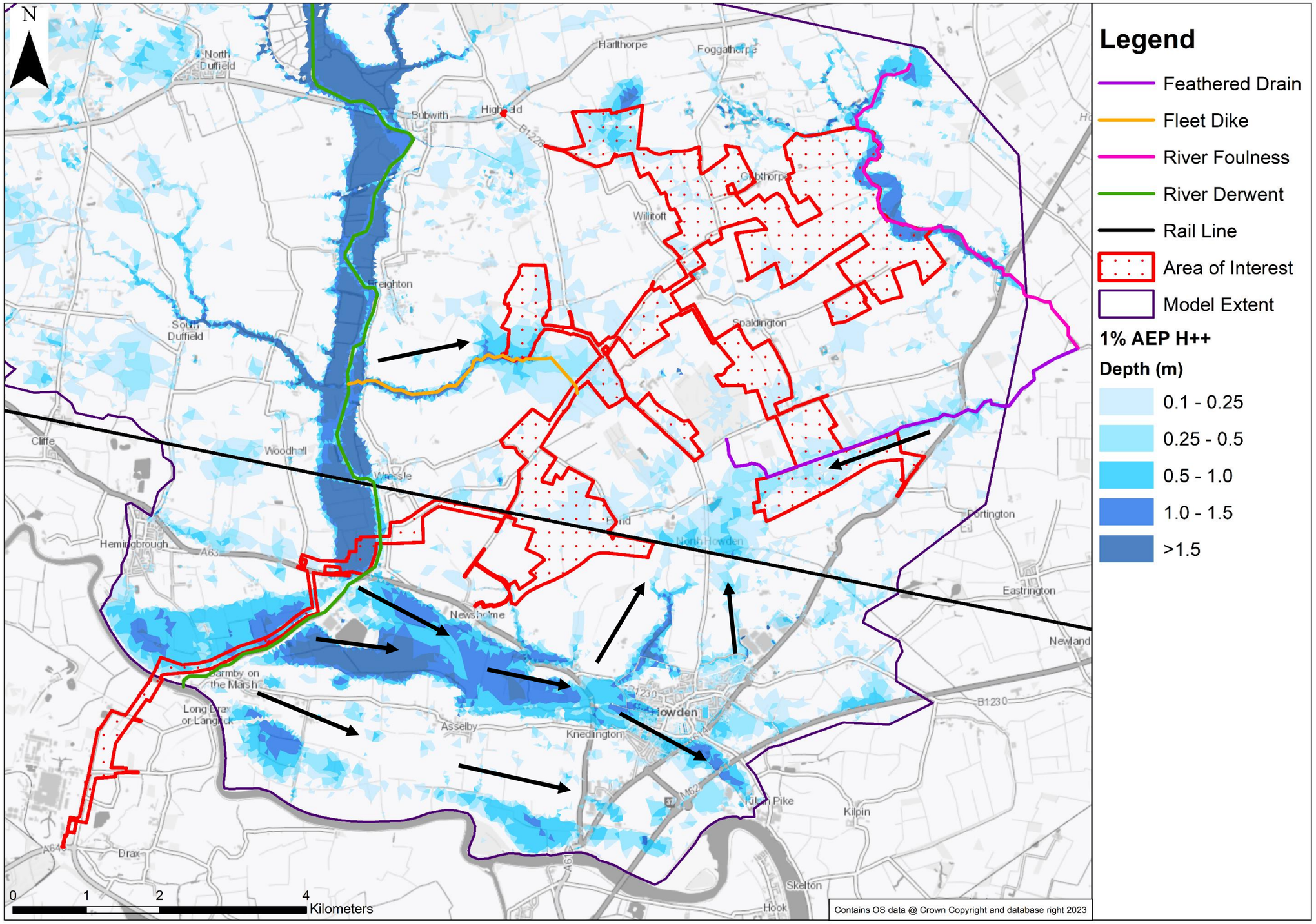

Figure 3. 1% AEP + CC H++ Credible Maximum Scenario Maximum Flood Extent and Depth (Arrows Represent Direction of Flow)

2.6 Conclusion

2.6.1 In conclusion, updates to the existing model have been undertaken to improve stability and representation of the watercourses within the model. Updates have also been applied to the model inflows and boundary conditions in line with current guidance to represent two different climate change scenarios.

2.6.2 The results of this modelling demonstrate that the Scheme is not at significant risk of flooding. Much of the area within the Site is outside of the predicted flood extents in the climate change scenarios. There are some areas of the Site where flooding from the River Derwent is predicted in present day and climate change scenarios but the proposals for this part of the Site are for underground cabling only and therefore this is not considered a significant flood risk. There are other, small, parts of the Site that model results show to be at risk of flooding from smaller watercourses or surface water ponding, where other infrastructure is proposed. The proposed solar panels are to be positioned with at least 300mm freeboard above the climate change flood levels. It should also be noted that other proposed infrastructure that is not solar panels such as substations and field stations are not proposed to be located in areas at a high risk of flooding on the current plans. With no topographic modifications taking place, there will be no impact on flood risk from this development. The overall risk of flooding to the Site from the modelled flood extents, is not considered significant.

Annex C Sequential Test Report

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Figures

Tables

Executive Summary

ES1 East Yorkshire Solar Farm Limited (the Applicant) has commissioned this Sequential Test Report as part of the Flood Risk Assessment to accompany its application for a Development Consent Order (DCO application) for East Yorkshire Solar Farm (hereafter referred to as the Scheme).

ES2 The Scheme is proposed to be located within the administrative areas of East Riding of Yorkshire Council and North Yorkshire Council. The Scheme comprises the following elements: the Solar PV Site, Ecology Mitigation Area, Interconnecting Cable Corridor; Grid Connection Corridor, and Site Accesses. The land required for these elements is collectively referred to as the "Site".

ES3 The National Policy Statements (NPS) for Energy that are in force at the time of submission or acceptance of the DCO application are of relevance. Overarching NPS for Energy EN-1 (NPS EN-1) and draft NPS EN-1 require that flood risk is taken into account when selecting a site by applying the Sequential Test which aims to direct development to areas at lowest risk of flooding.

ES4 The purpose of this Sequential Test Report is to explain how the Sequential Test has been met by the Applicant. The Solar PV Site is the focus of this Sequential Test Report, with other elements of the Site having no reasonable alternative locations for consideration, as identified through the Applicant's site selection process.

ES5 The Solar PV Site covers an area of approximately 966 ha and comprises 16 Solar PV Areas, as shown in **Figure 5-1** in this report.

ES6 The majority of the Solar PV Site is located within Flood Zone 1 (lowest risk of fluvial flooding). However, the Solar PV Site also includes Solar PV Areas wholly within Flood Zone 2 (medium risk of fluvial flooding) and limited areas of Flood Zone 3 (high risk). There are small areas of ground water flooding susceptibility and surface water flooding risk also within the Solar PV Site. Given the risk of flooding within the Solar PV Site, the Sequential Test is required to be demonstrated.

ES7 There is no standard methodology for the consideration of reasonable alternative sites for solar development and therefore the approach has been informed by national planning policy and guidance and the Applicant's approach to site selection. The approach has been split into five stages.

ES8 At Stage 1, an initial area of search was established for 15 km from the point of connection at the National Grid Drax Substation. This was then refined at Stage 2 based on environmental and land use constraints and consideration of other criteria which would identify suitable land for solar development. Within this refined area of search, Stage 2 identified areas of land which are at the lowest risk of flooding (Fluvial and Surface water) or not susceptible to ground water flooding and outside areas of environmental and land use constraints identified during Stage 2.

ES9 A total of 15 land areas at lowest risk of all sources of flooding were identified in Stage 4 and were then assessed in Stage 5. The assessment at

Stage 5 considered how the land meets operational requirements; whether there are any land use conflicts; and the availability and assembly of the land. Of the 15 land areas within the identified unconstrained land assessed, parts of six land areas were considered available and suitable for the Solar PV Site. One of these land areas was also partly available for ecological mitigation. This available land at low risk of flooding is included as part of the Scheme's Solar PV Site and Ecology Mitigation Area. Given the Applicant's land requirements to deliver the Scheme and the availability and suitability of land areas at lowest risk of flooding it has therefore been necessary to use land at a higher risk of flooding.

ES10 In summary, a sequential approach has been applied in selecting the land for the Scheme. The Scheme has been located, as far as possible, in areas with the lowest risk of flooding from any source, therefore demonstrating the Sequential Test for site selection has been met in accordance with NPS EN-1 and draft NPS EN-1.

1. Introduction

1.1 Background

1.1.1 East Yorkshire Solar Farm Limited (the Applicant) has commissioned this Sequential Test Report as part of the Flood Risk Assessment in support of its application for a Development Consent Order (DCO application) for East Yorkshire Solar Farm (hereafter referred to as the Scheme).

1.1.2 The Scheme is proposed to be located within the administrative areas of East Riding of Yorkshire Council and North Yorkshire Council. The Scheme will comprise the construction, operation (including maintenance), and decommissioning of a solar photovoltaic (PV) electricity generating facility, with a capacity exceeding 50 megawatts (MW) and export connection to the national grid, at National Grid Drax Substation.

1.1.3 The Scheme is to be located on land shown on **Figure 1-2, Environmental Statement (ES) Volume 3 [EN/010143/APP/6.3]** and comprises the following elements: the Solar PV Site, Ecology Mitigation Area, Interconnecting Cable Corridor; Grid Connection Corridor, and Site Accesses. The land required for these elements is collectively referred to as the “Site” and is approximately 1,276.5 ha in total.

1.1.4 The Solar PV Site is an area of 966.4 ha and comprises 16 Solar PV Areas. Individual Solar PV Areas have been assigned an identification number as shown in **Figure 5-1**.

1.1.5 Due to its proposed generating capacity being more than 50 MW, the Scheme is classified as a Nationally Significant Infrastructure Project (NSIP) and will therefore require a DCO under the Planning Act 2008 (PA 2008) (Ref. 1). The decision whether to grant a DCO will be made by the Secretary of State for Energy Security and Net Zero (hereafter referred to as the ‘Secretary of State’) following the Examination and Recommendation by an Examining Authority appointed by the Planning Inspectorate.

1.1.6 Of relevance to the determination of the DCO application will be the National Policy Statements (NPS) for Energy that are in force at the time of submission or acceptance of the DCO application. Overarching NPS for Energy EN-1 (NPS EN-1) (Ref. 2) and draft NPS EN-1 (Ref. 3) requires that flood risk is taken into account when selecting a site by applying the Sequential Test which aims to direct development to areas at lowest risk of flooding.

