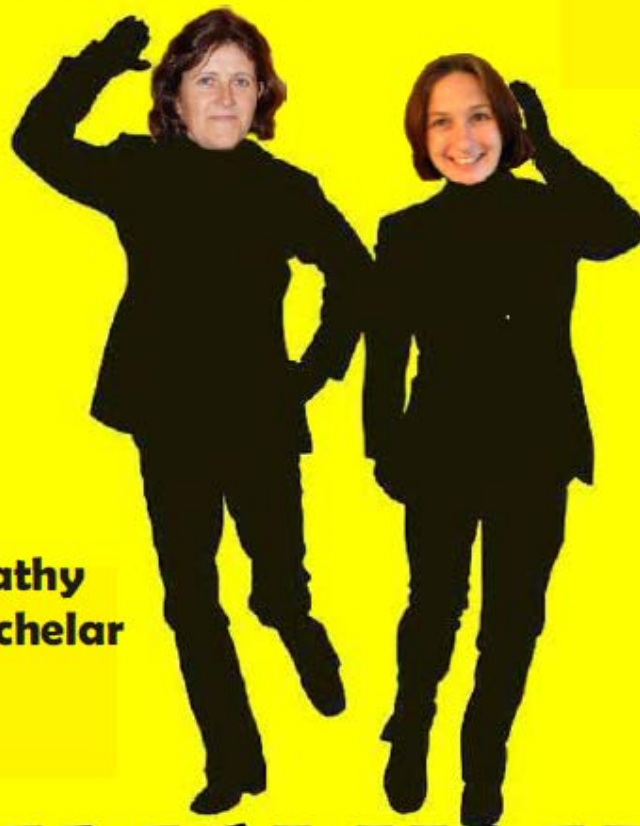


North Norfolk District Council: Experience of solar farm developments

**Cathy Batchelar
And
Kerys Witton**

Bring me...



**Kerys
Wittton**

**Cathy
Batchelar**

SUNSHINE !

Guidance Documents

Solar Parks: Maximising Environmental benefits

Common with other forms of renewable and low carbon energy, solar parks are a key part of the UK's energy future. This information provides advice relating to solar parks, their siting, their design requirements for the safeguarding of the natural environment and there may be for financial support through environmental grants. It is to help developers and landowners consider the environmental benefits of a solar park whilst avoiding environmental features. If you would like to discuss your proposals with Natural England, please contact them at the earliest opportunity.

Installations of multiple solar panels, usually mounted 1.5-2m high, on greenfield or brownfield land in 2 and 15 hectares. Based on current installations, this note will be updated as circumstances develop. It should be written as and when it becomes available.



German solar farm with shade

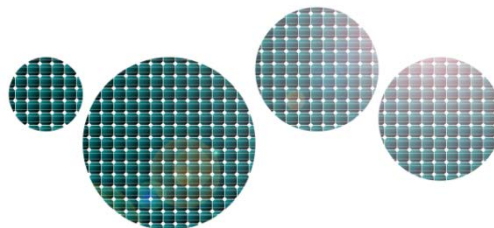
Development, solar parks have the potential to enhance the landscape, natural environment and archaeological and archaeological features. Impacts are being erected or installed close to one another. Solar parks may not have environmental impacts, but they can provide environmental benefits to the local community.

Our specialists should be able to provide advice on what to do. To date (June 2011), England has recommended all onshore energy schemes to be 100% of those offshore. So progress smoothly share some characteristics, including end of life. Natural England will be before consultation phase required.

Need planning permission. For more information, please contact your local council. If you are considering a solar park, you can avoid any costs by discussing

11
October 2011
www.norfolk.gov.uk

Renewable Energy Planning Guidance Note 2



The development of large scale (>50kW) solar PV arrays



MEETING EUROPE'S RENEWABLE ENERGY TARGETS IN HARMONY WITH NATURE

bre

www.bre.co.uk

Planning guidance for the development of large scale ground mounted solar PV systems



BRE NATIONAL SOLAR CENTRE

Department for Communities and Local Government

Planning practice guidance for renewable and low carbon energy

• Direct Impacts

– Habitat loss

- Least productive land for agriculture (Grade 3b or above, paragraph 112 of NPPF) may be better in nature conservation terms
- Loss of habitat for rare arable weeds and invertebrates

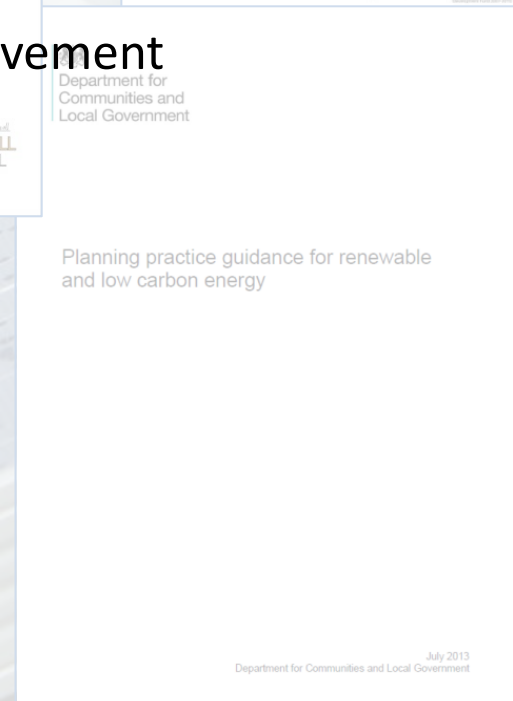
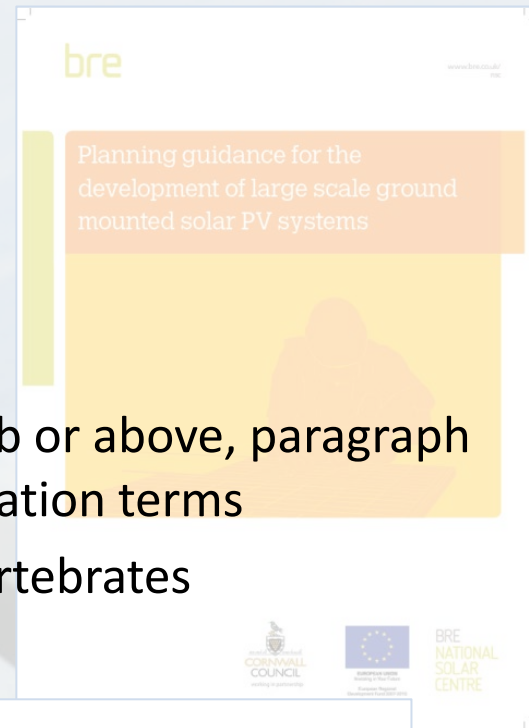
– Fragmentation

