



BICKER FEN SOLAR FARM

CUMULATIVE LANDSCAPE AND VISUAL EFFECTS

March 2023



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CH4 0DH

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1.0 Introduction

1.1.1 In August 2022, a planning application was made to Boston Borough Council and South Holland District Council in relation to the proposed Bicker Fen Solar Farm (the Proposed Development). A Landscape and Visual Impact Assessment (LVIA) of the Proposed Development formed part of the planning submission.

1.1.2 Post-submission comments received from North Kesteven District Council raised the issues of cumulative landscape and visual effects. Their comments were summarised as follows:

“NKDC therefore wishes to highlight the potential for the development of the solar farms at Little Hale and Heckington Fen to enable assessment of the cumulative impacts in association with the proposed solar farm at Bicker Fen taking into account also the recent permission for a solar farm to the immediate north of this within Boston Borough. Views of the Little Hale and Bicker Fen solar farms may be possible in combination from the embanked bridleway running along the eastern bank of the South Forty Foot Drain, and therefore consideration of cumulative impacts should include visual impact, loss of agricultural land and the consideration of the cable connection route. It is understood that the cable connection corridor/connection point might be shared with/overlap that proposed for the Temple Oaks solar farm at the former Folkingham airfield and which is currently with PINS for a scoping opinion as a registered NSIP scheme”.

1.1.3 This report has been prepared in order to address cumulative landscape and visual effects, and should be read alongside the LVIA submitted in August 2022. The report has been authored by the same team responsible for the LVIA.

2.0 Methodology

2.1.1 Guidance regarding cumulative effects is set out in *Guidelines for Landscape and Visual Impact Assessment*¹, hereafter referred to as the GLVIA. The GLVIA identifies that cumulative landscape and visual effects are those that:

“...result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other development (associated with or

¹ Landscape Institute and Institute for Environmental Management and Assessment, 3rd edition 2013. *Guidelines for Landscape and Visual Impact Assessment*. Abingdon: Routledge.

separate to it), or actions that occurred in the past, present or are likely to occur in the foreseeable future”.²

2.1.2 The GLVIA goes on to identify that:

“The challenge is to keep the task reasonable and in proportion to the nature of the project under consideration. Common sense has an important part to play in reaching agreement about the scope of the assessment. Where the competent authority and other stakeholders are uncertain about the preferred approach the landscape professional may have to exercise judgement about what is appropriate and be able to justify the approach taken. It is always important to remember that the emphasis in EIA is on likely significant effects rather than on comprehensive cataloguing of every conceivable effect that might occur...”³

2.1.3 The (non-cumulative) LVIA addresses the effects of introducing the Proposed Development into a context where other existing development (including development under construction) is present. The presence of this other existing development forms part of the assessment baseline.

2.1.4 The cumulative LVIA is concerned with the effects of the Proposed Development based upon the presence of the following:

- Other existing development that has planning consent but for which the development timescale is unknown;
- Other development that is the subject of a formal application for development consent.

2.1.5 It is not typical to include development that is at the pre-planning application stage as there is generally a lack of information about such development, and as such the implications of these types of development upon the landscape and visual resource are not ‘reasonably foreseeable’. However, where a scheme at this stage is of particular relevance to the assessment, it may be included, but should be given limited weight in the decision making process as the proposals may be subject to significant change prior to submission.

² Ibid, paragraph 7.2

³ Ibid, paragraph 7.5

3.0 Baseline

Existing Development

- 3.1.1 As noted in the LVIA, there are a series of existing electricity generation and supply infrastructure developments in the vicinity of the Bicker Fen Site. Refer to Figure A for locations.
- 3.1.2 The Bicker Wind Farm is located approximately 875m to the west of the Bicker Fen Site. This development comprises 13 no. wind turbines which are widely visible in the flat landscape.
- 3.1.3 Immediately east of the wind farm is the Bicker Fen National Grid Substation (approximately 350m from the Bicker Fen site). The Substation is partially enclosed by woodland, but some of the structures within it can be seen from the surrounding area.
- 3.1.4 A second substation located north of the wind farm (approximately 1.7km from the Bicker Fen site) provides a connection to the Triton Knoll offshore wind farm (substation construction completed in October 2021).
- 3.1.5 The Viking Link is a major construction project located west of the Bicker Fen Site and will once completed link the national grids of the UK and Denmark. The UK terminus of the project is due south of the wind farm (approximately 150m from the Bicker Fen site) and will include two convertor sites. These were under construction at the time of the field visit in November 2021 and were very prominent (although still incomplete) structures. A large construction compound was present at the convertor sites, and the construction access road running southward from this was also evident in the landscape. The Viking Link is anticipated to be commissioned at the end of 2023.

Consented Development

- 3.1.6 A proposal to develop a 49MW solar farm at Vicarage Drove adjacent to the wind farm (approximately 620m west of the Bicker Fen site) was approved by Boston Borough Council in February 2022. Construction is anticipated to commence during 2023. Refer to Figure A for location.

Development in Planning

- 3.1.7 An application to develop a solar farm with a capacity in excess of 50MW at Heckington Fen Energy Park was submitted to the Planning Inspectorate in February 2023. At the time of writing, full details of the application had not been uploaded to the National Infrastructure Planning website, but the Preliminary Environmental Information Report (dated June 2022) was available. The solar farm itself is located more than 5km north of the Bicker Fen Site, but the associated grid connection would run southwards (underground) to the Bicker Fen National Grid Substation. An extension to the Substation would also be required, comprising new structures of up to 15m in height, located within the existing Substation compound.
- 3.1.8 Given the distance between the Bicker Fen site and the Heckington Fen solar farm, there are likely to be very few if any locations from which both developments would be visible and significant effect likely to occur. In what is a very flat landscape, there are no elevated locations from which long-range vistas are available, and screening features such as belts of vegetation or embankments typically provide very effective screening. This is confirmed in the draft PEIR for the Heckington Fen Energy Park which excludes Bicker Fen from its cumulative baseline due to separation distance. **Image 1** overleaf is taken from the draft PEIR and illustrates those site included in the cumulative baseline for Heckington Fen Energy Park, which does not include Bicker Fen Solar Farm.
- 3.1.9 **Image 2** overleaf is also taken from the draft PEIR and illustrates the Zone of Theoretical Visibility (ZTV) based on a digital surface model for the area. This illustrates that the visibility of the Heckington Fen Energy Park is largely confined to the north of the South Forty Foot Drain by raised banks along the drain and vegetation.