Solar PV Site

1.1.7 The flood risk context for the Solar PV Site is shown in **Figure 9-4, ES Volume 3, [EN010143/APP/6.3]**. The majority of the Solar PV Site is located within Flood Zone 1 (lowest risk of fluvial flooding). However, the Scheme also proposes Solar PV Areas which are entirely within Flood Zone 2 (medium risk of fluvial flooding). Limited areas of Flood Zone 3 (high risk) are also present within Solar PV Area 2a and Solar PV Area 1e. There are small areas of ground water flooding susceptibility and surface water flooding risk also within the Solar PV Site. Given this flood risk context, policies set out in NPS EN-1 (Ref. 2) and other relevant policy documents require the Sequential Test to be demonstrated for the Solar PV Site.

Interconnecting Cable Corridors, Grid Connection Corridor, Site Accesses and Ecology Mitigation Area

1.1.8 Areas of the Grid Connection Corridor, Interconnecting Cable Corridors; Ecology Mitigation Area and Site Accesses are also located within areas at medium (Flood Zone 2) and high (Flood Zone 3) risk of flooding as shown on **Figure 9-4, ES Volume 3, [EN010143/APP/6.3].**

1.1.9 The Interconnecting Cable Corridors will accommodate the cabling required to transfer electricity between the transformers/switchgears at the Field Stations and one of the two Grid Connection Substations in Solar PV Area 1c. The selection of these corridors has considered the technical requirement for the cable routing to be a direct route between the Solar PV Areas and the Grid Connection Substations to avoid losses in transmission. Alternative corridors which would avoid Flood Zones 2 and 3 would not provide a direct route between the Solar PV Areas themselves and between the Solar PV Areas and the Grid Connection Substations. For Solar PV Area 2a an alternative route avoiding Flood Zone 2 would require a route to the north and then east travelling to the south of Willitoft. This would require several road and PRoW crossings and would not have the potential benefit of co-locating Interconnecting Cables and Grid Connection Cables in the same trench along the Grid Connection Corridor which the proposed Interconnecting Cable Corridor links into. For the Interconnecting Cable Corridor between Solar PV Area 2c and Solar PV Area 2d an alternative route avoiding Flood Zone 2 would require crossing a PRoW and either Spaldington Golf Course or the anaerobic digestion plant and wind turbine development to the east. These alternatives were not therefore considered by the Applicant further. There are therefore no reasonable alternatives in areas at lower risk of flooding for the Interconnecting Cable Corridors.

1.1.10 An Ecology Mitigation Area is proposed north-east of the Solar PV Site as shown in **Figure 9-4, ES Volume 3, [EN010143/APP/6.3].** This is to be managed to provide good quality habitat for overwintering and migratory bird species. This land was selected as it is adjacent to the Solar PV Site and is considered suitable to provide mitigation for the loss of land (which is being used for solar PV infrastructure) which is currently functionally linked to the international designated sites of the Lower Derwent Valley Special Protection Area/Ramsar and Humber Estuary Special Protection Area/Ramsar. Parts of the Ecology Mitigation Area lie within Flood Zone 3 however this proposed use is a water compatible use (see section 1.2 of the Flood Risk Assessment, Appendix 9-3, ES Volume 2 [EN010143/APP/6.1]) and therefore is an appropriate use in any Flood Zone.

1.1.11 Construction and operational accesses, such as new access routes or measures to provide better visibility splays are proposed (see **Figure 1-3, ES Volume 3 [EN010143/APP/6.3]**). These were selected following the development of the Applicant's access strategy and in response to consultation feedback. Some areas of this land are within Flood Zone 2 however it is not possible to locate these in areas at a lower risk of flooding due to the need for their location in relation to the public highway. There are therefore no reasonable alternatives in areas at lower risk of flooding for the Site Accesses.

1.1.12 The majority of the Grid Connection Corridor (see **Figure 2-4, ES Volume 3 [EN010143/APP/6.3]**) is located within Flood Zones 2 (medium risk) and 3 (high risk) of fluvial flooding. The point of connection (POC) identified and provided to the Applicant by National Grid at Drax and the surrounding area is predominantly in land with a similar risk of flooding. Through analysis of operational and engineering requirements; planning and environmental constraints; and other land use and land ownership constraints (see **ES Chapter 3 Alternatives and Design Evolution**, **ES Volume 1 [EN010143/APP/6.1]**) the Applicant determined it was not therefore possible to achieve an alternative route at lower risk of flooding. There are therefore no reasonable alternatives in areas at lower risk of flooding for the Grid Connection Corridor.

1.2 Purpose of this report

1.2.1 The purpose of this Sequential Test Report is to explain how the Sequential Test has been met by the Applicant in selecting the land for the Scheme. As discussed above, this is focussed on demonstrating that there are no land areas at lower risk of flooding which would be appropriate and reasonably available for inclusion in the Solar PV Site. Demonstration of how the Scheme meets the Sequential Test within the Solar PV Site as part of its design and layout is provided in section 8 of the FRA, Appendix 9-3, ES Volume 2 [EN010143/APP/6.1].

1.2.2 The Sequential Test Report therefore includes the following sections:

a. Section 2: Policy Context for the Sequential Test - sets out the legislative and planning policy requirements for the application of the Sequential Test and consideration of alternatives.

b. Section 3: Sequential Test Methodology - details the methodology used in the application of the Sequential Test for the Solar PV Site.

c. Section 4: Assessment - sets out the assessment of alternative land areas identified at lower risk of flooding for the Solar PV Site.

d. Section 5: Conclusion – provides a summary of the findings of the Sequential Test.

2. Policy Context for the Sequential Test

2.1 What is the Sequential Test and when is it needed?

2.1.1 The application of the Sequential Test is set out in paragraph 5.7.13 of NPS EN-1 (Ref. 2), which states *"preference should be given to locating projects in Flood Zone 1."* If land in Flood Zone 1 is not reasonably available, then consideration can be given to Flood Zone 2 and subsequently to Flood Zone 3, the latter subject to also meeting the Exception Test.

2.1.2 Paragraph 5.8.6 of draft NPS EN-1 (Ref. 3) states that the aim of policy is to ensure that flooding from all sources is considered at all stages in the planning process to avoid inappropriate development in areas at risk of flooding and steer development to areas at lowest risk of flooding. In determining the application, the Secretary of State should be satisfied that the Sequential Test has been applied and satisfied as part of site selection and that a sequential approach has been applied at the site level to minimise risk by directing the most vulnerable uses to the areas of lowest flood risk (paragraph 5.8.36). Footnote 115 of NPS EN-1 (Ref. 2) states that "*the applicant should justify with evidence what area of search has been used in examining whether there are reasonably available sites".*

2.1.3 Paragraph 5.7.15 of NPS EN-1 (Ref. 2) and paragraph 5.8.10 of draft NPS EN-1 (Ref. 3) identifies types of alternative sites which would not be usually considered appropriate including those within national landscape, heritage and nature conservation designations such as Areas of Outstanding Natural Beauty, Sites of Special Scientific Interest (SSSI) and designated heritage sites.

2.1.4 Emerging policy set out in draft NPS EN-1 (Ref. 3), explains that the Sequential Test ensures that "*a sequential and risk based approach is followed to steer development to new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account*" (Paragraph 5.8.21). It continues that where it is not possible to use low risk areas, the Sequential Test should go on to compare reasonably available sites with medium risk areas and then, only where there are no reasonably available sites in low and medium risk areas, within high-risk areas. Draft NPS EN-1 (Ref. 3) states that "*the sequential approach should be applied to the layout and design of the project. Vulnerable aspects of the development should be located on parts of the site at lower risk and residual risk of flooding"* (paragraph 5.8.29).

2.1.5 The consideration of alternatives should also be undertaken with reference to Section 4.4 of NPS EN-1 (Ref. 2) and Section 4.2 of the draft NPS EN-1 (Ref. 3).

2.1.6 Draft NPS EN-1 (Ref. 3) footnotes the Planning Practice Guidance (PPG) flood risk section (Ref. 4) (paragraph 023 Reference ID: 7-023-20220825 to Paragraph: 030 Reference ID: 7-030-20220825) to provide guidance as to how the Sequential Test should be applied. The PPG states that the Sequential Test is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to other areas of high risk. It provides that "*even where a flood risk assessment shows the development*

can be made safe throughout its lifetime….the sequential test still needs to be satisfied." (Ref. 4) (Paragraph: 023 Reference ID: 7-023-20220825).

2.1.7 The PPG reiterates that all forms of flood risk (including groundwater flooding, reservoir flooding and surface water flooding) need to be treated consistently with river (fluvial) and tidal flooding in mapping probability and accessing vulnerability, so the Sequential Test is applied across all areas of flood risk.

2.1.8 The East Riding of Yorkshire Supplementary Planning Document (SPD) on Flood Risk Sequential and Exception Test (2021) (Ref. 5) also reiterates the approach to the Sequential Test as set out in the NPS EN-1 (Ref. 2) and Draft NPS EN-1 (Ref. 3). It restates the guidance set out in the PPG and in paragraph 3.5 states that:

"*if a Sequential Test is applicable to the development proposal, applicants are required to assemble the relevant information within their planning application to enable the Council to assess whether the Sequential Test has been satisfactorily undertaken. The Council will need evidence of:*

i. The area of search that has been used to assess alternative sites:

ii. The alternative sites identified within the area of search; and

iii. Assessment and explanation of whether alternative sites are at a lower flood risk and are reasonably available." (Ref. 5)

2.2 Consideration of Alternatives

2.2.1 Section 4.4 of NPS EN-1 (Ref. 2) and paragraph 4.2.9 of Draft NPS EN-1 (Ref. 3) do not require alternatives to be considered or to establish whether the proposed project represents the best option from a policy perspective. The consideration of alternatives should be undertaken in a proportionate manner and only consider those alternatives which can meet the objectives of the Scheme. It is not required to prove that the "*proposed project represents the best option*" (paragraph 4.4.1 NPS EN-1 (Ref. 2)) compared to alternatives but that alternatives have been considered where relevant which in this case is with regard to flood risk. Further details on the alternatives assessed for the Scheme are set out in **Chapter 3 Alternatives and Design Evolution, ES Volume I [EN010143/APP/6.1].**

2.2.2 Applicants are however obliged to include information on the main alternatives that they have studied within the ES. This should include reasons for the applicant's choice taking into account environmental social and economic effects and where relevant any technical and commercial feasibility (paragraph 4.2.15 of draft NPS EN-1 (Ref. 3)).