- Security fencing acting as a barrier to movement

– displacement of species

• Indirect Impacts

– Land-use change

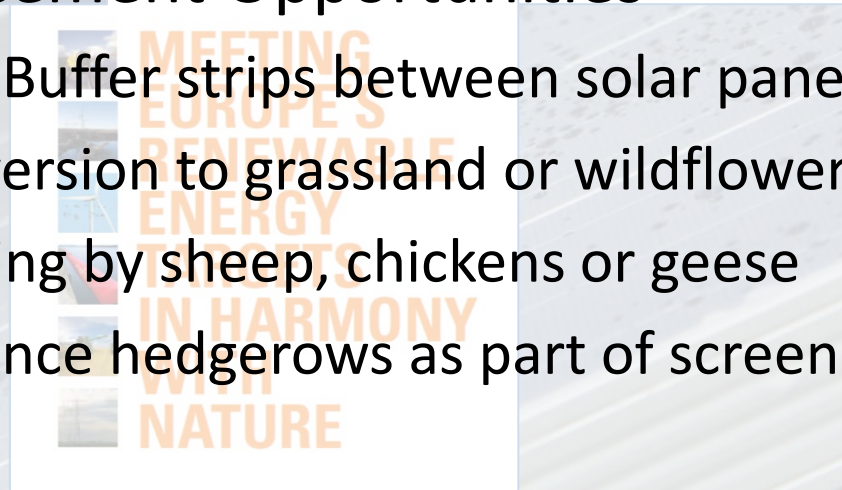
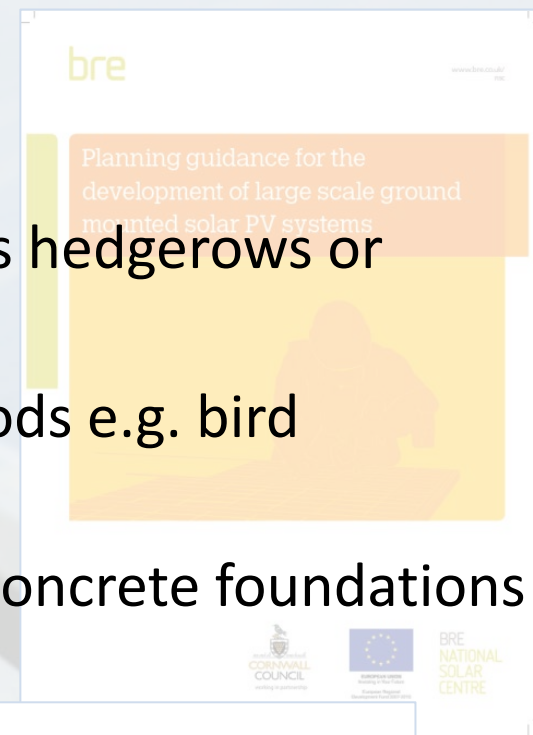
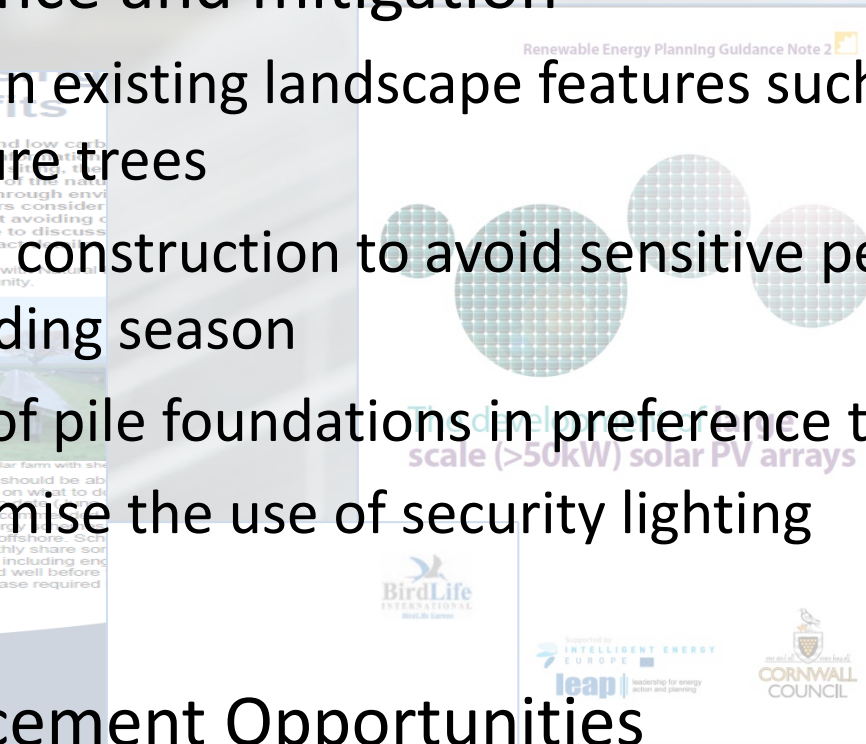
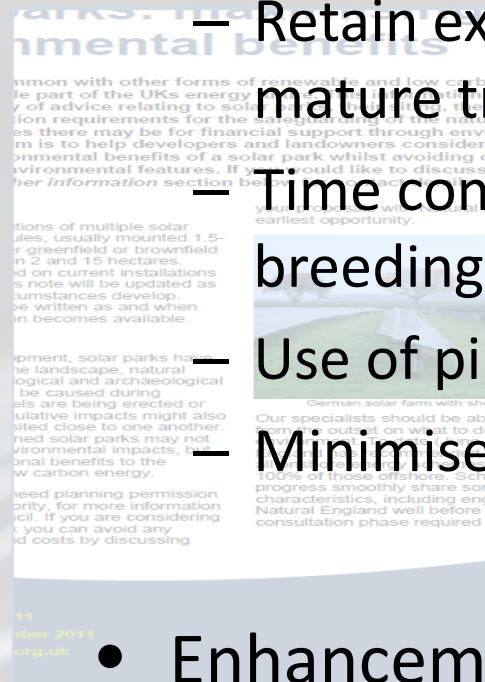


• Avoidance and mitigation

- Retain existing landscape features such as hedgerows or mature trees
- Time construction to avoid sensitive periods e.g. bird breeding season
- Use of pile foundations in preference to concrete foundations
- Minimise the use of security lighting

• Enhancement Opportunities

- >5m Buffer strips between solar panels and hedges
- Conversion to grassland or wildflower rich meadows
- Grazing by sheep, chickens or geese
- Enhance hedgerows as part of screening



EIA Screening for large scale solar arrays

- Not listed under Schedule 2 of the Regulations
- Could have a likely significant effect on the environment
- Proposal should be assessed against the selection criteria identified in Schedule 3 of the Regulations
 - Characteristics of the development
 - Location of the development
 - Characteristics of the potential impact

EIA Screening Opinion Requests – not taken forward to full application (to date)

Reference	Location	Size (Ha)	Output (MW)
DE21/11/0039	Stody Estate	20	5
DE21/12/0125	Extension to Carlton Farm, North Walsham	21	6
DE21/12/0229	Extension to Carlton Farm, North Walsham	5	4
DE21/12/0236	Norwich Road, North Walsham	25	7
DE21/12/0237	Worstead Farm, North Walsham	15	9
DE21/12/0230	Horning Road, Hoveton	28	10
DE21/12/0235	Grange Farm, Hoveton	17	4
DE21/12/0268	Mill Lane, Plumstead	35	12
DE21/12/0275	Stody Estate	31	11
DE21/12/0276	Sandy Hills, North Walsham	11	5
DE21/13/0042	Foulsham Airfield	6	4
DE21/13/0074	Becketts Farm, Hempstead	25	15
DE21/13/0106	Reepham Road, Briston	15	7
DE21/13/0162	Top Farm, Great Snoring	15	7
	TOTAL	269	79



Scheme	Submission Date	Planning Reference	Area of proposal (Ha)	Size of Output (MW)	Planning Permission Granted	Operational status
Carlton Farm, Worstead, North Walsham	March 2011	PF/11/0418	16	5	Yes – 24 th May 2011	Operational
Manor Farm, Crossdale Street, Northrepps	July 2012	PF/12/0816	26	10	Yes – 15 th November 2012	Under Construction
North Creake Airfield, Egmere, Walsingham	February 2013	PF/13/0168	42	20	Yes – 21 st March 2013	Under Construction
Hall Farm, East Beckham	June 2013	PF/13/0772	25	10	Yes – 23 rd September 2013	Preparing for Construction
Pond Farm, Bodham	August 2013	PF/13/0960	8	3.6	Pending	-
Former Airfield, West Raynham, Fakenham	October 2013	PF/13/1166	96	49.9	Pending	-
		TOTAL	213	98.5		

Scheme	Submission Date	Planning Reference	Area of proposal (Ha)	Size of Output (MW)	Planning Permission Granted
Scottow Road, Scottow	November 2012	PF/12/1094	31	13	Withdrawn
Strawberry Lane, Saxthorpe	November 2012	PF/12/1113	14	6	Withdrawn
Belaugh Road, Hoveton (partly within Broadland DC)	November 2012	PF/12/1142	8	12	Withdrawn
		TOTAL	53	31	

Carlton Farm, Worstead

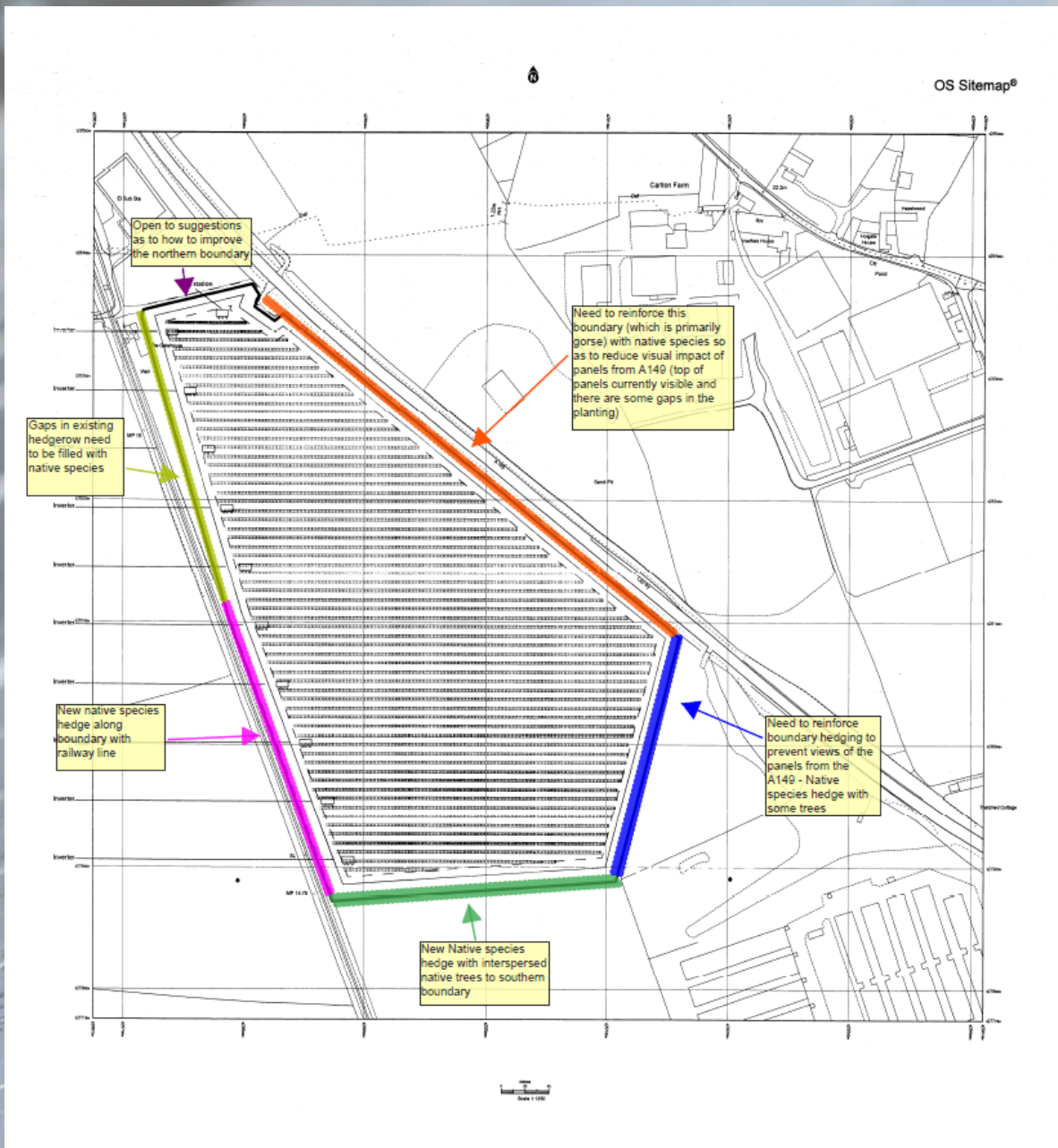




- 16Ha
- 5MW
- Single intensively cropped arable field
- Poor field boundaries
- Adjacent to railway
- Potential scope for ecological enhancements