Image 1: Extract from Heckington Fen Energy Park PEIR in respect of Cumulative Baseline

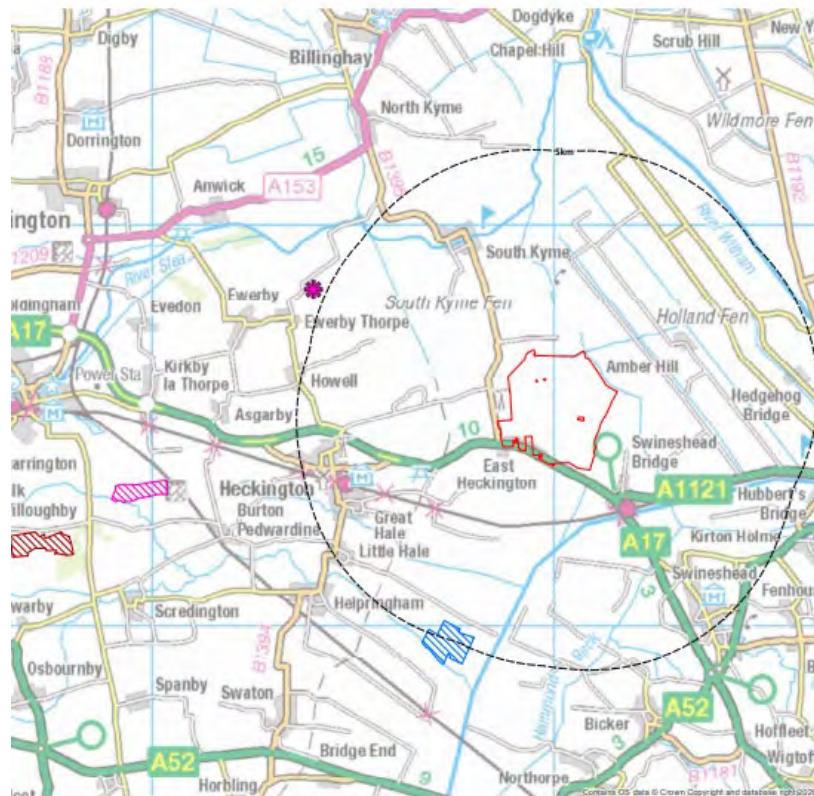
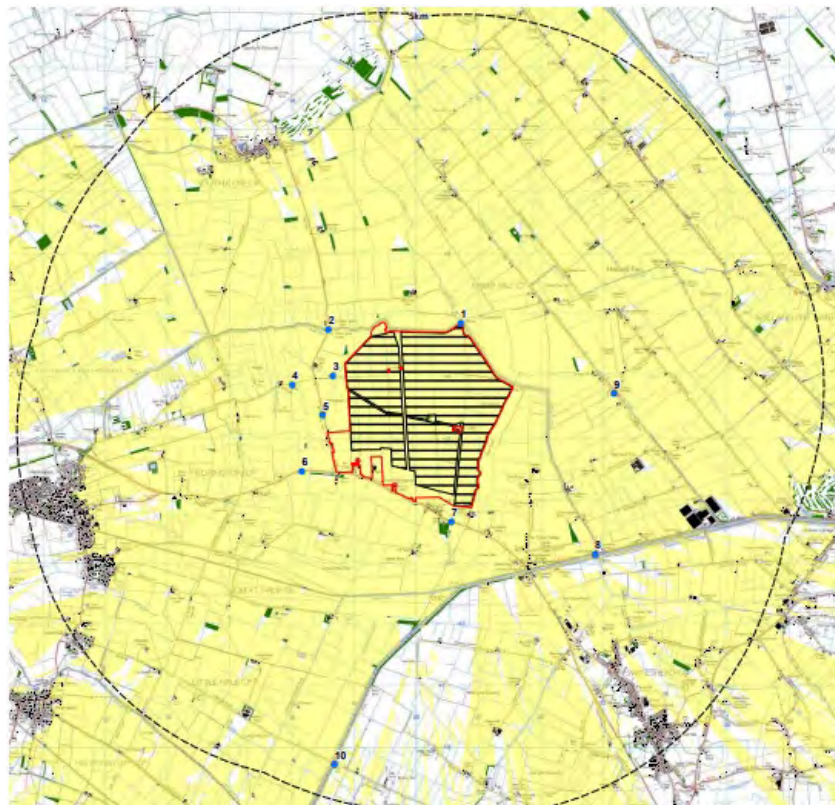


Image 2: Extract from Heckington Fen Energy Park PEIR in respect of Digital Surface Model ZTV



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- 3.1.10 Due to separation distances in excess of 5km and the screening effect of the embankment and associated vegetation along South Forty Foot Drain no further consideration has been given to the effects of the Heckington Fen Solar Farm. Some commentary is provided in the assessment regarding the effects of the Heckington Fen grid connection.
- 3.1.11 A proposal to develop a 49MW solar farm at Little Hale Fen was at the time of writing subject to a negative EIA screening opinion. Little Hale Fen is located to the west of the South Forty Foot Drain, approximately 2.4km west of the Bicker Fen Site (refer to Figure A for location). A planning application is currently being prepared and will be submitted in 2023. For the purposes of this cumulative assessment this project has been treated as if submitted.