2.2.3 NPS EN-1 (Ref. 2) and draft NPS EN-1 (Ref. 3) explain that there may be a specific policy requirement to consider alternatives such as the application of the Sequential Test for Schemes located in areas at risk of flooding as stated in paragraph 4.4.3 of NPS EN-1 (Ref. 2) and 4.2.17 of draft NPS EN-1 (Ref. 3), "*where there is a policy or legal requirement to consider alternatives, the applicant should describe the alternatives considered in compliance with these requirements."*

2.2.4 NPS EN-1 (Ref. 2) paragraph 4.4.3 and draft NPS EN-1 (Ref. 3) paragraphs 4.2.21 to 4.2.27 explain the weight to be given to alternatives in the

Secretary of State's decision which includes but is not limited to the following:

a. Consideration of alternatives to comply with policy requirements should be proportionate.

b. Whether there is a realistic prospect of the alternative delivering the same capacity and at the same timescale.

c. If legislation proposes a target, permission should not be refused on one site simply because fewer adverse effects would result from developing similar infrastructure on another suitable site and it should have regard as appropriate to the possibility that all suitable sites for energy infrastructure of the type proposed may be needed for future proposals.

d. Alternatives that are not among the main alternatives should only be considered if relevant and important to the decision making.

e. Alternatives must be in accordance with relevant NPS policy.

f. Alternative proposals that mean the necessary development could not proceed due to commercial viability or physical suitability can be excluded as not relevant and important to the decision maker.

g. Alternative proposals which are vague or inchoate should be excluded.

3. Sequential Test Methodology

3.1 Staged methodology

3.1.1 As there is no standard methodology for the consideration of reasonably available alternative sites for solar energy developments, the Applicant's approach to the Sequential Test has been informed by the policy and guidance set out in Chapter 2 of this report and its approach to selecting the land for the Solar PV Site.

3.1.2 The following has been undertaken to identify and consider reasonably available land at lower risk of flooding to confirm the Sequential Test can be demonstrated for the selection of land for the Solar PV Site.

a. Stage 1: Defining an initial area of search

   The Applicant identified East Yorkshire and neighbouring parts of North Yorkshire as suitable for solar development due to good levels of irradiance and flat topography with a legacy of power generation in these areas. A POC with 400 MW of capacity was identified at the National Grid Drax Substation. From the POC an initial area of search to identify land for the Solar PV Site was defined based on viable distance from the POC for a large-scale solar farm that would deliver the electricity generating capacity agreed with National Grid.

b. Stage 2: Refining the initial area of search

   The initial area of search was refined by avoiding environmental and land use constraints and taking into consideration other criteria which would identify suitable land for solar development. This identified an area in the north-eastern part of the initial area of search which was fairly unconstrained. This was used for the selection of the Solar PV Site and has therefore been used as the area of search for the Sequential Test.

c. Stage 3: Application of all sources of flood risk and environmental constraints/designations to the refined area of search resulting in the identification of unconstrained land in areas of low flood risk (taking into account all sources – fluvial, surface water and groundwater[1])

d. Stage 4: Establishing land areas within the unconstrained land in areas of low flood risk that could be alternative Solar PV Areas for the Solar PV Site.

e. Stage 5: Assessment of land areas within the unconstrained land taking into consideration how the land meets operational requirements; whether there are any land use conflicts; and land availability and assembly.

[1] With regard to reservoir flooding, there is no extent of flooding on the government mapping if the River levels remain normal within the refined area of search. Whilst the mapping shows some areas of flooding around the River Foulness and around Wressle and North Howden should the river levels also flood, the probability of a reservoir flooding is very low due to the legal responsibility under the Reservoirs Act 1975. Therefore it is considered that with this low risk, reservoir flooding is not a significant determinant for determining site alternatives and has not been considered further

3.1.3 The assessment presented at Stage 5 used information from desk based research such as google mapping, local authority planning portals, and details regarding landowner discussions and land title information provided by the Applicant.

3.1.4 The assessment of potential alternative Solar PV Areas is therefore considered to be high level, using data from readily available sources. No site visits have been undertaken to further validate this information. This approach is compliant with NPS EN-1 4.4.3 (Ref. 2) which states "*the consideration of alternatives in order to comply with policy requirements should be carried out in a proportionate manner".*

3.1.5 To understand the position with regard to ground water flooding, data was obtained from the British Geology Society (Ref. 6) that identifies the susceptibility of the area to groundwater flooding. However, the data does not identify risk. All areas identified in the data with a susceptibility for groundwater flooding were therefore removed from the unconstrained areas.

3.2 Brownfield Land

3.2.1 Paragraph 5.10.3 of NPS EN-1 (Ref. 2) states that the re-use of previously developed land for new development can make a major contribution to sustainable development by reducing the amount of countryside and undeveloped greenfield land that needs to be used. Section 3.10 of draft NPS EN-3 (Ref. 7) recognises that agricultural land will need be used for large scale solar schemes, but that preference should be given to using brownfield land and non-agricultural land. Paragraph 119 of the NPPF (Ref. 8), and Planning Practice Guidance (Ref. 9) also expects planning decisions and policies to promote the effective use of land.

3.2.2 The brownfield register for each of the local planning authorities (Ref. 10 and Ref. 11) has been reviewed and all sites within the initial search area have been considered. The brownfield land review has not identified any brownfield land of the size required by the Scheme. A site in Breighton is listed on the brownfield register for East Riding of Yorkshire Council (Ref. 10) and covers an area of 1.28 ha. It is a disused campsite however planning permission was granted in 2017 (16/03603/PLF) for the erection of six dwellings with associated garages, access, and landscaping on this land. This planning permission has been implemented and therefore this land is not available to form part of the Solar PV Site.

4. Assessment

4.1 Stage 1: Determining an initial area of search

4.1.1 Proximity to an available grid connection with appropriate capacity is fundamental to the viability and deliverability of large-scale solar development. The Applicant was aware of the legacy of coal fired power stations in the East Yorkshire and North Yorkshire areas and undertook a search of available capacity within these areas. Following discussions with National Grid, the Applicant secured a POC to the national electricity transmission system at the existing National Grid Drax Substation, in Drax, North Yorkshire.

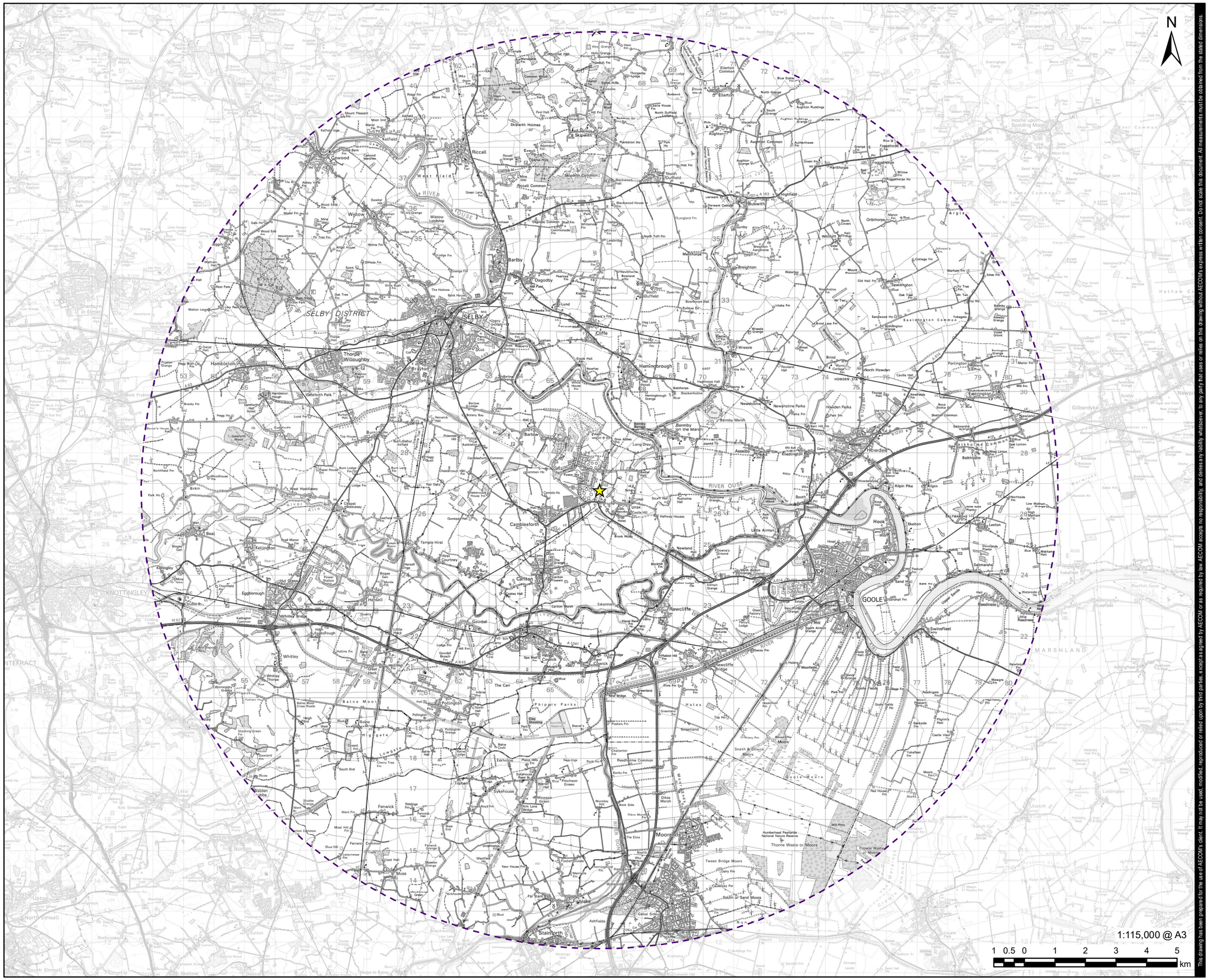
4.1.2 Draft NPS EN-3 (Ref. 7) at paragraph 3.10.35 states that "*The capacity of the local grid network to accept the likely output from a proposed solar farm is critical to the technical and commercial feasibility of a development proposal*". Paragraph 3.10.37 of draft NPS EN-3 (Ref. 7) continues to highlight the importance of the connection voltage, availability of network capacity, and the distance of a solar farm to the network as having a significant effect on the commercial feasibility of solar development.

4.1.3 Irradiation (sunlight) levels and topography are key factors when determining the location of solar development affecting their efficiency. Draft NPS EN-3 (Ref. 7) paragraph 3.10.10 states that "*Irradiance will be a key consideration for the applicant in identifying a potential site as the amount of electricity generated on site is directly affected by irradiance levels*". Flat topography is also preferred as this limits the shading between arrays and allows for the panels to be optimally configured for best production levels. Flat land is easier to screen compared to sloped areas which may be more visually intrusive and makes construction easier. Open fields of a regular shape are preferred to avoid vegetation removal during construction. A land assembly of larger fields also means offsets from field edges, to protect vegetated boundaries, as well shading, can be reduced.