- No Ecological Report or LVIA
- Basic landscaping plan
- Very basic ecological and landscape enhancements proposed







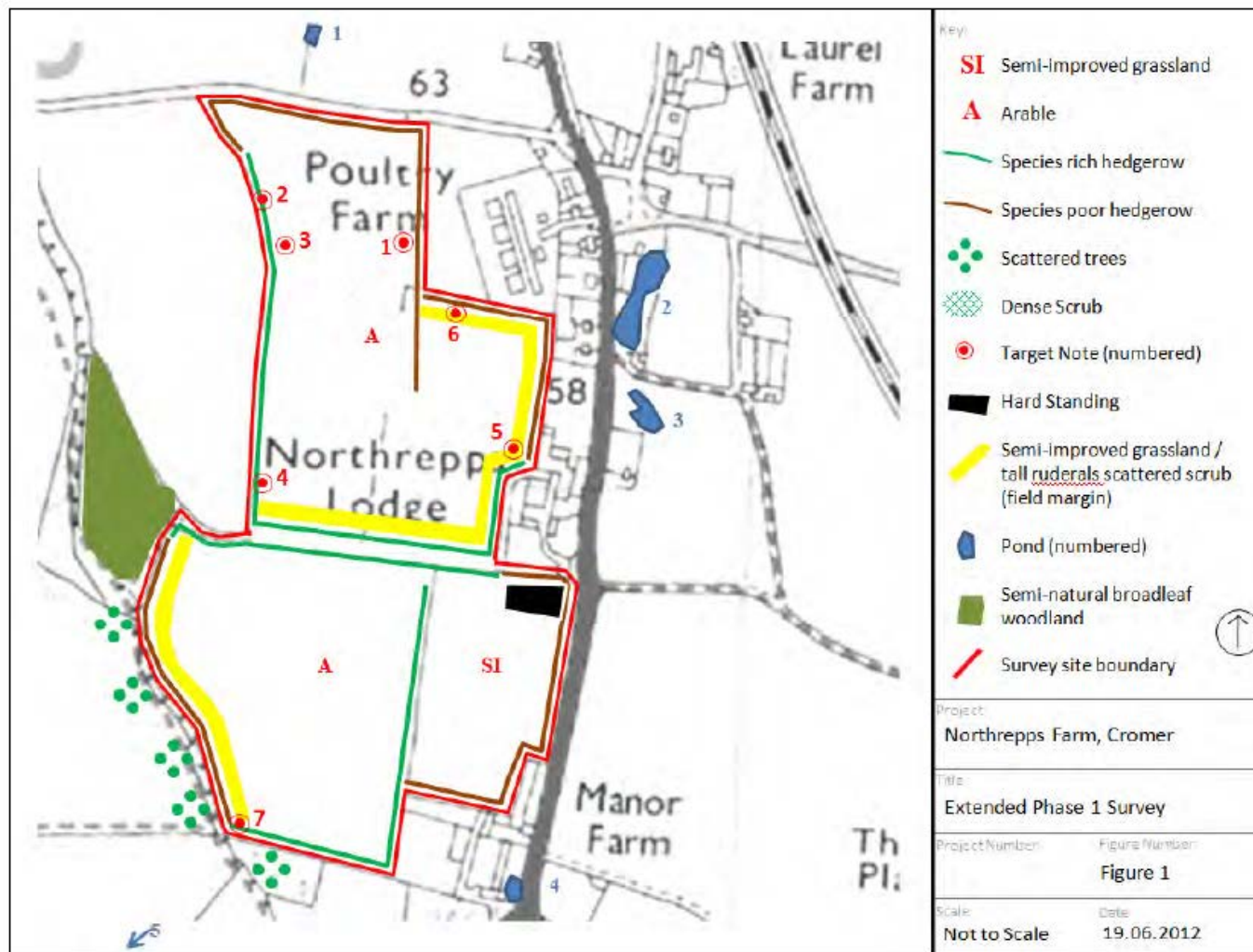
Manor Farm, Crossdale Street Northrepps

- Comprises 3 former agricultural fields
- 26 Hectares
- Will generate approximately 11MW of electricity
- In the Norfolk Coast AONB
- Adjacent to A140 – main tourist route into Cromer



Phase 1 Habitat Map

APPENDIX A: PHASE 1 HABITAT MAP AND TARGET NOTES



Semi-improved grassland

Species Rich hedgerows

semi-natural broadleaf woodland

Some oak trees identified as potential bat roosts

Skylarks/Hares

Recommended ecological buffer zone of 6 metres

Arable field with species rich hedgerows



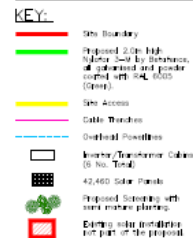
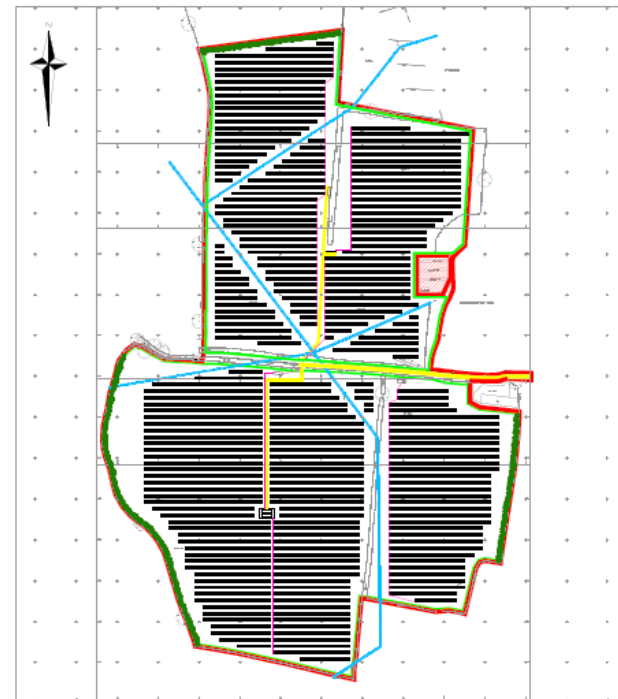
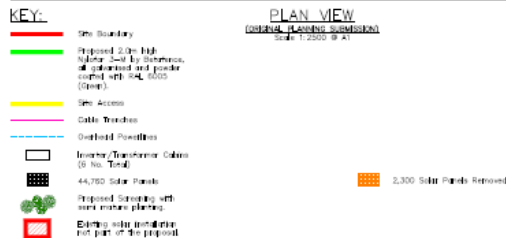
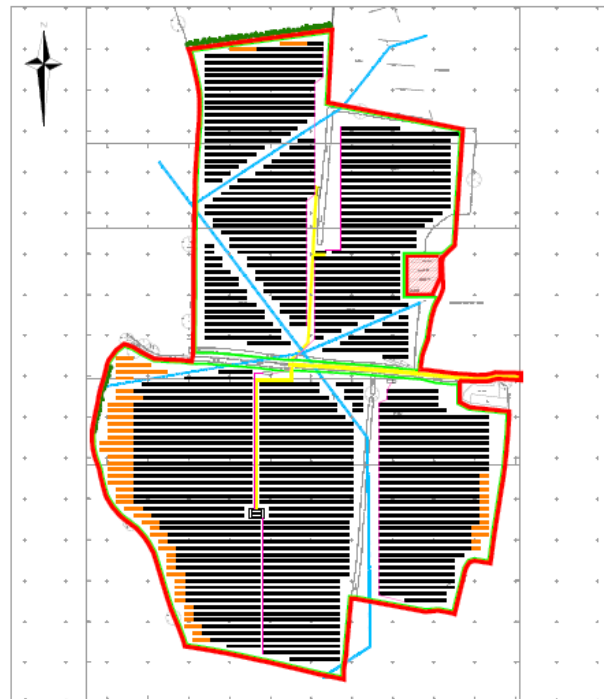
Semi-improved grassland margins



Semi-natural broadleaf woodland



Site Layout: Before and after

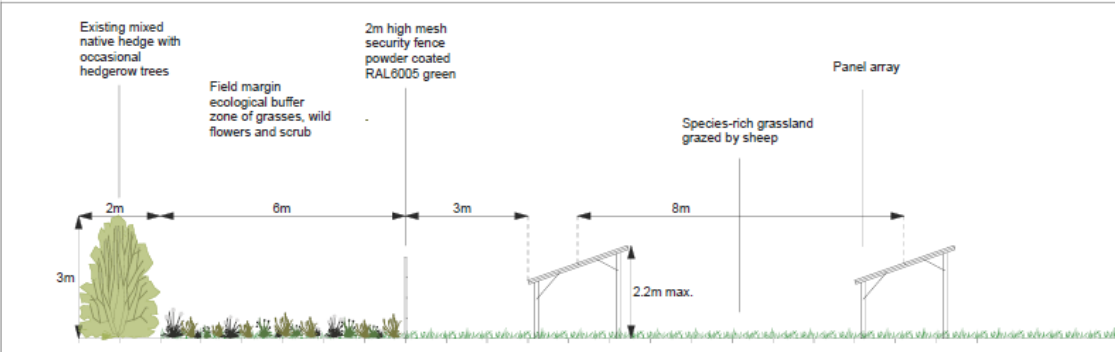


- NOTES:**
1. The Screening is to be installed in accordance with the current Planning Submission & approved plans.
 2. Structures not to be installed.