Scoping Stage Development

- 3.1.12 A proposal to develop a solar farm with a capacity in excess of 50MW at the Temple Oaks Renewable Energy Park is in its early stages. A Scoping Report for this scheme was submitted to the Planning Inspectorate in June 2022, and a Scoping Opinion received in August 2022. The solar farm itself would be located approximately 14.5km south-west of the Bicker Fen site. The associated grid connection would run underground from this along the public highway network to the Bicker Fen National Grid Substation.
- 3.1.13 At set out in Section 2.0 it is not customary to include scoping stage schemes within a cumulative assessment due to the lack of detail regarding these. As such, and given the distance between the Bicker Fen site and the Temple Oaks site, no further consideration has been given to the effects of the Temple Oaks Solar Farm. Some commentary is provided in the assessment regarding the effects of the Temple Oaks grid connection.

4.0 Visualisations

ZTV

- 4.1.1 Zone of Theoretical Visibility (ZTV) mapping of the Bicker Fen scheme, the Vicarage Drove scheme, and the Little Hale Fen scheme is displayed on Figures Bi-iii respectively. The methodology by which the ZTVs have been produced is set out in Appendix 2 of the LVIA and is not repeated here.

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- 4.1.2 The ZTVs shown on Figures Bi-iii are presented differently to those included in the LVIA. Figures Bi-iii simply show locations where the solar panels of the respective schemes are predicted to be visible, rather than show what proportion of the overall scheme would be visible (as was the case on the LVIA) Figures. Additionally, the ZTVs shown on Figures Bi-iii do not take account of any proposed mitigation via planting, and hence reflect a worst-case scenario of visibility.
- 4.1.3 Figure C shows a cumulative ZTV which indicates locations from which more than one of the three schemes are predicted to be visible. It can be seen by reference to this Figure that the embankments and associated vegetation along either side of the South Forty Foot Drain provide an effective visual barrier, with visibility of Little Hale Fen largely occurring to the west, and visibility of Bicker Fen and Vicarage Drove largely occurring to the east. The western embankment is noticeably higher than the eastern embankment as illustrated in **Image 3** below and this restricts views to the proposed solar farm at Little Hale Fen for users of the public right of way that runs on top of the eastern embankment.

Image 3: View north along South Forty Foot Drain illustrating raised western embankment



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- 4.1.4 There is considerable overlap in the ZTVs of Bicker Fen and Vicarage Drove, as would be expected given their close proximity to one another within a flat and open landscape. However, additional overlap with Little Hale Fen is limited due to the screening afforded by the raised western embankment along South Forty Foot Drain.

5.0 Assessment of Effects

Landscape Fabric

Solar Farms

- 5.1.1 Each of the three solar farms would introduce new solar panels and associated infrastructure, thereby removing their respective sites from arable use. Each scheme would however be grazed for the duration of their operational life, and there would only be a limited reduction in the extent of farmland (both individually and cumulatively) necessary to accommodate some elements of solar farm infrastructure (new access routes, transformer stations, control rooms etc).
- 5.1.2 Additionally, each of the three schemes would include landscape enhancements comprising a mixture of new native woodland and hedgerow planting, new species-rich field margins and changes to the management of existing boundary vegetation. Details would vary from scheme to scheme, but the overall changes associated with each would be similar.
- 5.1.3 In cumulative terms, there would be a localised effect resulting from the change from arable to pasture, and the loss in some areas of farmland. The overall loss in vegetation would be adverse, but given the small areas of land involved would not be significant.
- 5.1.4 The change from arable to pasture is likely to result in increased biodiversity due to the greater variety of species present, and as such this is likely to have a limited beneficial effect for the operational life of each development. Effects would not be significant.
- 5.1.5 The creation of species-rich field margins, new native woodland and hedgerow planting and enhanced management of existing boundary vegetation would have benefits in terms of biodiversity enhancement and would help to screen the solar farms from view, once planting has established. This would have a beneficial effect which would continue beyond the operational life of the solar farms. Effects would not be significant.

Grid Connection

- 5.1.6 The grid connections for the various solar farms would typically be routed along the public highway network. The connection from Vicarage Drove would run directly into the adjacent Bicker Fen National Grid Substation. The connection from Heckington Fen would run largely through farmland between that site and the Bicker Fen National Grid Substation. All the connections would be underground.
- 5.1.7 All connections would require temporary excavations as part of construction, in order to lay cables. Excavations would be filled in once construction is complete, and it has been assumed that in all cases, land would be reinstated to the existing vegetation cover. It has been assumed that where connection routes cross watercourses or areas of tree/ hedgerow cover, that directional drilling would be used, and that there would be no disturbance to these features. It has also been assumed that works would be undertaken on a progressive basis, and that only short stretches of excavation would be present at any one time.
- 5.1.8 The effects of grid connection works for individual schemes would be very localised and would be very limited in duration. Cumulatively, the effects of grid connection works on landscape fabric would not be appreciably different, and would not be significant.

Landscape Character

- 5.1.9 The LVIA concludes that:

“The Proposed Development would introduce solar panels and associated infrastructure into the Site. Electricity generation and supply infrastructure, including renewable energy is an established influence locally (e.g. the Bicker Wind Farm, the Triton Knoll Offshore Substation, and the Viking Link Converter), and there is a clear trend for further such development to be located locally (e.g., the consented Vicarage Drove Solar Farm, and the proposed Little Hale Fen Solar Farm). The Proposed Development would accord with this trend.

In the medium and longer term, the planting of new hedgerows and woodland belts would provide visual screening, and the influence of the new structures would therefore reduce. The new planting and new species-rich grassland would enhance biodiversity locally. The new planting would also increase the level of enclosure within the landscape locally, which would reflect current trends to enclose electricity infrastructure with planting.