4.1.4 East Yorkshire and neighbouring areas of North Yorkshire have good levels of irradiance and topography which is primarily large flat open land suitable to support large ground mounted solar development.

4.1.5 NPS EN-1 (2011) (Ref. 2) paragraph 4.4.3 states that when considering alternative proposals, they should be commercially viable and physically suitable. With increased distance from the POC, the transmission of electricity to the grid becomes less efficient and the connection becomes considerably more costly and can affect the viability of a solar development. The Applicant therefore identified that 15km would be the maximum viable distance for the connection for the Scheme. This initial area of search is within the administrative areas of East Riding of Yorkshire Council and North Yorkshire Council.

4.1.6 **Figure 4-1: Initial area of search - 15km radius from point of connection** shows this initial area of search from the POC at the National Grid Drax Substation.



AECOM

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LEGEND

- Point of Connection at National Grid Drax Substation
- Initial Area of Search

NOTES

ISSUE PURPOSE

Sequential Test Report

PROJECT NUMBER

60683115

FIGURE TITLE

Initial Area of Search – 15km Radius from Point of Connection

FIGURE NUMBER

Figure 4-1

Filename: I:\50004 - Information Systems\60683115_Boom Power\02_Maps\Environmental Statement\App9-3_Flood_Rek_Assessment\App_9-3_Annex_Alternatives Sequential Assessment\PLA_AA_Fig4-1_AreaofSearch_A3_20231114_R0.mxd Revision: 0 Drawn: LL Checked: AK Approved: CH Date: 2023-11-14

4.2 Stage 2: Refining the initial Area of Search

4.2.1 The initial area of search was refined given its size. This was achieved through the avoidance of environmental and land use designations and constraints and taking into consideration other criteria which would identify suitable land for solar development.

4.2.2 **Table 1** explains the constraints and other criteria used to refine the initial area of search.

Table 1 Environmental and land use designations and constraints and other criteria

Constraint/ consideration	Justification
Internationally and nationally designated biodiversity sites	NPS EN-1 (section 5.3) (Ref. 2) and Draft NPS EN-1 (section 5.4) (Ref. 3) explain that the most important sites for biodiversity are those which are identified in international conventions and European directives. These designated sites are therefore given the highest protection in planning policy and where possible development should ensure the conservation and enhancement of them. Special Areas of Conservation (SAC), Ramsar Sites, Sites of Specific Scientific Interest (SSSI) and National Nature Reserves (NNR) were therefore avoided.
National landscape designations	Paragraph 5.9.9 of NPS EN-1 (Ref. 2) states that *"National Parks, the Broads and AONBs have been confirmed by the Government as having the highest status of protection in relation to landscape and scenic beauty"*. It continues that "*the conservation of the beauty of the landscape and countryside should be given substantial weight*" in determining applications for development consent in these areas. Consent for development in these areas should therefore only be given in exceptional circumstances as set out in 5.9.10 of NPS EN-1 (Ref. 2). Developments outside these designated areas but on their boundary may also impact them. Paragraph 5.9.12 NPS EN-1 (Ref. 2), and Draft NPS EN-1 (Ref. 3) state that: *"The aim should be to avoid harming the purposes of designation or to minimise adverse impacts on designated areas, and such projects should be designed sensitively given the various siting, operational, and other relevant constraints."* It was identified that no Areas of Outstanding Natural Beauty or National Parks are present within the initial area of search.
Green belt	The purpose of the Green belt is to prevent urban sprawl by keeping land permanently open. As set out in NPS EN-

Constraint/ consideration	Justification
	1 (Ref. 2), draft NPS EN-1 (Ref. 3) and the NPPF section 13 (Ref. 8), there is a general presumption against inappropriate development that would affect the openness of the Green belt and inappropriate development is not permitted unless there are very special circumstances. Green belt within the initial Area of Search was identified and therefore avoided.
Designated Heritage Assets	Section 5.8 of NPS EN-1 (Ref. 2) considers heritage assets and details the various classifications of heritage assets. Some heritage assets have significance that justifies designation. As set out in paragraph 5.8.14 of NPS EN-1 (Ref. 2) *"there should be a presumption in favour of the conservation of designated assets and the more significant the designated heritage asset the greater presumption in favour of its conservation should be"*. Harm can be caused to the significance of an asset not just through its loss, but also through harm to its setting. Scheduled monuments and Conservation Areas were identified and avoided. Other designated heritage assets such as Registered Parks and Gardens, World Heritage Sites, and Registered Battlefields were not identified in the initial area of search.
Proximity to dwellings/urban areas	Draft NPS EN-3 (Ref. 7) expects solar PV infrastructure to minimise the potential for adverse impacts on visual amenity and from glint and glare upon residential properties. Large urban areas within the initial area of search were therefore avoided.
Forest/ Woodland – national inventory, ancient woodland	Ancient woodland and veteran trees are identified as valuable biodiversity resources. Areas of woodland also provide a habitat resource for biodiversity and should therefore be retained where possible. In relation to ancient woodland NPS EN-1 paragraph 5.3.14 (Ref. 2) provides that consent should not be granted "*for any development that would result in its loss or deterioration unless the benefits of development outweigh the loss of woodland habitat*". Large areas of woodland, including ancient woodland, identified on the national inventory were therefore avoided.
Flood Risk (Fluvial Flooding)	Flooding was also considered at this stage taking into account fluvial flood risk. Those areas which were highest risk of flooding (Flood Zones 2 and 3) were mapped to

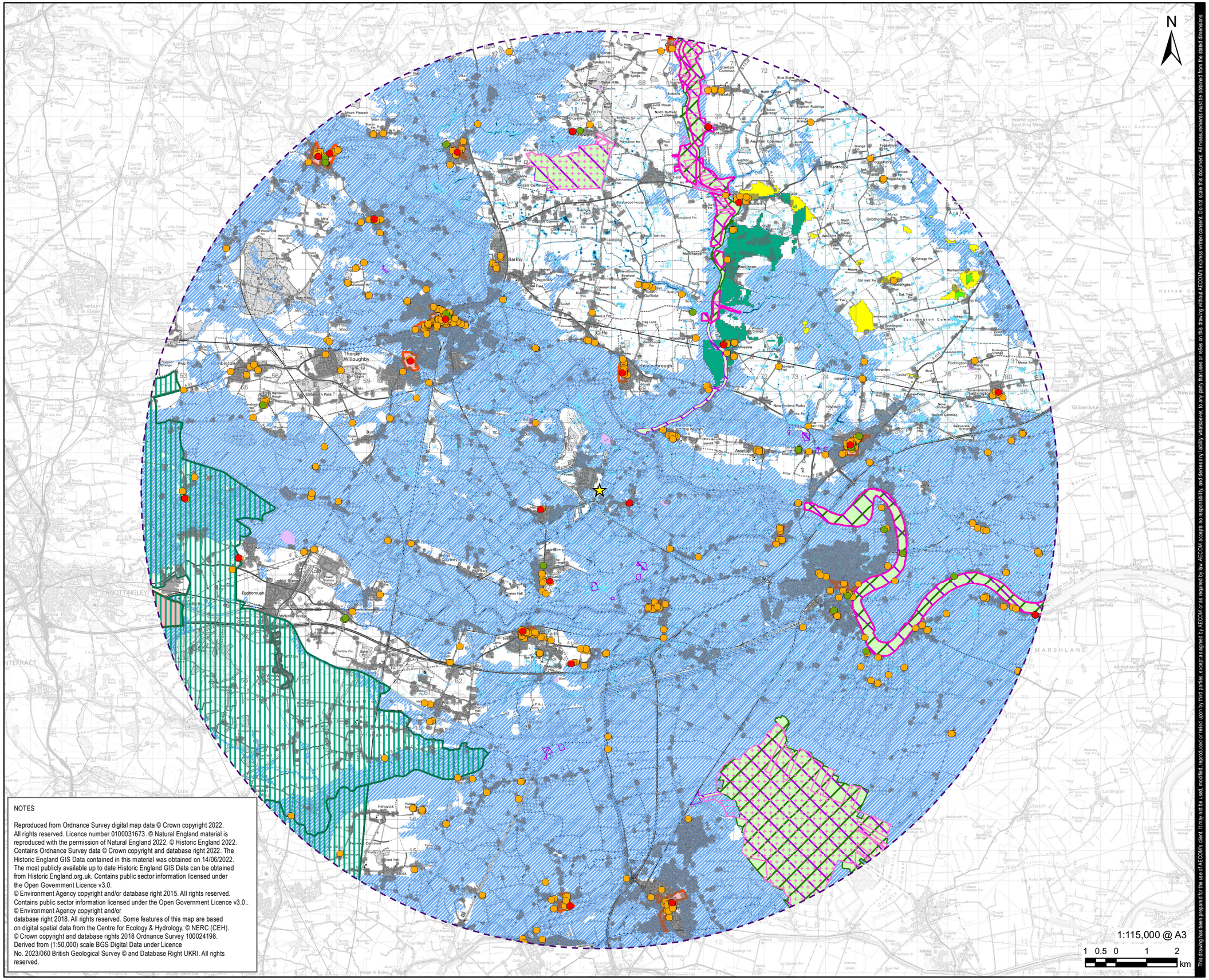
Constraint/ consideration	Justification
	inform the refinement of the area of search. Whilst Annex 3 of the NPPF (Ref. 12) states that solar farms are classified as Essential infrastructure and would be considered less sensitive to flood risk, large areas of Flood Zone 3 were avoided to reduce the risk of infrastructure such as Grid Connection Substations and Field Stations, which are more flood sensitive than the solar PV arrays, being in areas at the highest risk of flooding.
Best and most versatile agricultural land	Paragraph 5.10.8 of NPS EN-1 (Ref. 2) states that *"applicants should seek to minimise impacts on best and most versatile agricultural land (defined as grades 1, 2, and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5) except where this would be inconsistent with other sustainability considerations*". It continues at paragraph 5.15.15 (Ref. 2) with "*applicants should not site their scheme on best and most versatile agricultural land without justification*". Draft NPS EN-3 at paragraph 3.10.14 (Ref. 7) expects that when siting solar PV projects these should utilise, where possible, previously developed land, and where agricultural land is proposed, poorer quality land should be preferred, preferably of classification 3b, 4 and 5 (avoiding the use of best and most versatile cropland where possible). The draft NPS EN-3 (Ref. 7) does however acknowledge that the development of ground mounted solar arrays is not prohibited on agricultural land that is best and most versatile (BMV). Defra's provisional Agricultural Land Classification (ALC) mapping (Ref. 13) was used by the Applicant to avoid large areas of BMV and identify large areas of relatively unconstrained non-BMV land within the initial area of search. This is the only current and detailed published ALC data covering the whole of the initial area of search. Due to the way that this national level data is presented, grade 3a and grade 3b agricultural land cannot be distinguished.
Accessibility	Paragraph 3.10.21 of draft NPS EN-3 (Ref. 7) states that "*Given that potential solar farm sites are largely in rural areas, access for the delivery of solar arrays and associated infrastructure during construction can be a significant consideration for solar farm siting*". Therefore, identifying suitable access for heavy goods vehicles (HGVs) and abnormal indivisible loads (AIL) is an important consideration as large equipment and construction personnel will need to access the Solar PV Areas. The Applicant considered the potential for HGV

Constraint/ consideration	Justification
	access preferring an area with good access to the strategic and local road network. The refined area of search is bounded by the A614 to the east and the A613 to the north with access to the M62 to the south.