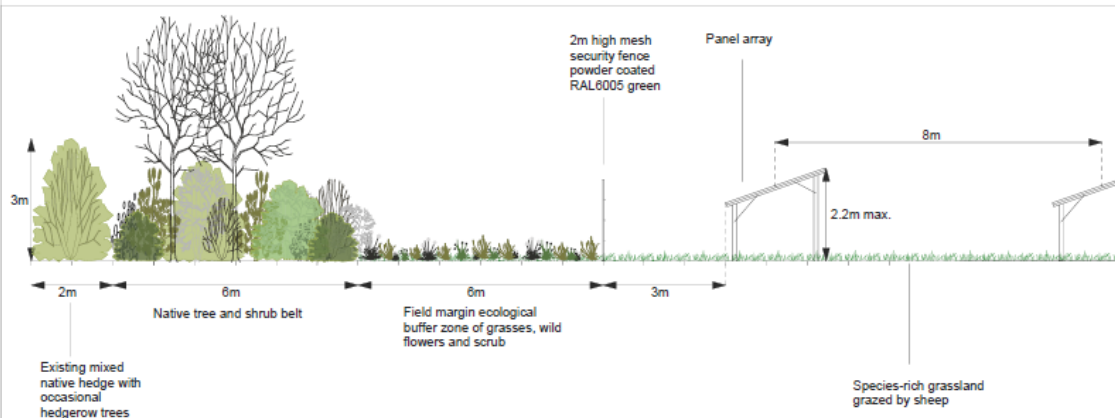
Planning Issue		Date	Rev
Issue	Description	Date	Rev
 <p>Glanville Consultants House 62 Freshfield Road, Dilston Oxen, OX11 7AD Tel: 01235 91656 Fax: 01235 67796 info@glanville.co.uk glanville.co.uk</p>			
Client		Lumidy	
Project		North Norfolk Business Centre Crossade Street, Northwold, Norfolk, NR27 9LF	
Title		Solar Compound Site Layout Comparison	
Project Engineer	S. Borge	Scale	As Shown @ A1
Project Designer	S. Borge	Date	June 2012
Status		PLANNING	
Drawing No.		BS8120561_03	Rev P4

Cross Sections for boundary planting

Section A-A



Section B-B



Client: Lumicity

Manor Farm Solar Park,
North Norfolk Business Centre, Northrepps

Figure 5
Cross Section of Site Boundaries
showing ecological buffer zones

Key

For location of sections see Planting Plan Figure 4
(drawing no. BRS.4011.005. Rev A)

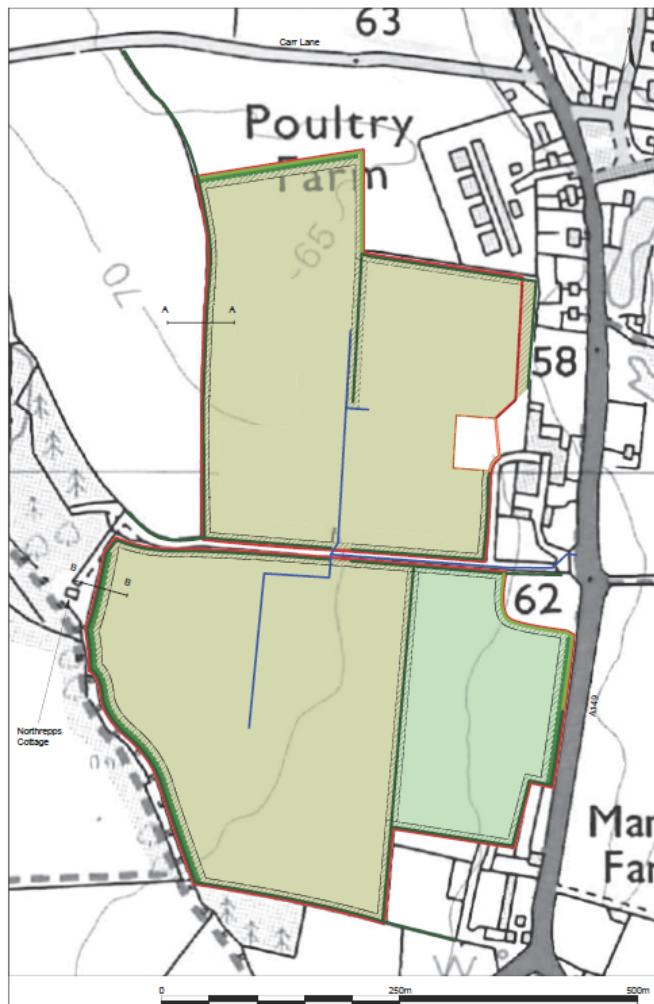
Scale: 1:100 at A3

Drawn by: SE Checked by: JB

Date: 02.11.2012

BRS.4011.006

Planting Plan



SPECIES-RICH GRASSLAND MIX (ARABLE REVERSION)

Ground Preparation

Prior to construction of solar panels, remove 15cm depth of top soil from arable fields to reduce fertility, retaining existing native field margin vegetation. Clearance to take place between September and February, outside of the breeding season for ground nesting birds.

Following construction of solar panels and immediately prior to seeding, if necessary treat any unwanted vegetation regrowth within the fields with a glyphosate based herbicide and allow a suitable period as recommended by the manufacturer for this to take effect. Take care not to treat retained field margin vegetation. Harrow and roll the ground to create a good tilth for seeding.

Planting

Seeding to be carried out in early autumn (ideally) or early spring. Seed to be broadcast by machine then rolled, or broadcast by hand and trodden in, to ensure good contact with the soil.

Seeds to be native British grasses and wildflowers reflecting local established vegetation. For example, Emorsgate Seeds EMG Special General Purpose Meadow Mature or similar, containing:

Name	Species	%
Crested Dogtail	<i>Cynosurus cristatus</i>	40
Slender Creeping Red Fescue	<i>Festuca rubra</i>	28
Common Bent	<i>Agrostis capillaris</i>	8
Smaller Cat's-tail	<i>Phleum bertolonii</i>	4
Meadow Buttercup	<i>Ranunculus acris</i>	2.5
Greater Knotweed	<i>Centaurea scabiosa</i>	1.8
Salted Burnet	<i>Poterium sanguisorba</i>	1.5
Bladder Campion	<i>Silene vulgaris</i>	1.5
Lady's Bedstraw	<i>Galium verum</i>	1
Field Scabious	<i>Knautia arvensis</i>	1
Cowslip	<i>Leucanthemum vulgare</i>	1
Selfheal	<i>Primula veris</i>	1
Yellow Buttercup	<i>Prunella vulgaris</i>	1
Yellow Rattle	<i>Ranunculus bulbosus</i>	1
Red Campion	<i>Rhinanthus minor</i>	1
Tufted Vetch	<i>Silene dioica</i>	1
Wild Carrot	<i>Vicia cracca</i>	0.6
Yarrow	<i>Oxycoccus cantia</i>	0.6
Common Knotweed	<i>Achillea millefolium</i>	0.5
Hedge Bedstraw	<i>Centaurea nigra</i>	0.5
Birdfoot Trefoil	<i>Galium album</i>	0.5
Common Sorel	<i>Lotus corniculatus</i>	0.5
Rough Hewit	<i>Rumex acetosa</i>	0.4
Wild Marjoram	<i>Leonodon hispidus</i>	0.3
Hoary Plantain	<i>Origanum vulgare</i>	0.2
	<i>Plantago media</i>	0.2

Sow seed at approximately 40 kg/ha. Northern field is approximately 11 ha. Southwestern field is approximately 10 ha. Approximately 840 kg of seed required in total.

Within 6m ecological buffer zone around the edge of fields, seed mix to be sown within any areas that were formerly under arable cropping and do not have retained native field margin vegetation.