There would be some localised change in character, particularly initially as the new solar panels and associated features are introduced but change from baseline would be limited. Effects would be minor to moderate adverse and would not be significant. The associated landscape proposals would have a beneficial effect as new planting establishes”.⁴

- 5.1.10 As can be seen, this conclusion is made with regards to the presence of the consented solar farm at Vicarage Drove and the proposed solar farm at Little Hale Fen. Cumulative effects upon landscape character would therefore be as stated above, i.e. minor to moderate adverse and not significant.
- 5.1.11 The grid connection works associated with the various schemes (including Heckington Fen and Temple Oaks) would have no influence upon landscape character once construction is complete. During construction, any influence upon the surrounding landscape would be very localised and would have a negligible effect upon character.

Visual Effects

- 5.1.12 The visual effects of the Proposed Development are described in paragraphs 5.1.22-5.1.42 of the LVIA. In summary, there would be short-term and localised significant visual effects experienced by residents in twelve properties located close to the Site boundary, by users of an approximately 500m stretch of the Cross-Britain Way, and by users of the footpath that runs along the Site boundary. As the proposed new planting at the Site boundary establishes, views of the new structures would be largely screened from view. In the medium and longer-term, visual effects would not be significant.
- 5.1.13 In the wider context, the Proposed Development would be a limited addition to the view, appearing less prominent than existing development. As the landscape proposals establish, this limited visibility would reduce further. The presence of the solar panels and associated structures would have little influence upon the wider views available, and effects would not be significant.
- 5.1.14 In a cumulative baseline where the consented solar farm at Vicarage Drove and the proposed solar farm at Little Hale Fen are also present, the further presence of the

⁴ Ibid, paragraphs 5.1.19-5.1.21

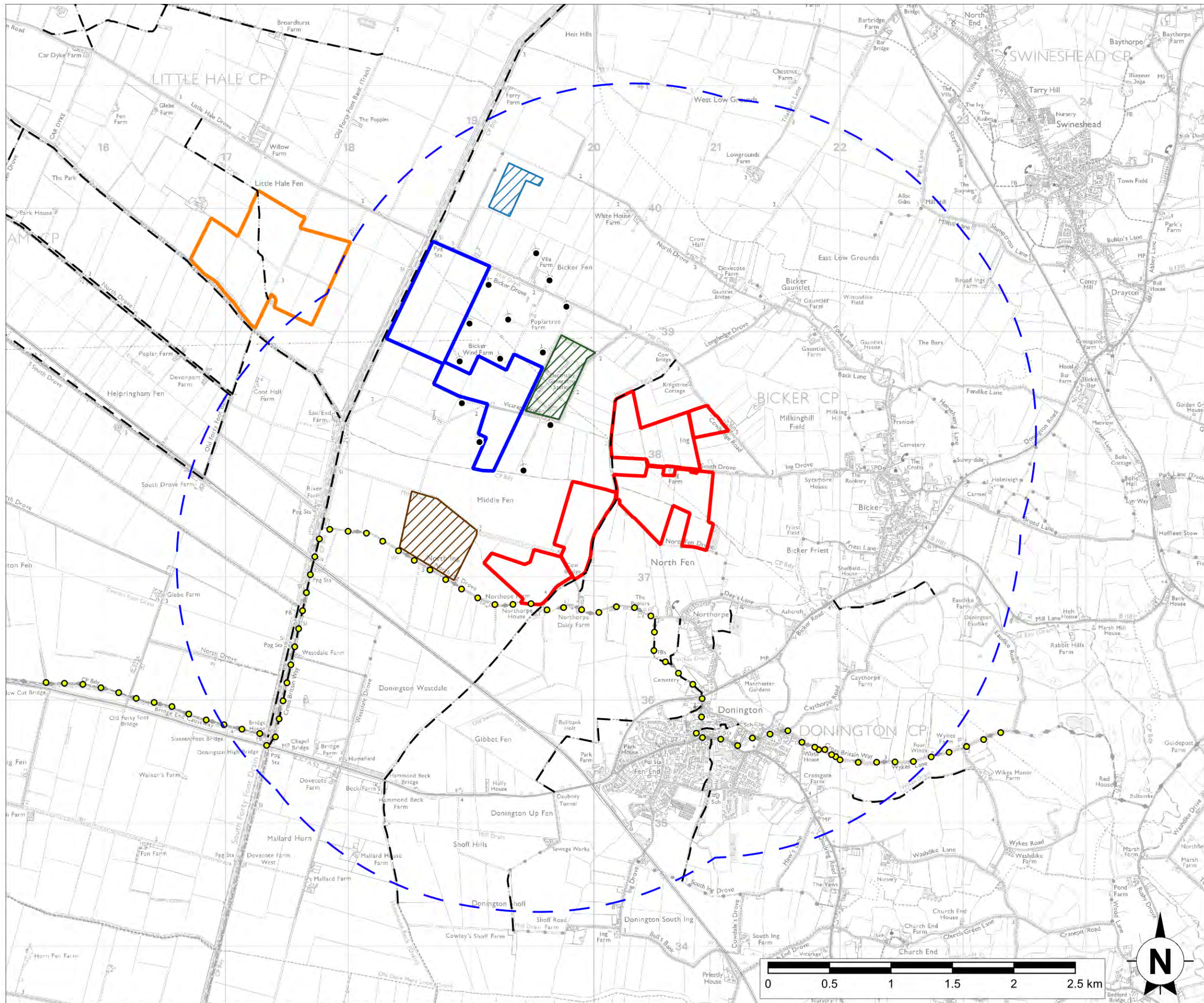
Proposed Development would not lead to appreciably different visual effects than those identified in the LVIA (as described above).