4.2.3 **Figure 4-2: Planning and environmental constraints within the initial area of search and refined area of search** illustrates the agricultural land classification of the initial area of search. The two ALC Grade 5 areas shaded brown are National Nature Reserves and are not suitable for solar development. Areas identified in orange as non-agricultural are not available as land use conflicts have been identified which include woodland, an ash disposal site and Drax Power Station. In addition, none of these would be large enough to meet Scheme's requirements.

4.2.4 **Figure 4-3**: **Agricultural Land Classification within the initial area of search** shows a significant proportion of Defra's provisional Grade 4 agricultural land in the north eastern and southern parts of the initial area of search. The latter, as per the constraints mapping shown in **Figure 4-2: Planning and environmental constraints within the initial area of search and refined area of search** and **Figure 4-4: Agricultural Land Classification and Flood Risk ,** is largely covered by Flood Zone 3 and parts are also within the Green belt.

4.2.5 Taking this and other environmental constraints as well as considerations relating to accessibility, the north eastern part of the initial area of search was identified as a suitable and proportionate refined area of search for the Solar PV Site. Linear features including the road network, the railway line to the south, the River Foulness to the east, and the River Derwent to the west were used to define the refined area of search. The refined area of search is shown in **Figure 4-4: Agricultural Land Classification and Flood Risk**



NOTES

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1:115,000 @ A3

1 0.5 0 1 2 km

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LEGEND

- Point of Connection at National Grid Drax Substation
- Initial Area of Search

Biodiversity Designations
- Ramsar
- National Nature Reserve (NNR)
- Special Protection Area (SPA)
- Site of Special Scientific Interest (SSSI)
- Special Area of Conservation (SAC)
- Green Belt
- Buildings (VML(1:25K))

Heritage Designations
- Conservation Area
- Scheduled Monument
- Listed Building - Grade I
- Listed Building - Grade II*
- Listed Building - Grade II

Flood Risk (Fluvial)
- Flood Zone 2
- Flood Zone 3

Surface Flood Risk
- 0.1% Annual Exceedance Probability
- 1% Annual Exceedance Probability
- 3.33% Annual Exceedance Probability

Groundwater Flooding
- Limited potential for groundwater flooding to occur
- Potential for groundwater flooding of property situated below ground level
- Potential for groundwater flooding to occur at surface

ISSUE PURPOSE
Sequential Test Report

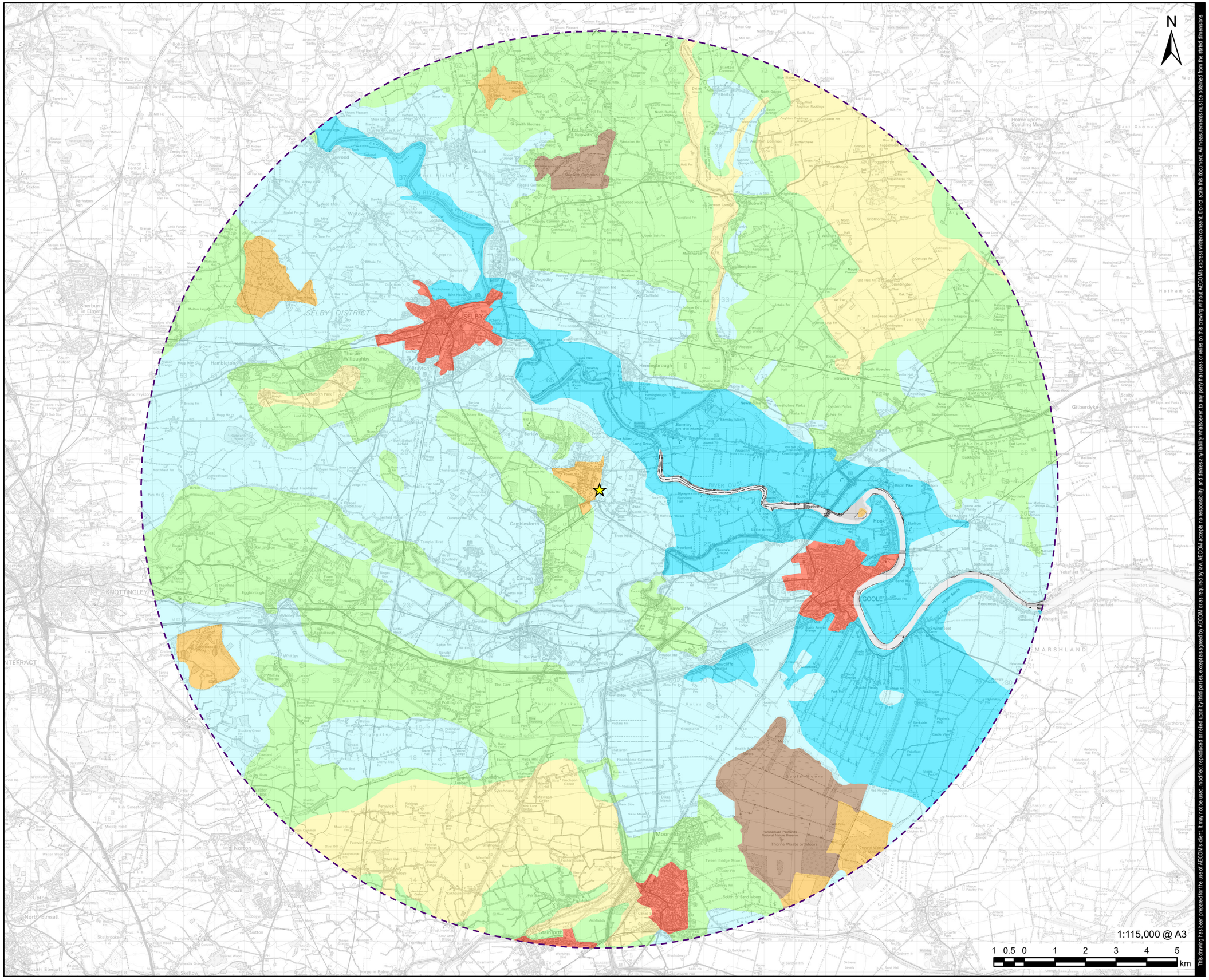
PROJECT NUMBER
60683115

FIGURE TITLE
Planning and Environmental Constrains within Initial Area of Search

FIGURE NUMBER
Figure 4-2

Filename: I:\5004 - Information Systems\60683115_Boom Power\02_Maps\Environmental Statement\App9-3_Flood_Rsk_Assessment\App_9-3_Annex_Alternatives Sequential Assessment\PLA_AA_Fig4-3_AgriculturalLandClassification_A3_20231114_R0.mxd

Revision: 0 Drawn: LL Checked: AK Approved: CH Date: 2023-11-14



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LEGEND

- Point of Connection at National Grid Drax Substation
- Initial Area of Search

Agricultural Land Classification (Provisional)

- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Non Agricultural
- Urban

NOTES

ISSUE PURPOSE

Sequential Test Report

PROJECT NUMBER

60683115

FIGURE TITLE

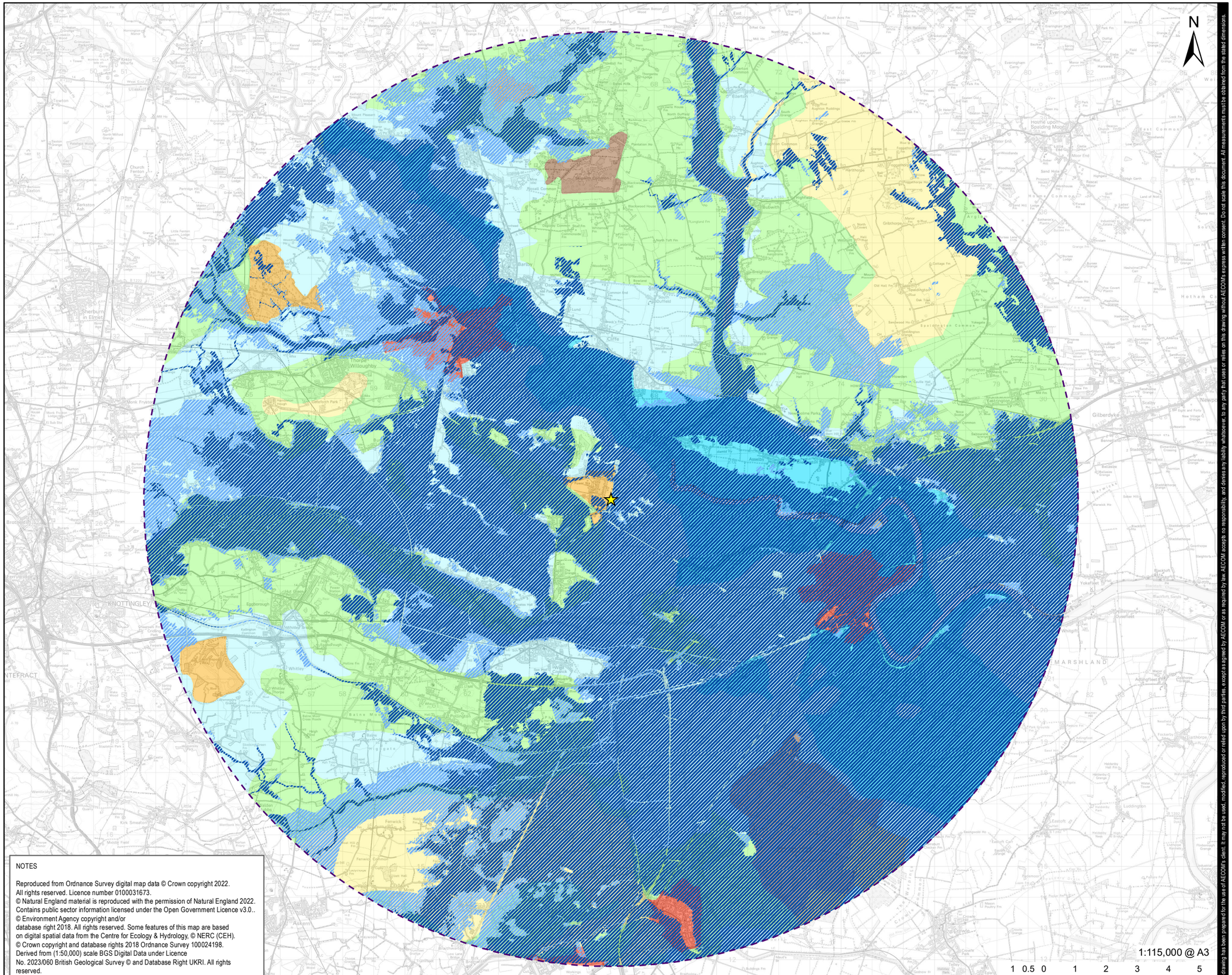
Agricultural Land Classification within Initial Area of Search