NATIVE HEDGEROW MIX

Name	Species	Root condition	Age	Height (cm)	% mix	Quantity
Hawthorn	<i>Crataegus monogyna</i>	bagged	1+1	40-60	35	684
Blackthorn	<i>Prunus spinosa</i>	bagged	1+1	40-60	20	390
Ash	<i>Fraxinus excelsior</i>	bagged	1+1	40-60	10	195
Field Maple	<i>Acer campestre</i>	bagged	1+1	40-60	10	195
Holly	<i>Ilex aquifolium</i>	bagged	1+1	40-60	10	195
Hazel	<i>Corylus avellana</i>	bagged	1+1	40-60	10	195
English Oak	<i>Quercus robur</i>	bagged	1+1	40-60	5	98
Hawthorn	<i>Crataegus monogyna</i>	bagged	1+1	40-60	NA	100

Species mix reflects local vegetation identified in the ecology survey and follows guidance provided in Planting hedges in Norfolk - maintaining regional character by Norfolk County Council and Norfolk Biodiversity Partnership.

Species should not be randomly mixed, but planted in blocks of up to 10m, particularly for Hazel and Holly.

Plant in a double-staggered row at 500mm centres (i.e. 4 plants per linear metre). Total length of new hedgerow = 488m (1952 plants).

Gaps in existing hedges to be filled with Hawthorn planted in a double staggered row at 500mm centres; 4 per linear metre. Estimate = 25m (100 plants).

Planting to be carried out November to March when deciduous species are dormant. Plants to be firmed in well and protected with mulch mats and rabbit guards.

NATIVE TREE AND SHRUB SCREEN MIX

Name	Species	Root condition	Age	Height (cm)	% mix	Quantity
English Oak	<i>Quercus robur</i>	bagged	1+2	90-120	12	341
Ash	<i>Fraxinus excelsior</i>	bagged	1+1	90-120	12	341
Field Maple	<i>Acer campestre</i>	bagged	1+1	90-120	15	427
Holly	<i>Ilex aquifolium</i>	bagged	1+1	40-60	15	427
Wild Cherry	<i>Prunus avium</i>	bagged	1+1	90-120	10	284
Crab Apple	<i>Malus sylvestris</i>	bagged	1+1	90-120	10	284
Hazel	<i>Corylus avellana</i>	bagged	1+1	40-60	8	228
Hawthorn	<i>Crataegus monogyna</i>	bagged	1+1	40-60	8	228
Dog Rose	<i>Rosa canina</i>	bagged	1+1	40-60	5	142
Gorse	<i>Ulex europaeus</i>	bagged	1+1	40-60	5	142

Trees and shrubs selected for a variety of heights and leaf cover reflecting prevailing native species in the area, as indicated in the ecology survey and Norfolk County Council guidance.

Plant in a 6m wide belt at 1.5m centres. Total length of belt = 711m (2844 plants).

Plant species in groups of 3, 5 or 7.

Plant November to March when deciduous trees are dormant. Take care to keep roots covered at all times. Firm plants in well and protect with mulch mats and tree shelters. Trees to be secured to stakes with proprietary tree ties for the first 3-4 years.

Client: Lumicity

Manor Farm Solar Park,
North Norfolk Business Centre, Northrepps

Figure 4
Planting Plan

Key

- Site Boundary
- Access Route
- Existing Solar Installation
- Proposed Native Mixed Hedge (3m high)
- Existing Hedgerow/Tree Field Boundary (3m high)
- Species-rich Grassland Seed Mix - to revert arable fields to pasture
- Existing Semi-improved Grassland
- Mixed Native Tree and Shrub Screening Belt (6m wide)
- Ungrazed Field Margin Ecological Buffer Zone (6m wide)
- 3m High Security Fence, Powder Coated Green
- 1.2m High Post and Wire Mesh Sheep Fencing - to protect ecological field margins in centre of site

Section A - See drawing BRS.4011.006

Section B - See drawing BRS.4011.006

GENERAL REQUIREMENTS

All plants should conform to BS 3936 and be in accordance with the National Plant Specification. Supplying nurseries shall be registered under the HTA Nurseries Certification Scheme. All plants shall be packed and transported in accordance with the Code of Practice for plant handling as produced by CPSE.

Planting shall not be carried out when the ground is waterlogged, frost bound, during periods of drought or excessive cold drying winds.

Scale: 1:3000 at A2

Drawn by: SE

Checked by: JB

Date: 01.11.2012

BRS.4011.005 Rev A



Fencing and CCTV detail

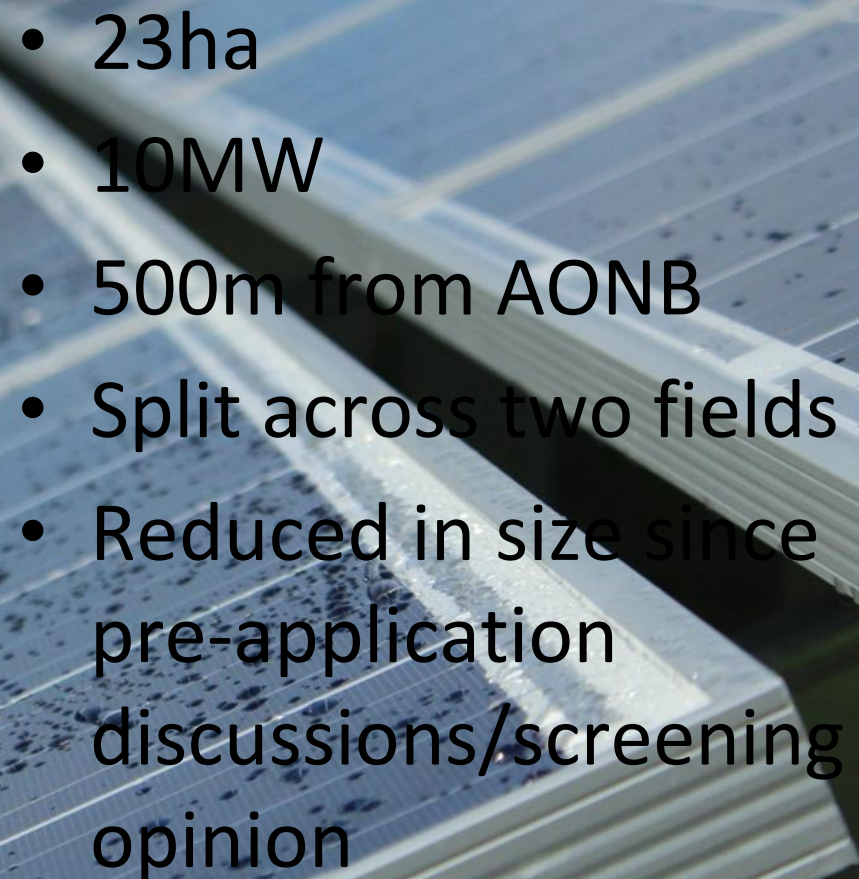


Solar System with cameras mounted every 50 metres along the fence line

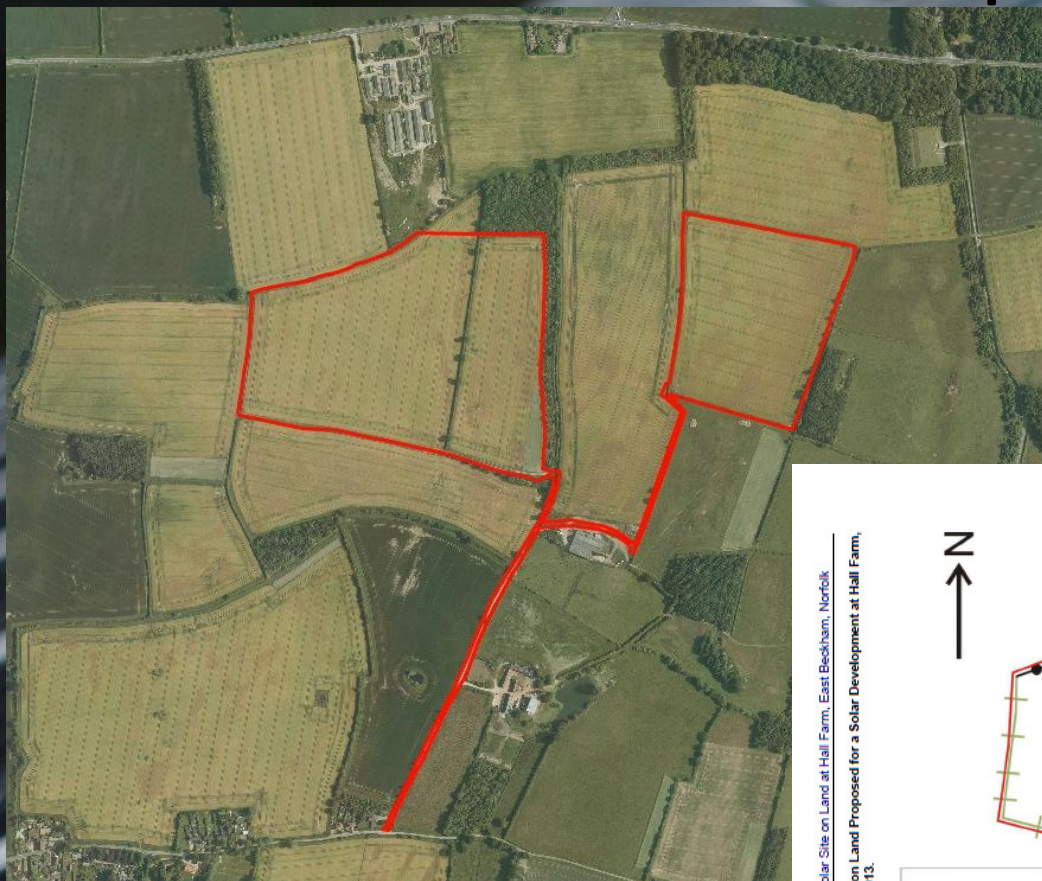


CCTV cameras and detection sensors mounted on separate posts along the fence



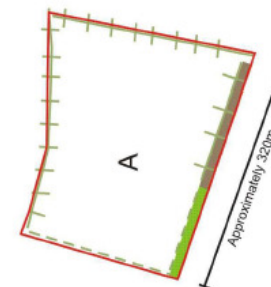
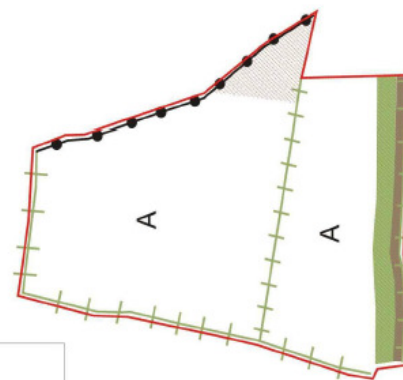


Aerial View and Phase 1 Habitat Map



Ecological Assessment for a Proposed Solar Site on Land at Hall Farm, East Beckham, Norfolk
Figure 2: Phase 1 Habitats and Features on Land Proposed for a Solar Development at Hall Farm, East Beckham, Norfolk, 15th February 2013.