- 5.1.15 The well-established influence of electricity generation and supply infrastructure in views from the area east of the South Forty Foot Drove would intensify as a result of the Vicarage Drove Solar Farm and the extension to the Substation proposed as part of the Heckington Fen Solar Farm. Views of the Substation extension would be considerably restricted by the mature vegetation cover around much of the Substation compound, and views of the Vicarage Drove solar farm would also be restricted as proposed perimeter planting establishes.
- 5.1.16 The Little Hale Fen Solar Farm would be separated visually from the other schemes due to the level of screening provided by the embankments and vegetation along the South Forty Foot Drain. Little Hale Fen Solar would not be seen in combination with the Proposed Development and Vicarage Drove Solar Farm from the majority of the public right of way that runs along the top of the eastern embankment due to the raised western embankment as illustrated on **Image 3** above.
- 5.1.17 The Proposed Development would often be visible in views where the Vicarage Drove Solar Farm is also visible, along with the other existing infrastructure located east of the South Forty Foot Drain. Much of this infrastructure (e.g. the Bicker wind turbines and the Viking Link convertors) is visually prominent due to its height and or mass, and would remain appreciably more prominent than either solar farm, both of which would tend to be well screened over time by their associated landscaping.
- 5.1.18 Cumulative visibility with the Little Hale Fen Solar Farm would be limited. There would be some short stretches of the public rights of way network and the road network on either side of the South Forty Foot Drove from which both schemes would be visible, but in all cases views across the watercourse would be restricted by the adjacent embankments, and the solar farm on the further side (i.e. Bicker Fen as seen from the west of the watercourse, or Little Hale Fen as seen from the east) would be a very minor background presence, which would be largely screened from view.
- 5.1.19 The grid connection works associated with the various schemes (including Heckington Fen and Temple Oaks) would not be visible once construction is complete and vegetation reinstated. During construction any influence upon views would be confined to the immediate vicinity of excavations, and would have a negligible and short-term influence upon the views available.

6.0 Summary and Conclusions

- 6.1.1 The landscape and visual effects of the proposed Bicker Fen Solar Farm were described and assessed in the LVIA submitted in August 2022. In a context where other consented and proposed solar farm developments located nearby are also present, the further cumulative effects of the Bicker Fen Solar Farm would not differ appreciably from those identified in 2022 due to the location of cumulative sites relative to existing screening features in the landscape. The main cumulative landscape and visual effects would be experienced in the context of Vicarage Drove Solar Farm which will be part of a developing energy hub around the National Grid Substation that includes the existing substation infrastructure (and future planned expansions), Triton Knoll substation, Viking Link and the Proposed Development.
- 6.1.2 The area in the vicinity of the Bicker Fen Solar Farm site is already host to a series of prominent electricity generation and supply infrastructure, with additional further development benefitting from planning consent. The area is already an well-established 'energy hub' and the presence of this infrastructure characterises the landscape and the views available from the surrounding area.
- 6.1.3 The cumulative landscape and visual effects of the Bicker Fen Solar Farm would not be significant in this context and there would be no significant cumulative effects with Heckington Fen Energy Park or Little Hale Fen Solar Farm.

FIGURES



- Key
- Site Boundary (Bicker Fen)
 - 2.5km distance from Site Boundary
 - Cross Britain Way Long Distance Route
 - Public Right of Way
 - Vicarage Drove Solar Farm (consented)
 - Little Hale Fen Solar Farm (planning stage)
 - Viking Link Converter (under construction)
 - Triton Knoll Substation
 - Bicker Fen National Grid Substation
 - Bicker Wind Turbines