FIGURE NUMBER

Figure 4-3

Filename: I:\5004 - Information Systems\60683115_Boom Power\02_Maps\Environmental Statement\App\9-3_Flood_Risk_Assessment\App_9-3_Annex_Alternatives Sequential\Assessment\PLA_AA_Fig4-4_AgriculturalLandClassificationFloodRisk_A3_20231114_R0.mxd

Revision: 0 Drawn: LL Checked: AK Approved: CH Date: 2023-11-14



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LEGEND

ISSUE PURPOSE

Sequential Test Report

PROJECT NUMBER

60683115

FIGURE TITLE

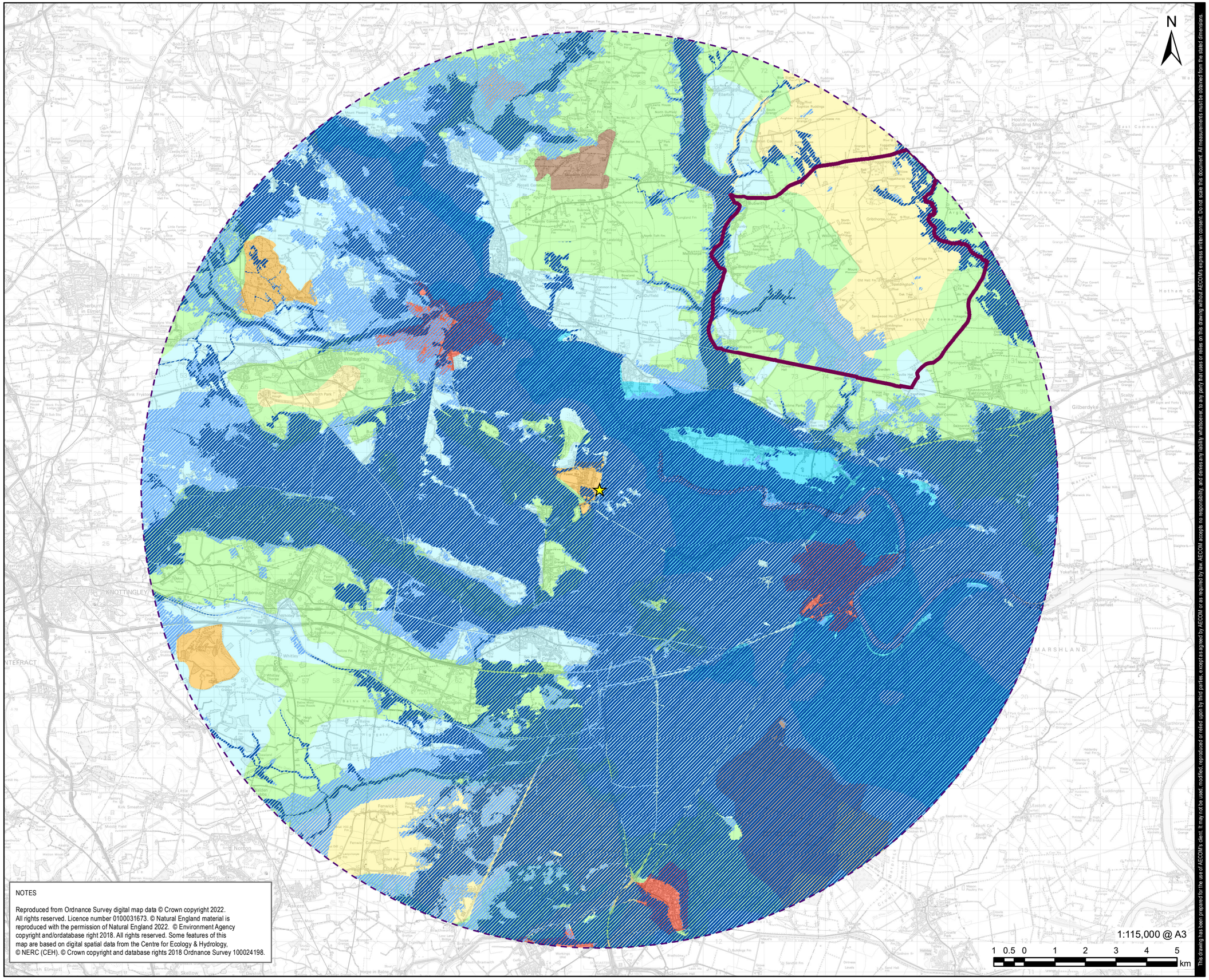
Agricultural Land Classification and Flood Risk

FIGURE NUMBER

Figure 4-4

Filename: I:\5004 - Information Systems\60683115_Boom Power\02_Maps\Environmental Statement\App\9-3_Flood_Risk_Assessment\App_9-3_Annex_Alternatives Sequential\Assessment\PLA_AA_Fig4-5_AgriculturalLandClassificationFloodRisk_AreaofSearch_A3_20231114_R0.mxd

Revision: 0 Drawn: LL Checked: AK Approved: CH Date: 2023-11-14



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ISSUE PURPOSE

Sequential Test Report

PROJECT NUMBER

60683115

FIGURE TITLE

Refined Area of Search

FIGURE NUMBER

Figure 4-5

4.3 Stage 3: Identification of Unconstrained Land

4.3.1 To identify reasonably available alternative areas of land within the refined area of search which are at low risk of flooding from all sources, the following was mapped as constrained land:

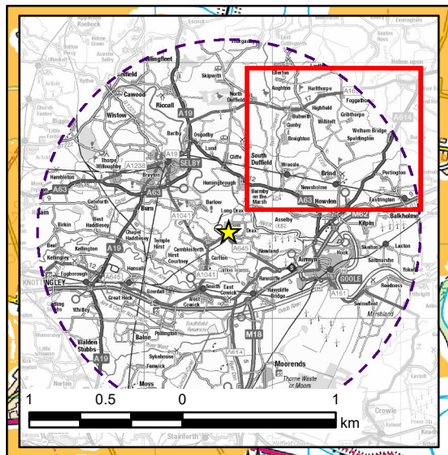
a. Land within Flood Zones 2 and 3.

b. Land at medium and high risk of Surface Water Flooding.

c. Areas suceptable (but not probable) to groundwater flooding.

d. The environmental and land use constraints used to identify the refined area of search.

4.3.2 **Figure 4-6**: **Unconstrained land within the refined area of search** shows the resulting unconstrained land which is at low risk of flooding from all sources, to be considered in the Sequential Test.



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LEGEND

- Refined Area of Search from Point of Connection
- Initial Area of Search
- Unconstrained Land

NOTES

ISSUE PURPOSE

Sequential Test Report

PROJECT NUMBER

60683115

FIGURE TITLE

Unconstrained Land within the Refined Area of Search

FIGURE NUMBER

Figure 4-6

Filename: I:\5004 - Information Systems\60683115_Boom Power\02_Maps\Environmental Statement\App9-3_Flood_Risk_Assessment\App_9-3_Annex_Alternatives Sequential Assessment\PLA_AA_Fig4-6_UnconstrainedLand_A3_20231114_R0.mxd Revision: 0 Drawn: LL Checked: AK Approved: CH Date: 2023-11-14

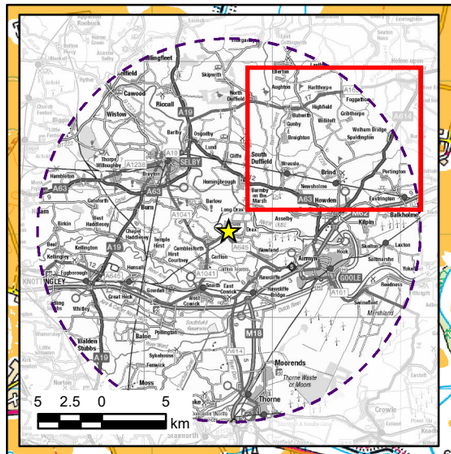
4.4 Stage 4: Establishing Alternative Solar PV Areas

4.4.1 Through its site selection process the Applicant identified Solar PV Areas comprising a land area of approximately 1000 ha which it considered it required for an economically viable energy generating station using the solar PV panel technology proposed (single access tracker technology). This type of solar technology requires space to move and therefore arrays require appropriate spacing to function appropriately and reduce shading. The Applicant has also sought land to provide flexibility for areas of environmental and heritage mitigation should this be required.

4.4.2 Within the unconstrained land identified, areas of land have been identified as shown on **Figure 4-7: Unconstrained land areas for assessment** using title/landholding information where available from searches and using natural and linear features such as hedgerows and field boundaries or roads and watercourses. This figure also illustrates the land that is at a low risk of flooding that has been selected by the Applicant for the Scheme (see pink and green hatching).

4.4.3 At the time the Applicant was selecting the Solar PV Site, additional land was offered immediately in the unconstrained area to the south of the refined area of search by one of the landowners of the Solar PV Areas in the refined area of search. The Applicant considered this land against its selection criteria and this land, now Solar PV Site 3c, was included.