Adonis Ecology Ltd.
 Tel: 01760 247100 Email: info@adonisecology.co.uk
 Title: Figure 2: Phase 1 Habitats and Features on Land Proposed for a Solar Development at Hall Farm, East Beckham, Norfolk, 15th February 2013.
 Survey Date: 15th February 2013
 Version: V2
 Scale: See Below




Key:

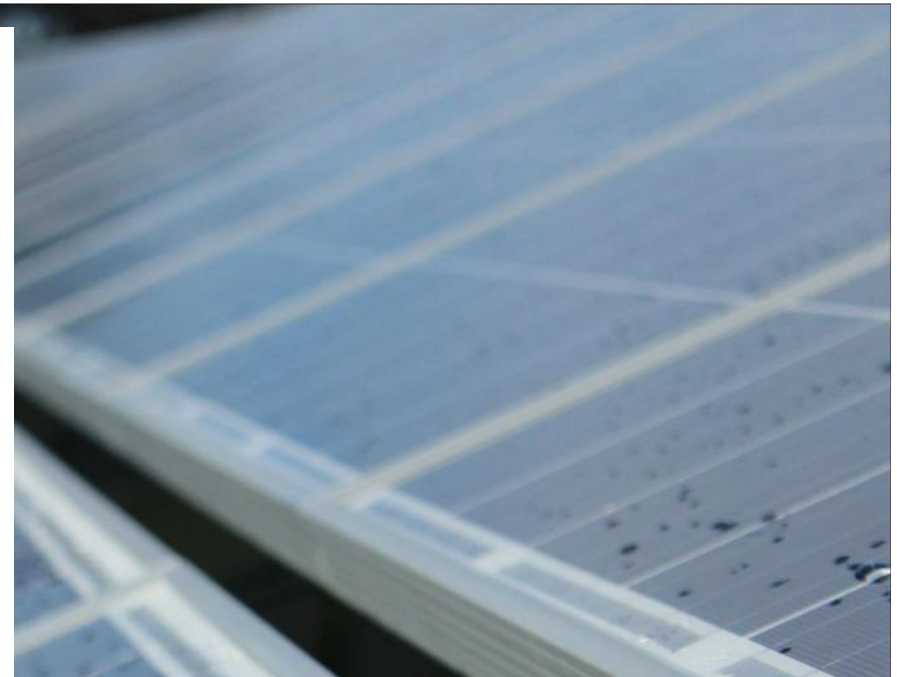
Site Boundaries	Arable	Rough Grassland	Track Recently Created Through Dense Bush	Species-Poor Hedge	Earth Bank	Grassy Track	Mixed Plantation
A							



Project:	PV-108-01 Hall Farm	Viewpoint	Eastng	Northng	Altitude (m)	Distance to nearest point of array (km)	Horizontal field of view (HFOV -°)	120	Height of camera (m)	1.6
Location:	Public Right of Way	05	614662	340398	80	0.010	Correct viewing distance (mm at A3)	200	Date of photograph taken	14/03/2013

Existing View	
Proposed view at Day1	

Registered Office: TGC House, Duckmoor Industrial Estate, Duckmoor Road, Bristol, BS1 2BJ (Company no. 05969030)



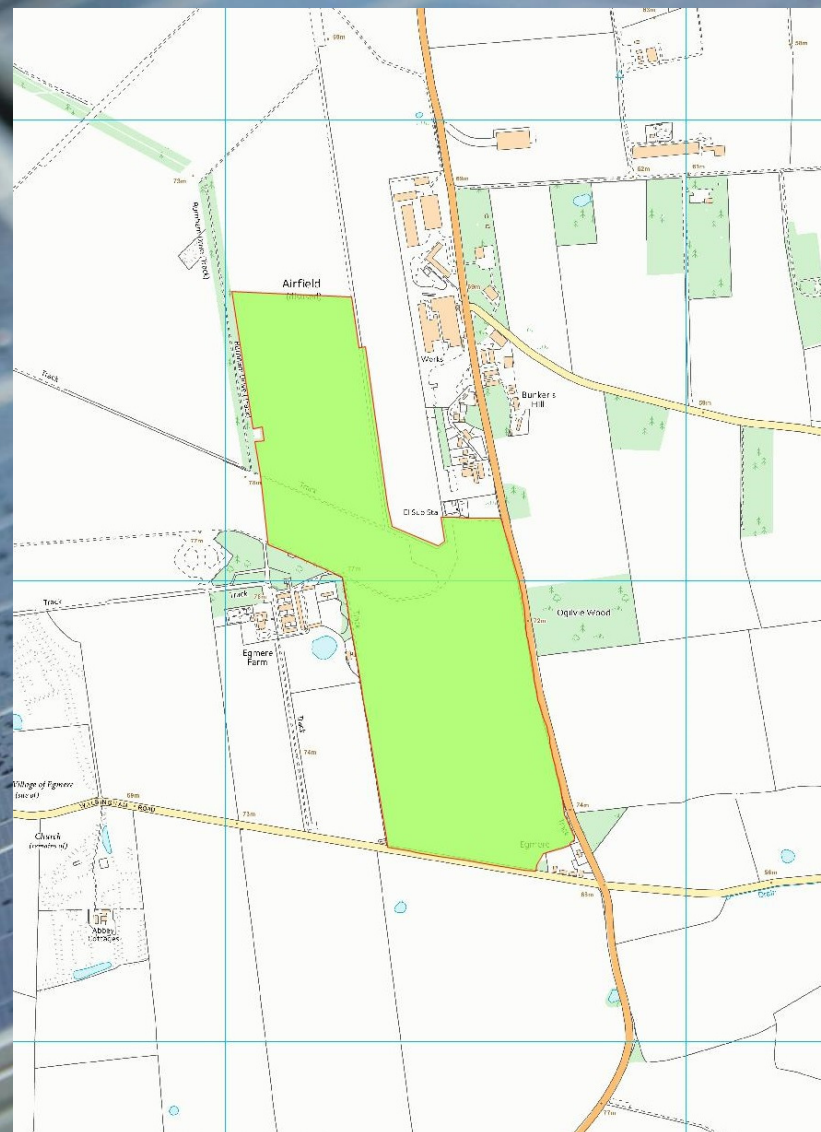
Proposed view at Year2	
Proposed view at Year10	

Registered Office: TGC House, Duckmoor Industrial Estate, Duckmoor Road, Bristol, BS1 2BJ (Company no. 05969030)