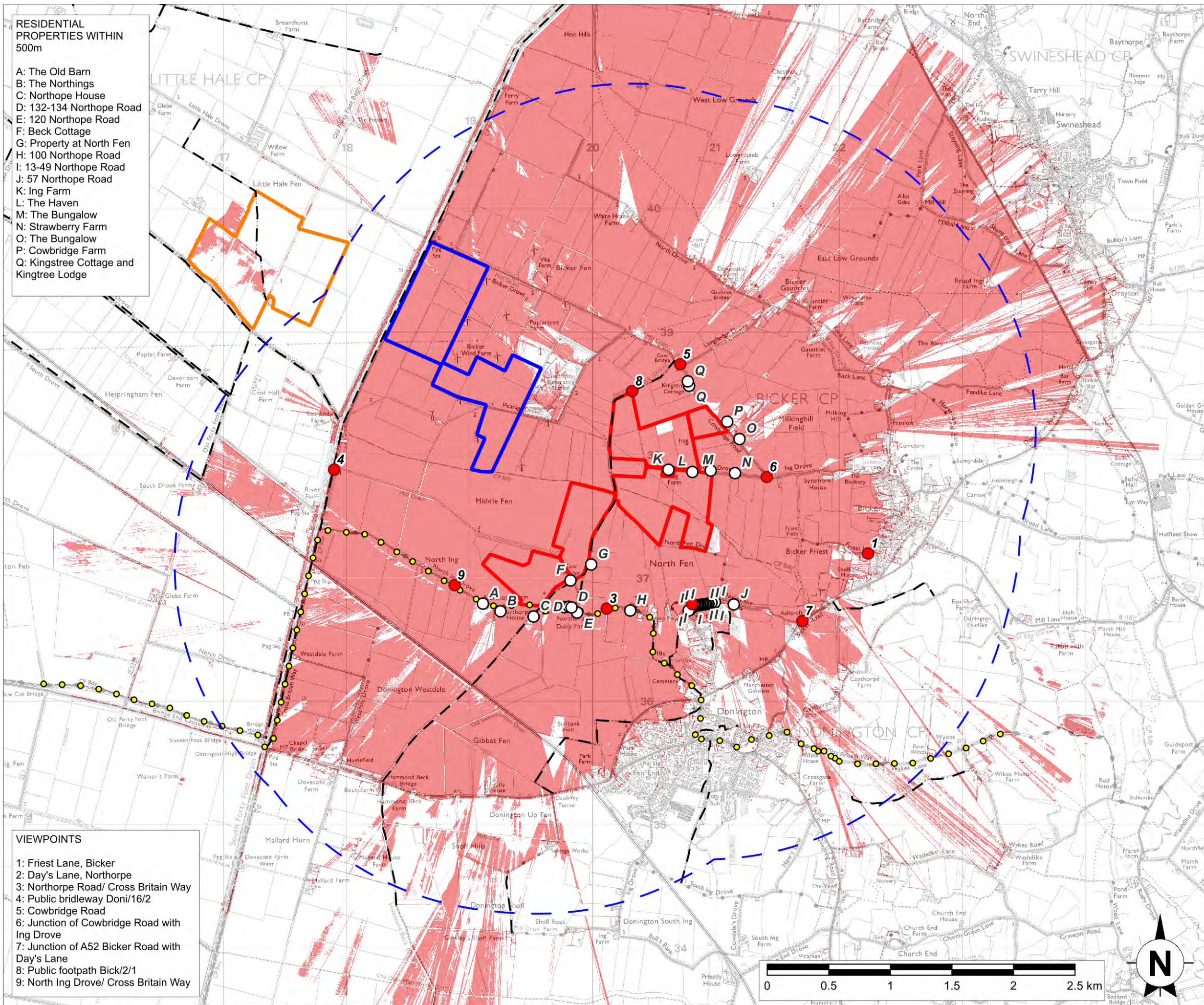
BICKER FEN SOLAR

Figure A

Existing, Consented and Proposed Development

Scale
1:30,000@A3

Date
March 2023



RESIDENTIAL PROPERTIES WITHIN 500m

A: The Old Barn
B: The Northings
C: Northope House
D: 132-134 Northope Road
E: 120 Northope Road
F: Beck Cottage
G: Property at North Fen
H: 100 Northope Road
I: 13-49 Northope Road
J: 57 Northope Road
K: Ing Farm
L: The Haven
M: The Bungalow
N: Strawberry Farm
O: The Bungalow
P: Cowbridge Farm
Q: Kingtree Cottage and Kingtree Lodge

VIEWPOINTS

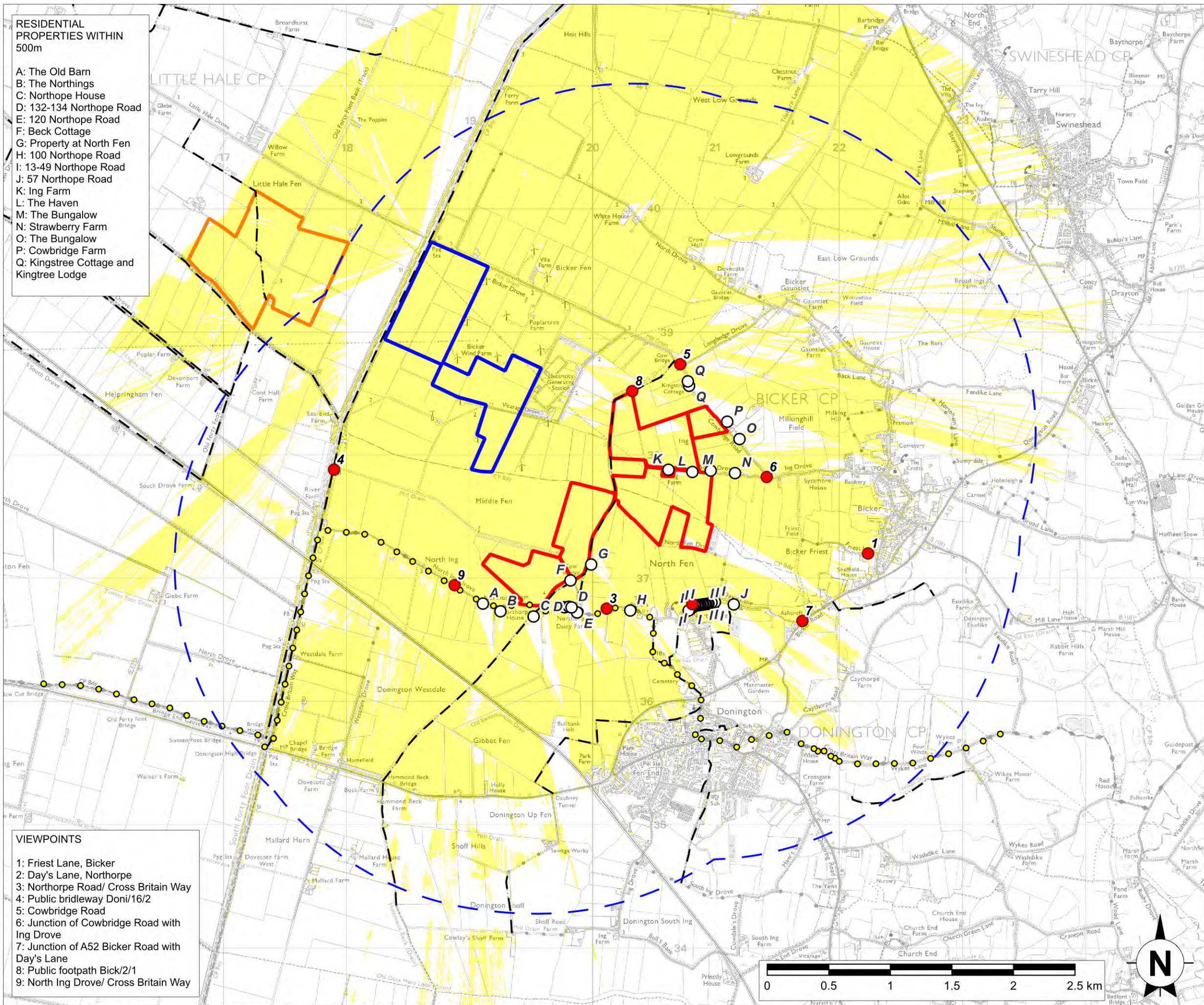
1: Friest Lane, Bicker
2: Day's Lane, Northorpe
3: Northorpe Road/ Cross Britain Way
4: Public bridleway Doni/16/2
5: Cowbridge Road
6: Junction of Cowbridge Road with Ing Drive
7: Junction of A52 Bicker Road with Day's Lane
8: Public footpath Bick/2/1
9: North Ing Drive/ Cross Britain Way