4.4.4 The land areas have then been taken forward to Stage 5: assessment.



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LEGEND

- Refined Area of Search from Point of Connection
- Initial Area of Search
- Indicative Additional Individual Land Parcel Boundary
- Unconstrained Land
- Ecological Mitigation Area within Unconstrained Land
- Solar PV Site within Unconstrained Land

NOTES

ISSUE PURPOSE

Sequential Test Report

PROJECT NUMBER

60683115

FIGURE TITLE

Unconstrained Land Areas for Assessment

FIGURE NUMBER

Figure 4-7

Filename: I:\5004 - Information Systems\60683115_Boom Power\02_Maps\Environmental Statement\App9-3_Flood_Rsk_Assessment\App_9-3_Annex_Alternatives Sequential Assessment\PLA_AA_Fig4-7_UnconstrainedLandAreasForAssessment_A3_20231114_R0.mxd
Revision: 0 Drawn: CB Checked: LL Approved: CH Date: 2023-11-14

4.5 Stage 5: Assessment of land areas

4.5.1 Following the approach taken by the Applicant to select the Solar PV Areas, the areas of land identified at Stage 4 have been evaluated against the following criteria as detailed in **Table 2** below:

a. **Operational considerations** – Is the land area relatively flat, open and of a regular shape? Is the land area likely to be constrained by features which would result in shading? e.g. trees/woodland.

b. **Land use conflicts** – Does the land area have any existing land uses/development allocations/safeguarded areas/extant planning permissions which would potentially conflict with the proposed development? Is the land area covered by any existing planning applications?

c. **Land Availability and Assembly** – Has the land area been offered to the Applicant for development by the landowner? Does the land area have complex land ownership such as a need to agree with multiple parties? Is there any unregistered land within the land area?

4.5.2 The land area reference listed in **Table 2** are illustrated in **Figure 4-7: Unconstrained land areas for assessment**

Table 2. Assessment of unconstrained land areas

Land Area Ref	Size (ha) and location	Operational considerations	Land use constraints	Land availability and assembly	Reasonably available land area?	Relevant Solar PV Site Reference if already included within the Solar PV Site
A	172 ha of land located to the south east of Bubwith, between the B1228, Breighton Aerodrome and Breighton Road.	Online mapping indicates that the land area is relatively flat. The northern part of the land area is made up of smaller fields. From aerial mapping there appears to be large trees along field boundaries. The Bubwith Rail Trail (disused railway) running through this land area is screened by many trees.	This land area is adjacent to residential properties within Bubwith to the west and north. Land is allocated around Bubwith for further residential development and expansion, and a live planning application for the erection of 33 dwellings is still pending, which may result in further residential dwellings in close proximity to this land area to the north west. There is also planning permission for the construction of a BMX/Scooter and cycling proficiency track to the north west of this land area. A disused railway line which is allocated as local open space for leisure and recreation and is also a public right of way (PRoW) and bridleway known as the Bubwith Rail Trail passes within the northern part of the land area. Bubwith Leisure Centre with a playing field and Bubwith Tennis Club are located within this land area. The south eastern part of this land area is used by Breighton Aerodrome as an operational aerodrome.	The Applicant has confirmed with owners of the land that large areas within this land area are not available due to the majority of it being required for farming by the landowner. A large area is also unregistered land.	No. A large proportion of this land area is unavailable due to landowner requirements and also some of the land area is unregistered. Existing land use constraints are also identified and would be displaced by a Solar PV Area at this location.	N/A
B	56 ha of land to the west of Breighton, south of Breighton Aerodrome.	Online mapping indicates that the land area is relatively flat. There are several smaller fields within this land area.	Part of this land area falls within a Minerals Safeguarding Area. It is east of the village of Breighton and therefore close to residential properties within the village.	The Applicant has confirmed that this land area was not offered by the landowner for the Scheme, therefore it is unavailable.	No. This land area was not offered by the landowner and is therefore not available.	N/A

Land Area Ref	Size (ha) and location	Operational considerations	Land use constraints	Land availability and assembly	Reasonably available land area?	Relevant Solar PV Site Reference if already included within the Solar PV Site
		There are areas of woodland surrounding which may have the potential to cause shading.	This land area is an unusual shape which would be inefficient for the arrangement of solar PV arrays. It is also adjacent to Breighton Aerodrome which is an operational airfield. The land area is isolated from other areas within the refined area of search. There is one PRoW within this land area.			
C	276 ha of land to the east of the B1228, south of the A163 and west of Foggathorpe.	Online mapping indicates that the land area is relatively flat. There are a large number of relatively small fields. There is an area of woodland in the middle of this land area which would potentially cause shading, as well as many trees along the boundaries of the large number of smaller fields. From aerial mapping there appears to be large trees along field boundaries. The Bubwith Rail Trail (disused railway) running through this land area is screened by many trees.	A disused railway line which is allocated as local open space for leisure and recreation and is also a public right of way and bridleway known as the Bubwith Rail Trail crosses through the middle of this land area diagonally and thus would separate the area into two sections (north and south). A residential dwelling along with four large polytunnels are located in the middle of this land area, adjacent to a small number of agricultural barns. There are a number of pylons which cross this land area diagonally. Seven PRoW are located within or along the boundary of this land area.	This land area is owned by multiple landowners, as it comprises several fragmented land titles, and therefore has complex land ownership. The northern part of the land area consists of small separate holdings, particularly close to Highfield and Harlthorpe. .	No. This land area has multiple landowners, some of which have small holdings, which is considered complex for land assembly. Field sizes in the northern part of this land area are also relatively small with existing boundary vegetation. There are several land use constraints including the Bubwith Rail Trail and other PRoW which would make this land area fragmented and potentially operationally inefficient when offsets are incorporated.	N/A

Land Area Ref	Size (ha) and location	Operational considerations	Land use constraints	Land availability and assembly	Reasonably available land area?	Relevant Solar PV Site Reference if already included within the Solar PV Site
D	134 ha of land east of Foggathorpe, to the west of the River Foulness.	Online mapping indicates that the land area is relatively flat. The land area is also of an irregular shape and field sizes relatively small. There are many trees and hedgerows within this land area along field boundaries, which may result in shading.	There are several residential dwellings around Foggathorpe which are west of this land area. Adjacent land to the west also appears to be a holiday business known as New Holland Country Park which comprises fishing lakes and holiday cottages. A number of residential dwellings with private access tracks are located within this land area which fragment the land area. A disused railway line which is allocated as local open space for leisure and recreation and is also a public right of way and bridleway known as the Bubwith Rail Trail crosses the northern part of this land area which would separate it from the southern area. A PRoW runs along the western boundary of this land area.	This land area has complex land ownership with many titles. Land was not offered by the landowner for inclusion within the Scheme and is therefore not available.	No. This land area was not offered by the landowner for inclusion in the Scheme and comprises many land titles and therefore complex ownership. It also has several land use constraints including the Bubwith Rail Trail and residential dwellings which would fragment the land area making it potentially operationally inefficient.	N/A
E	174 ha of land to the west of Willitoft, between Street Lane and Willitoft Road.	Online mapping indicates that the land area is relatively flat. This land area comprises relatively small fields with boundaries lined with trees that may cause shading.	A small part of this land area to the west falls within a Mineral Safeguarding Area. This land area surrounds Elder Farm and other residential dwellings within Willitoft to the east. There are electricity pylons present which cross through the middle of this land area. Two PRoW are located adjacent to this land area.	Land not offered by the landowner for inclusion within the Scheme and therefore not available.	No. This land area was not offered by the landowner for inclusion in the Scheme .	N/A
F	205 ha of land to the east of Willitoft, south of the Bubwith Rail Trail, between	Online mapping indicates that the land area is relatively flat. There are two areas of woodland, as well as many tree lined fields	The western part of this land area surrounds Hall Farm and other residential dwellings within Willitoft to the west.	The landowner agreed for the eastern extent of this land area to be included within the Scheme.	Yes, partially available. The eastern extent of this land area is available as it was offered for inclusion in	1a, 1c and 1d

Land Area Ref	Size (ha) and location	Operational considerations	Land use constraints	Land availability and assembly	Reasonably available land area?	Relevant Solar PV Site Reference if already included within the Solar PV Site
	Bell Lane and Willitoft Road.	within the western extent of this land area which have the potential to cause shading.	There are electricity pylons present which cross through the northern section of this land area. Willitoft Road runs within the western extent of this land area. Two PRoW are located within this land area.		the Scheme and it has limited land use constraints.	
G	87 ha of land to the north of Gribthorpe, east of Bell Lane and south of Foggathorpe.	Online mapping indicates that the land area is relatively flat. The existing land area comprises fields, some lined with trees but there are also fishing lakes and holiday lets in the northern part of this land area.	This land area is located adjacent to the residential dwellings at Gribthorpe which are located to the south. There are fishing lakes and holiday cottages within the northern part of this land area which fragment the land mass available for solar development and would require offsetting. Sewer Dike also crosses this land area through the middle, further fragmenting it. There are two PRoW within this land area, one through the eastern area of the land.	Part of the land area was offered following the non-statutory consultation.	No. This land area has operational and land use constraints which would fragment the land area making it potentially operationally inefficient and the existing land use in the northern part of the land area would be displaced by a Solar PV Area at this location.	N/A
H	71 ha of land to the east of Gribthorpe and west of the River Foulness.	Online mapping indicates that the land area is relatively flat. It has large open fields with limited trees and vegetation.	Residential dwellings (at Gribthorpe) and agricultural barns are located to the west of this land area. No PRoW are within this land area.	There are three landowners of this land area who offered their land following non-statutory consultation. One of the landowners offered their land for mitigation only with no solar PV; and the other two landowners offered their land for solar PV. Further land negotiations following non statutory consultation identified that one landowner was able to offer their land for solar PV with the other two as mitigation land only.	Yes – partially available. Part of the land is available for the development of solar PV however the majority of the land is only available for ecological mitigation. Given the Scheme's requirements for ecological mitigation, the Applicant has included the land area in the Scheme for this mitigation.	1g and 1h for ecological mitigation only.