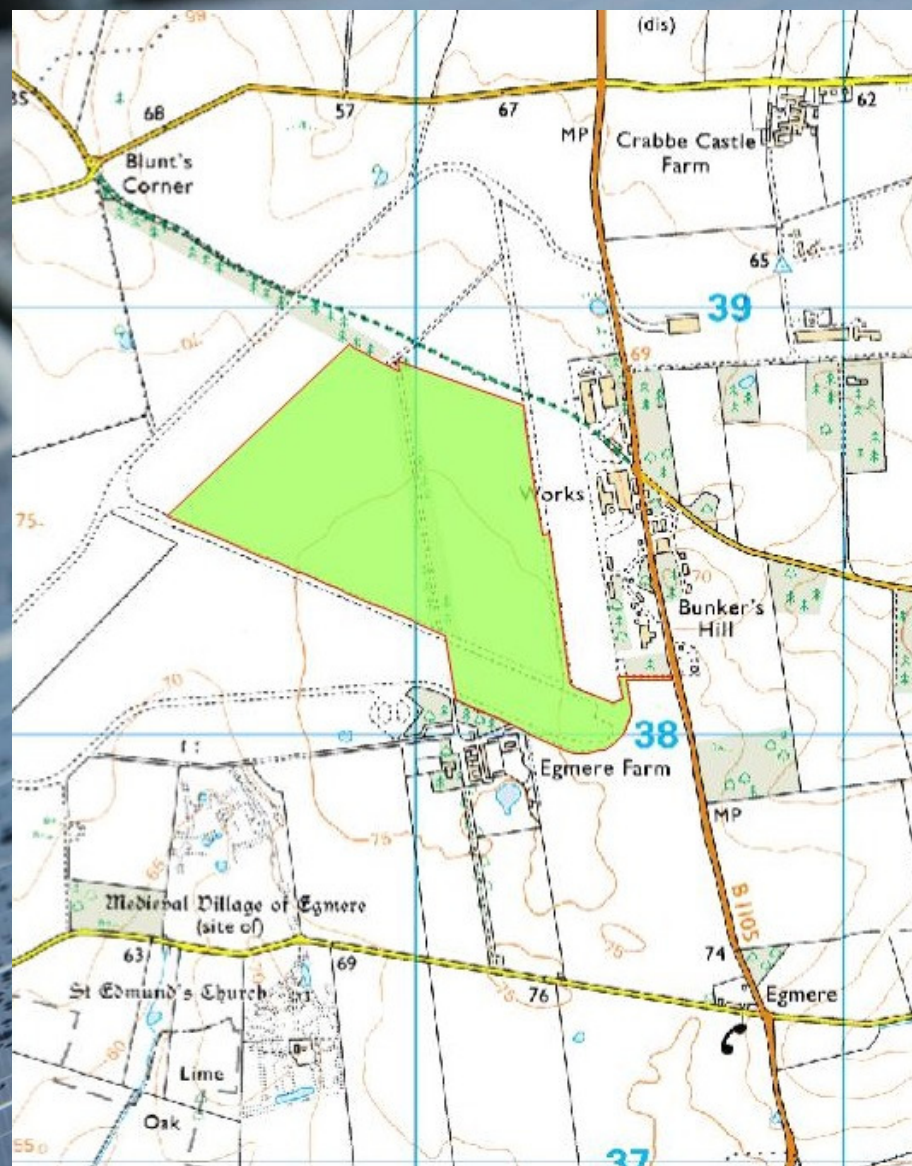
North Creake Airfield, Egmore

Original planning application - withdrawn

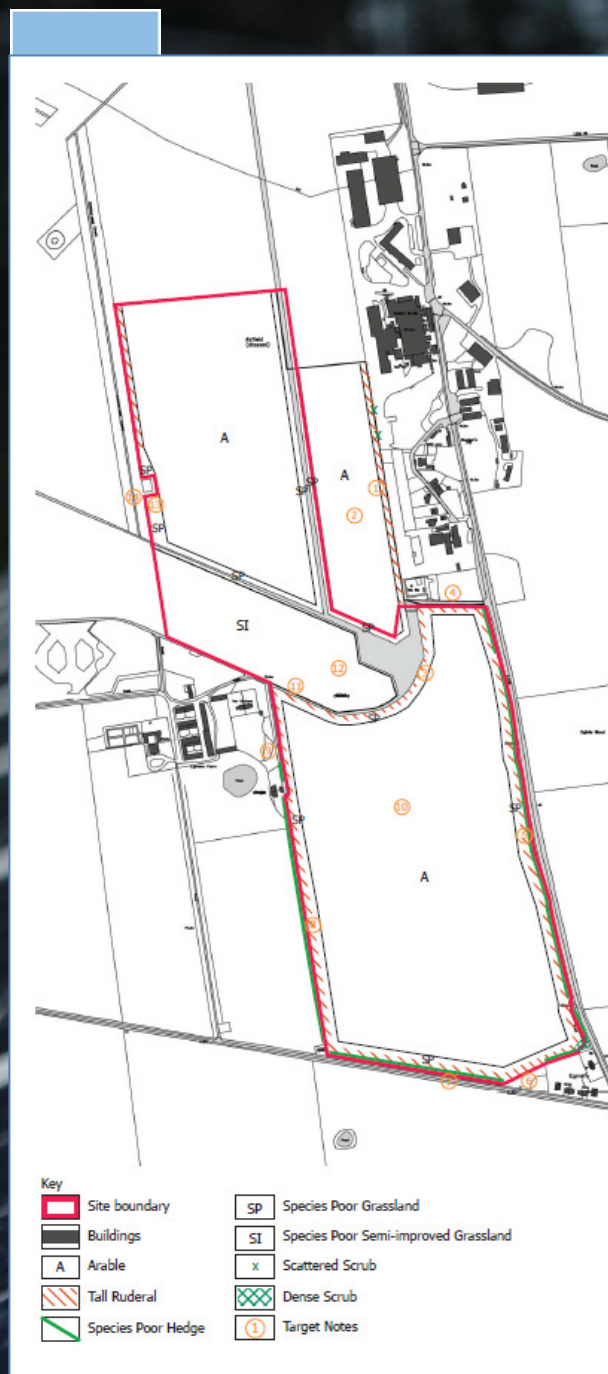




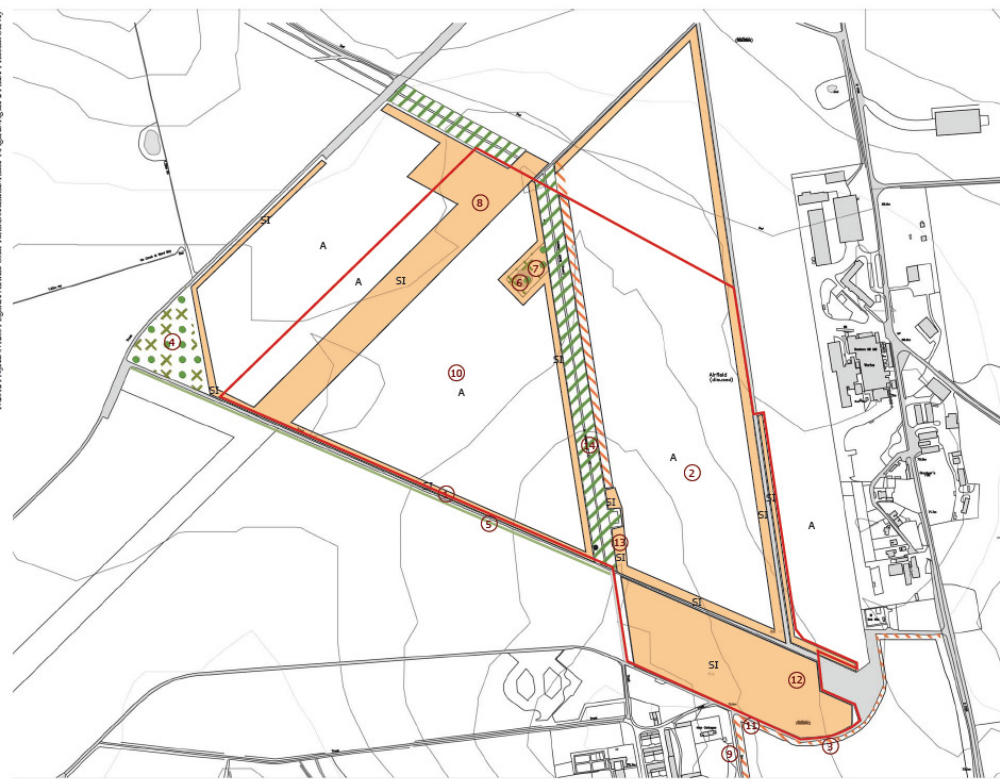
Revised planning application







T:\2012 Projects\N12631 Egmore Airfield Solar Farm\Documents\Phase 1 Habitat Survey



N12631 Egmore Airfield Solar Farm
 Phase 1 habitat survey
 Figure 2
 Scale: 1:5000 @ A3
 February 2013

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thelandscapepartnership

thelandscapepartnership
 planning and designing environments for life

Project: Egmore Airfield Solar Park
 Drawing: Phase 1 Habitat Survey

Dwg No: Figure 2
 Scale: 1:5 000 @ A3
 Date: October 2012
 Drawn: [] Checked: TM

Bedford 01234 261315
 Woodbridge 01394 380509
 London 0207 252 0002
 Norwich 01603 230777

Do not scale off drawings. All dimensions & levels are to be checked on site. Any discrepancies must be reported to the landscape architect immediately.
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Phase 1 Habitat Surveys for both applications





Viewpoint 2a continued.



Viewpoint 2b continued.