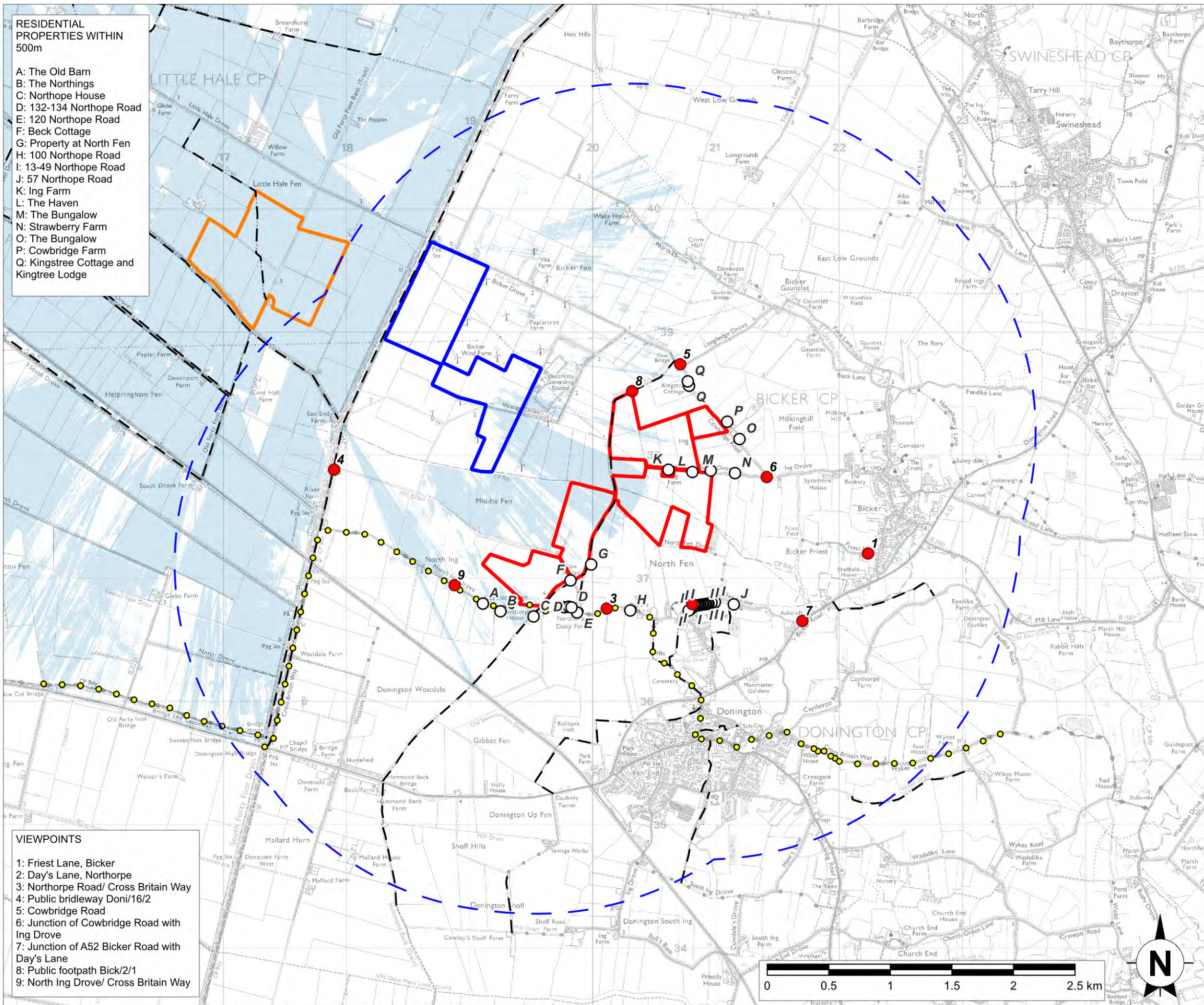
- Key
- Site Boundary (Bicker Fen)
 - 2.5km distance from Site Boundary
 - Vicarage Drive
 - Solar Farm (consented)
 - Little Hale Fen Solar Farm (planning stage)
 - Cross Britain Way Long Distance Route
 - Public Right of Way
 - Residential Properties within 500m of Site
 - Viewpoint Location
 - Bicker Fen ZTV