Land Area Ref	Size (ha) and location	Operational considerations	Land use constraints	Land availability and assembly	Reasonably available land area?	Relevant Solar PV Site Reference if already included within the Solar PV Site
I	235 ha of land south and east of Gribthorpe,	Online mapping indicates that the land area is relatively flat. Small areas of woodland and tree lined field boundaries are located within this land area which may cause shading and require offsets.	This land area comprises Grade 4 agricultural land. Residential dwellings at Gribthorpe are located to the north of this land area. An agricultural barn is located to the north east of this land area. There is a small waterbody located within the south west of this land area. There are four PRoW within this land area.	This land area is owned by three landowners who agreed for the majority of this land to be included within the Scheme. The northern extent of the land area, immediately south of Gribthorpe, and the western extent are not available.	Yes – partially available. The majority of this land area is available and already included in the Solar PV Site. It also has limited land use conflicts.	1b and 1e
J	274 ha of land to the west of Spaldington,and north and east of Boothferry Golf Club and Spaldington Golf Range.	From mapping it would appear the land area is relatively flat. The village of Spaldington to the east is screened by a small woodland, and Winfield lakes are also surrounded by trees which may cause shading within this land area.	This land area is located to the west and north west of the village of Spaldington. Part of this land area is used for wind turbines and adjacent to the west is an anaerobic digester plant. Winfield lakes is a fishing lakes complex and this is located in the northern part of this land area. Boothferry Golf Club and Spaldington Golf Range is located adjacent to the west and south of this land area. Part of Willitoft road passes through this land area One PRoW crosses this land area.	The north western, and south eastern parts of this land area were offered for inclusion within the Scheme. These are under the same land ownership as part of land area ‘N’ therefore reducing affected land interests. The area of land directly to the north west of Spaldington and the area close to the anaerobic digestion plant were not offered for the Scheme	Yes – partially available. Part of this land area is available and is included in the Solar PV Site.	2b and 2e
K	153 ha of land to the east of Spaldington and west of the River Foulness.	Online mapping indicates that the land area is relatively flat. Small areas of woodland and tree lined field boundaries are located within this land area which may cause shading and require offsets	The western extent of this land area is adjacent to residential properties in the village of Spaldington which lies to the west and south.	The landowner has agreed for the eastern extent of this land to be included within the Scheme.	Yes – partially available. Part of this land area is available and is included in the Solar PV Site	1e and 1f

Land Area Ref	Size (ha) and location	Operational considerations	Land use constraints	Land availability and assembly	Reasonably available land area?	Relevant Solar PV Site Reference if already included within the Solar PV Site
			A small section of the western end of this land area lies within a Minerals Safeguarding Area. There is one PRoW and one Bridleway within this land area.			
L	228 ha of land to the south east of Spaldington and north of Spaldington Road.	Online mapping indicates that the land area is relatively flat. The western part of this land area comprises relatively small fields with boundaries lined with trees that may cause shading.	This land area is adjacent to residential properties in the village of Spaldington to the north west and individual properties to the southwest along Spaldington Road. The eastern part of this land area lies within a Mineral Safeguarding Area. Oak Tree Farm is located within this land area which has a lake and is surrounded by a small, wooded area. There are five PRoW and two Bridleways within this land area.	This land area was not offered up for inclusion in the Scheme. Part of this land area is also understood to be tenant farmed, which means there are additional land interests to seek agreement with.	No. This land area was not offered by the landowner for inclusion in the Scheme and would affect additional land interests as it is understood there are areas of tenanted farmed land. .	N/A
M	148 ha of land adjacent to the west of the A614.	From mapping it would appear the land area is relatively flat. This land area comprises relatively small fields with boundaries lined with trees that may cause shading. There is a large area of woodland in the western part of this land area.	This land area is adjacent to individual residential properties located along the A614 to the east. Featherbed drain runs through the middle of this land area. One PRoW and one Bridleway are located within this land area.	A large proportion of this land area is unregistered land with no known landowners.	No. With significant areas of unregistered land this land area is not available due to the uncertainty of land ownership.	N/A
N	3358 ha of land adjacent to the west of the A614, and to the north of the Hull to Leeds railway line.	Online mapping indicates that the land area is relatively flat. The majority of this land area includes large open fields. However in the north western area there are areas of woodland and tree belts which may cause shading.	This land area is adjacent to individual properties located along the A614 to the east and along Spaldington Road to the north. A railway line which runs from Hull to Leeds borders this land area to the south.	Through discussions with landowners the Applicant identified that the majority of this land area is available for inclusion in the Scheme.	Yes – partially available. Part of this land area is available and is included in the Solar PV Site. There are minimal land use constraints, within the land area,	2f and 2g

Land Area Ref	Size (ha) and location	Operational considerations	Land use constraints	Land availability and assembly	Reasonably available land area?	Relevant Solar PV Site Reference if already included within the Solar PV Site
			Featherbed drain runs through the middle of this land area. One PRoW and one Bridleway are located within this land area.			
O	152 ha of land to the east of Wressle, bordered to the south by the Hull to Leeds railway line.	Online mapping indicates that the land area is relatively flat. The land area includes large open fields. There are areas of woodland within and adjacent to the western part of this land area, which may cause shading.	This land area is immediately east of the village of Wressle. Small areas of this land area fall within a Mineral Safeguarding Area. A railway line which runs from Hull to Leeds borders this land area to the south. Electricity pylons and Wood Lane cross through the middle of this land area. There is one PRoW within this land area.	This land area is owned by two landowners. The land to the west was not offered for inclusion in the Scheme by one of the landowners. The land to the east was agreed to be included in the Scheme by the other landowner.	Yes – partially available. Part of this land area (eastern area) is available for inclusion in the Scheme, however land to the west is not available.	3b

5. Conclusion

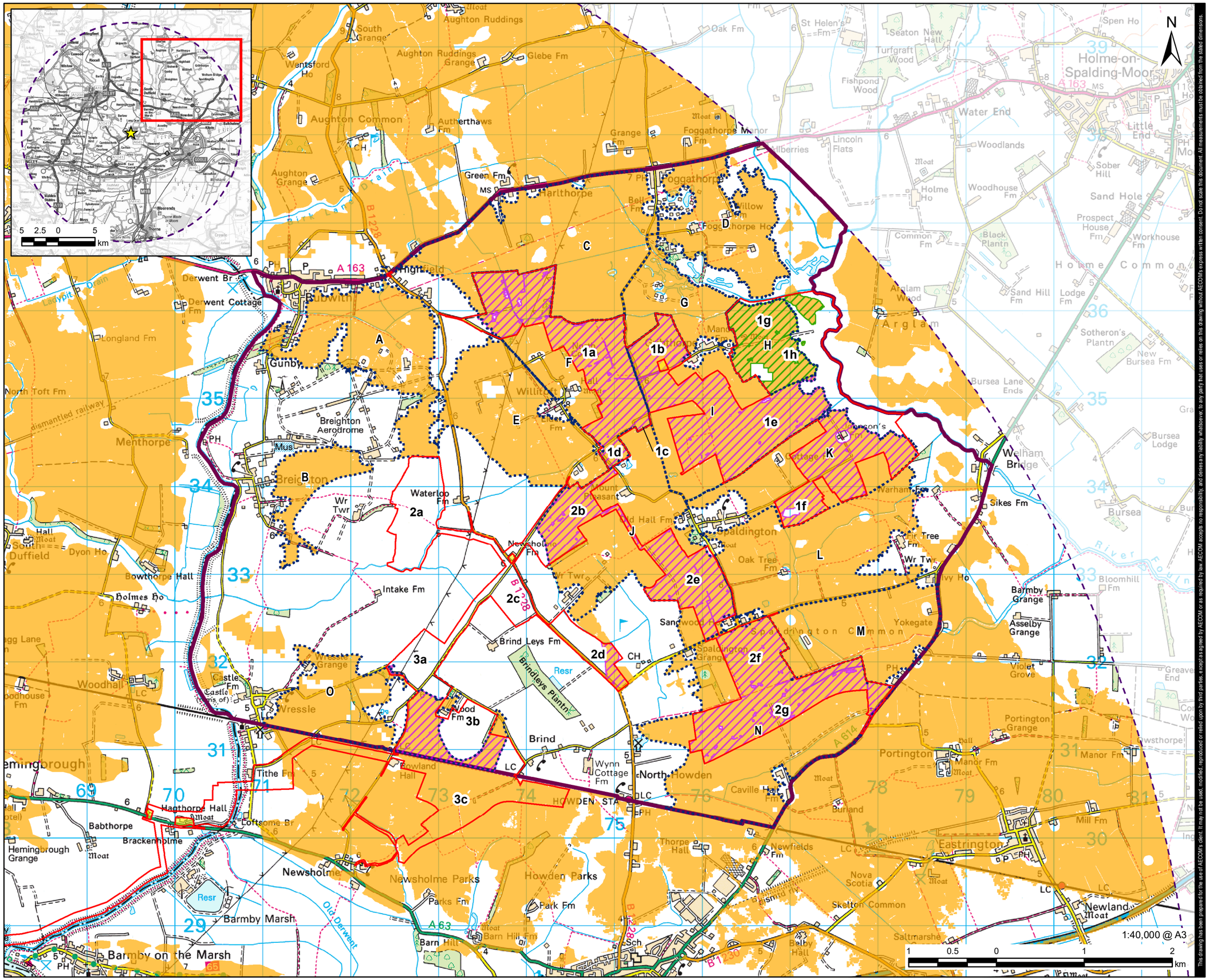
5.1.1 The purpose of this Sequential Test report has been to determine if there are any reasonably available areas of land of lower probability of flooding which would be suitable for the Solar PV Site to confirm whether the Sequential Test has been applied as part of site selection in accordance with NPS EN-1 and draft NPS EN-1.

5.1.2 The assessment identified an initial area of search (Stage 1) and from this, a refined area of search, which was identified using the Applicant's approach to site selection (Stage 2). All areas of land which are at the lowest risk of flooding (fluvial and surface water) or not susceptible to ground water flooding were then identified (Stages 3 and 4) and assessed (Stage 5).

5.1.3 The assessment included a consideration of operational requirements; land use constraints and land availability and assembly for a total of 15 areas of land (land areas A to O) at the lowest risk of flooding.

5.1.4 Of the 15 land areas within the identified unconstrained land assessed, parts of six land areas were considered available and suitable for the Solar PV Site. One of these land areas was also partly available for ecological mitigation. This available land at low risk of flooding is included as part of the Scheme's Solar PV Site and Ecology Mitigation Area (see **Figure 5-1**). Given the Applicant's land requirements to deliver the Scheme and the availability and suitability of land areas at lowest risk of flooding it has therefore been necessary to use land at a higher risk of flooding.

5.1.5 In summary, a sequential approach has been applied in selecting the land for the Scheme. The Scheme has been located, as far as possible, in areas with the lowest risk of flooding from any source therefore demonstrating the Sequential Test as part of site selection has been met in accordance with NPS EN-1 and draft NPS EN-1.



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LEGEND

- Order limits
- Land not included in the Order limits
- Refined Area of Search from Point of Connection
- Initial Area of Search
- Indicative Additional Individual Land Parcel Boundary
- Unconstrained Land
- Ecological Mitigation Area within Unconstrained Land
- Solar PV Site within Unconstrained Land

NOTES

ISSUE PURPOSE

Sequential Test Report

PROJECT NUMBER

60683115

FIGURE TITLE

The Order limits and land considered suitable and available for the Scheme

FIGURE NUMBER

Figure 5-1

6. References

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