N12631 North Creak Airfield,
Egmere, Norfolk
Viewpoint Photographs

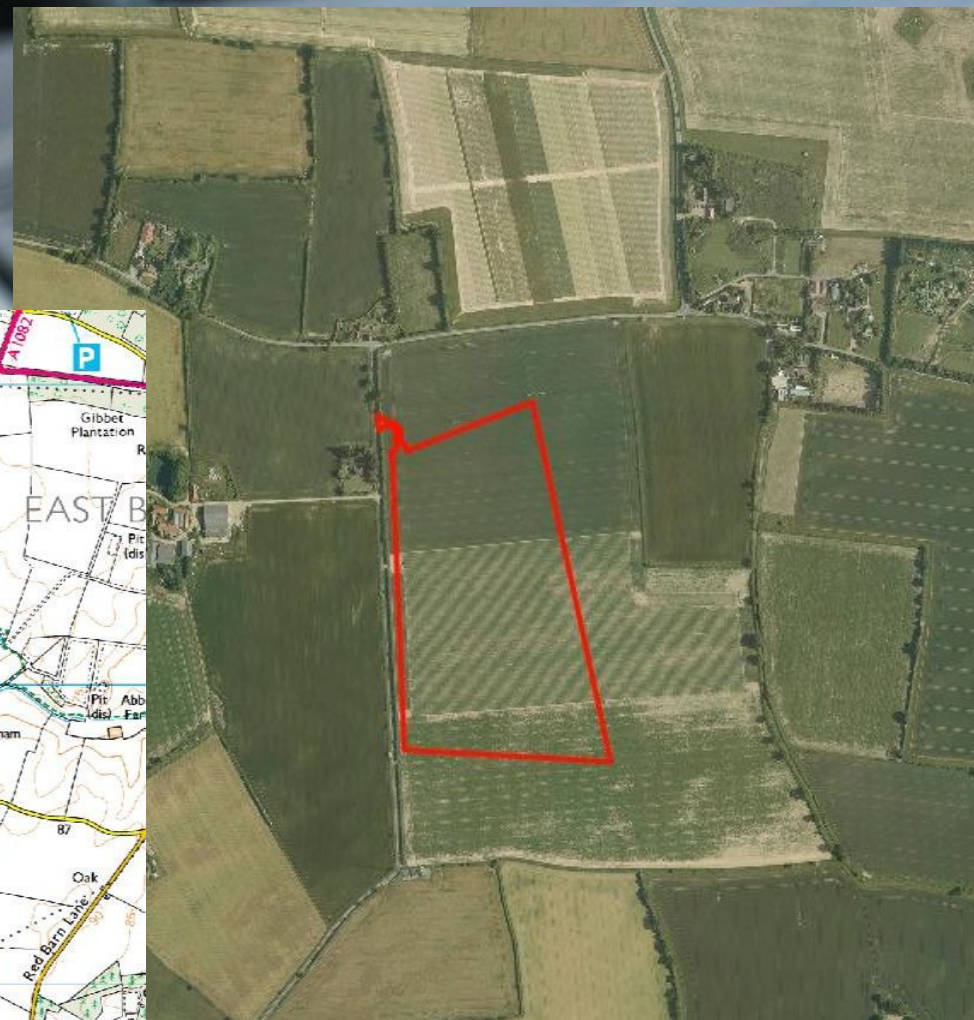
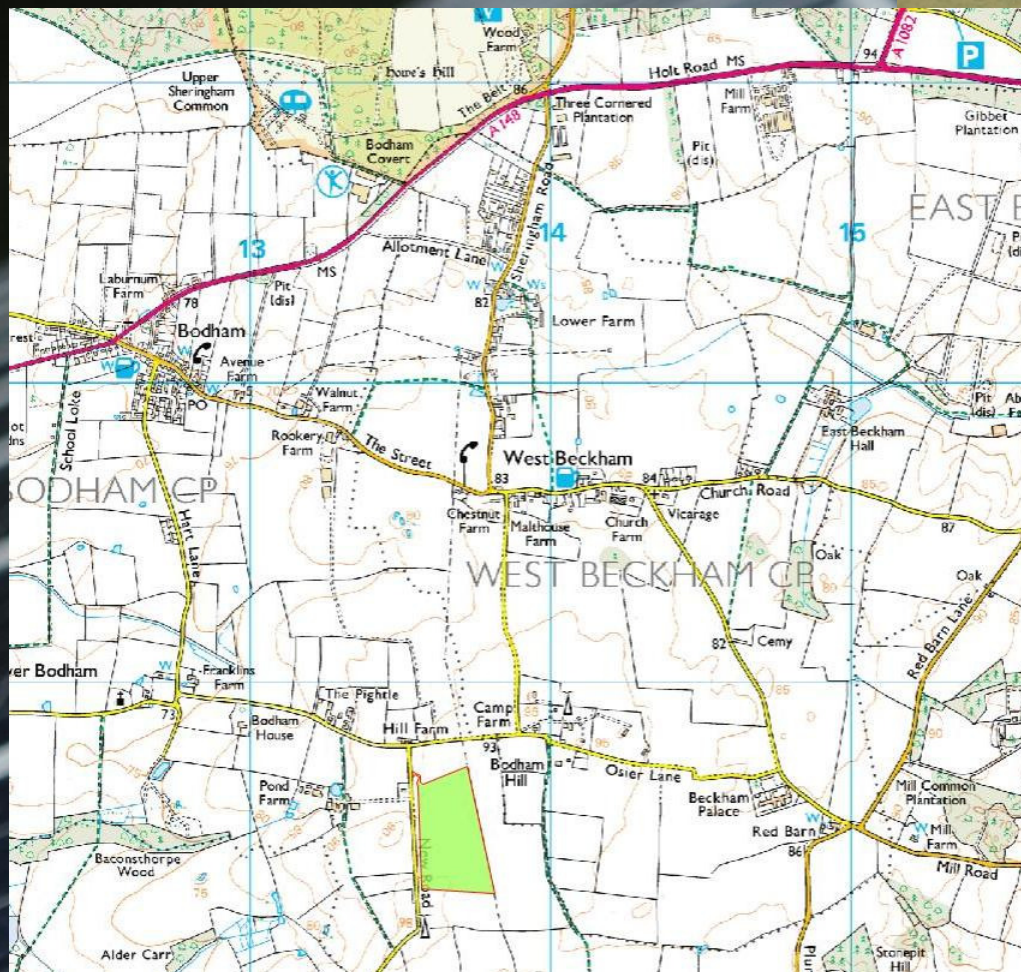
Figure 09

October 2012





Pond Farm, Bodham



- 8 Ha
- 3.6MW
- Land owner applicant

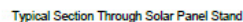
Field of View: 70°



Field of View: 70°



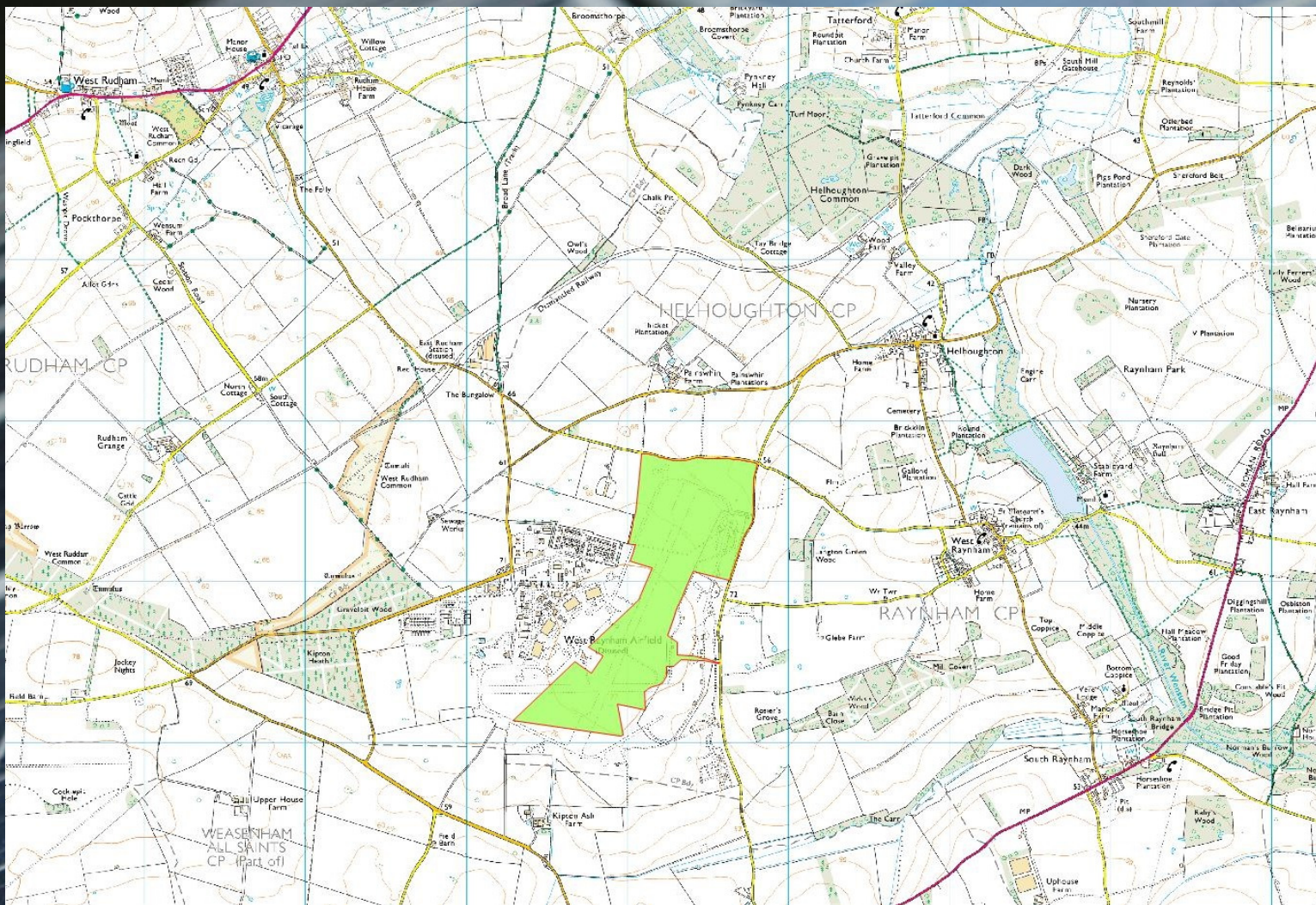






RAF West Raynham

- Current planning application at former RAF base
- Largest site to date







In summary:

- Detailed ecological information to support application
- Lots of negotiation – to secure improvements
- Construction requirements – practicalities
- Aftercare – ownership / responsibility
- Conditions
- Monitoring

To graze or not to graze!