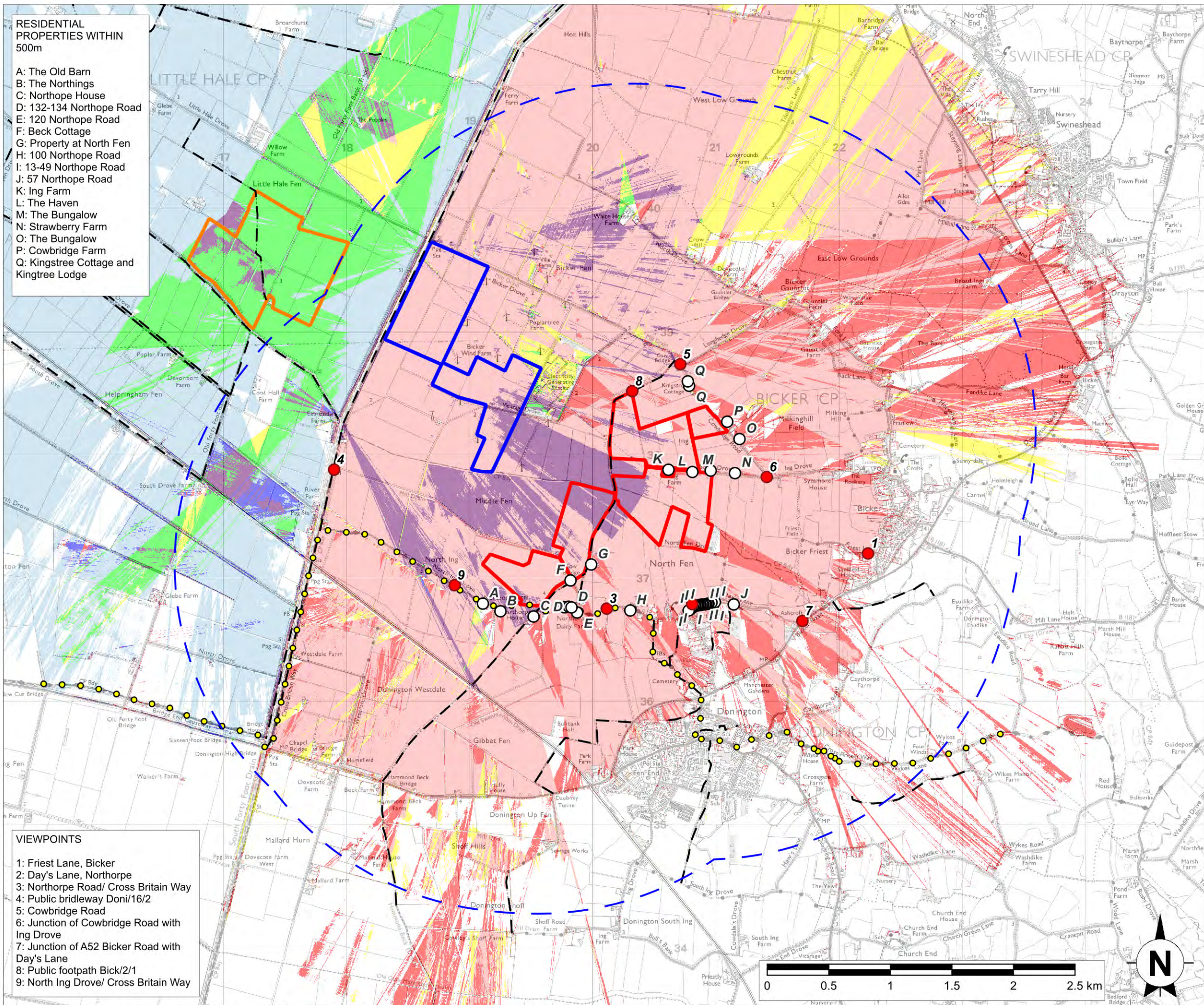
NOTES

1. Zone of Theoretical Visibility (ZTV) has been generated using BlueSky Mapping 2m photogrammetry Digital Surface Model (DSM) data, which reflects the presence of vegetation, buildings and other structures.
2. ZTV generation has allowed for the curvature of the earth, and for light refraction.
3. ZTV has been generated based upon an observer eye height of 1.7m above ground level
4. The ZTV does not reflect the presence of any proposed mitigation

BICKER FEN SOLAR	
Figure Bi	
Zone of Theoretical Visibility: Bicker Fen	
Scale 1:30,000@A3	Date March 2023







RESIDENTIAL PROPERTIES WITHIN 500m

A: The Old Barn
B: The Northings
C: Northope House
D: 132-134 Northope Road
E: 120 Northope Road
F: Beck Cottage
G: Property at North Fen
H: 100 Northope Road
I: 13-49 Northope Road
J: 57 Northope Road
K: Ing Farm
L: The Haven
M: The Bungalow
N: Strawberry Farm
O: The Bungalow
P: Cowbridge Farm
Q: Kingtree Cottage and Kingtree Lodge

VIEWPOINTS

1: Friest Lane, Bicker
2: Day's Lane, Northorpe
3: Northorpe Road/ Cross Britain Way
4: Public bridlway Doni/16/2
5: Cowbridge Road
6: Junction of Cowbridge Road with Ing Drove
7: Junction of A52 Bicker Road with Day's Lane
8: Public footpath Bick/2/1
9: North Ing Drove/ Cross Britain Way

axis

- Key
- Site Boundary (Bicker Fen)
 - 2.5km distance from Site Boundary
 - Vicarage Drove Solar Farm (consented)
 - Little Hale Fen Solar Farm (proposed)
 - Cross Britain Way Long Distance Route
 - Public Right of Way
 - Residential Properties within 500m of Site
 - Viewpoint Location
- Cumulative ZTV
- Bicker Fen theoretically visible
 - Vicarage Drove theoretically visible
 - Little Hale Fen theoretically visible
 - Bicker Fen & Vicarage Drove theoretically visible
 - Bicker Fen & Little Hale Fen theoretically visible
 - Vicarage Drove & Little Hale Fen theoretically visible
 - All three solar farms theoretically visible

NOTES

1. Zone of Theoretical Visibility (ZTV) has been generated using BlueSky Mapping 2m photogrammetry Digital Surface Model (DSM) data, which reflects the presence of vegetation, buildings and other structures.

2. ZTV generation has allowed for the curvature of the earth, and for light refraction.

3. ZTV has been generated based upon and observer eye height of 1.7m above ground level

4. The ZTVs do not reflect the presence of any proposed mitigation

BICKER FEN SOLAR	
Figure C	
Cumulative Zone of Theoretical Visibility	
Scale 1:30,000@A3	Date March 2023