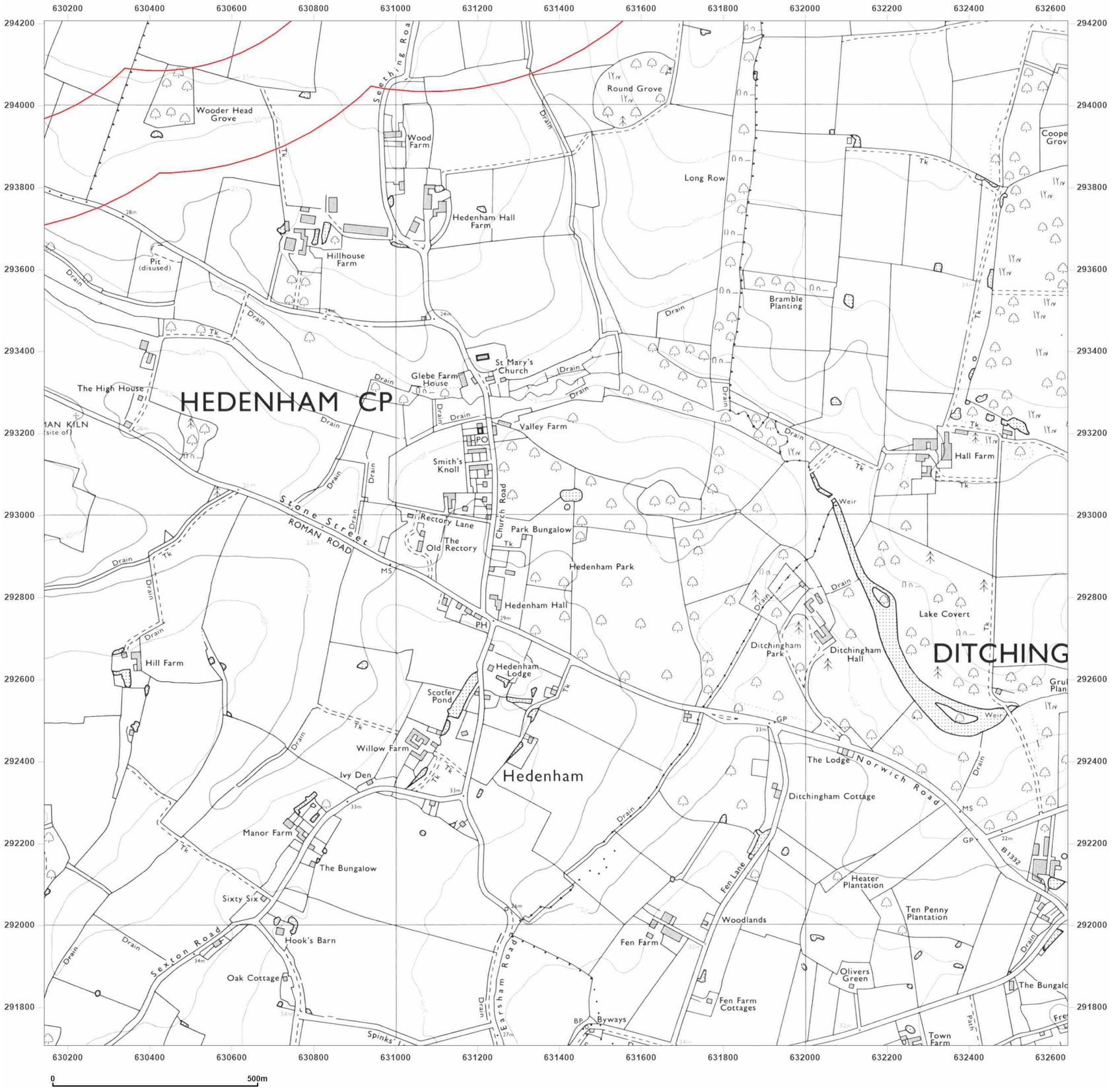

Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_3
Grid Ref: 631391, 292956

Map Name: National Grid

Map date: **1971**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1971
Revised 1971
Edition N/A
Copyright N/A
Levelled N/A

Powered by OS

Produced by
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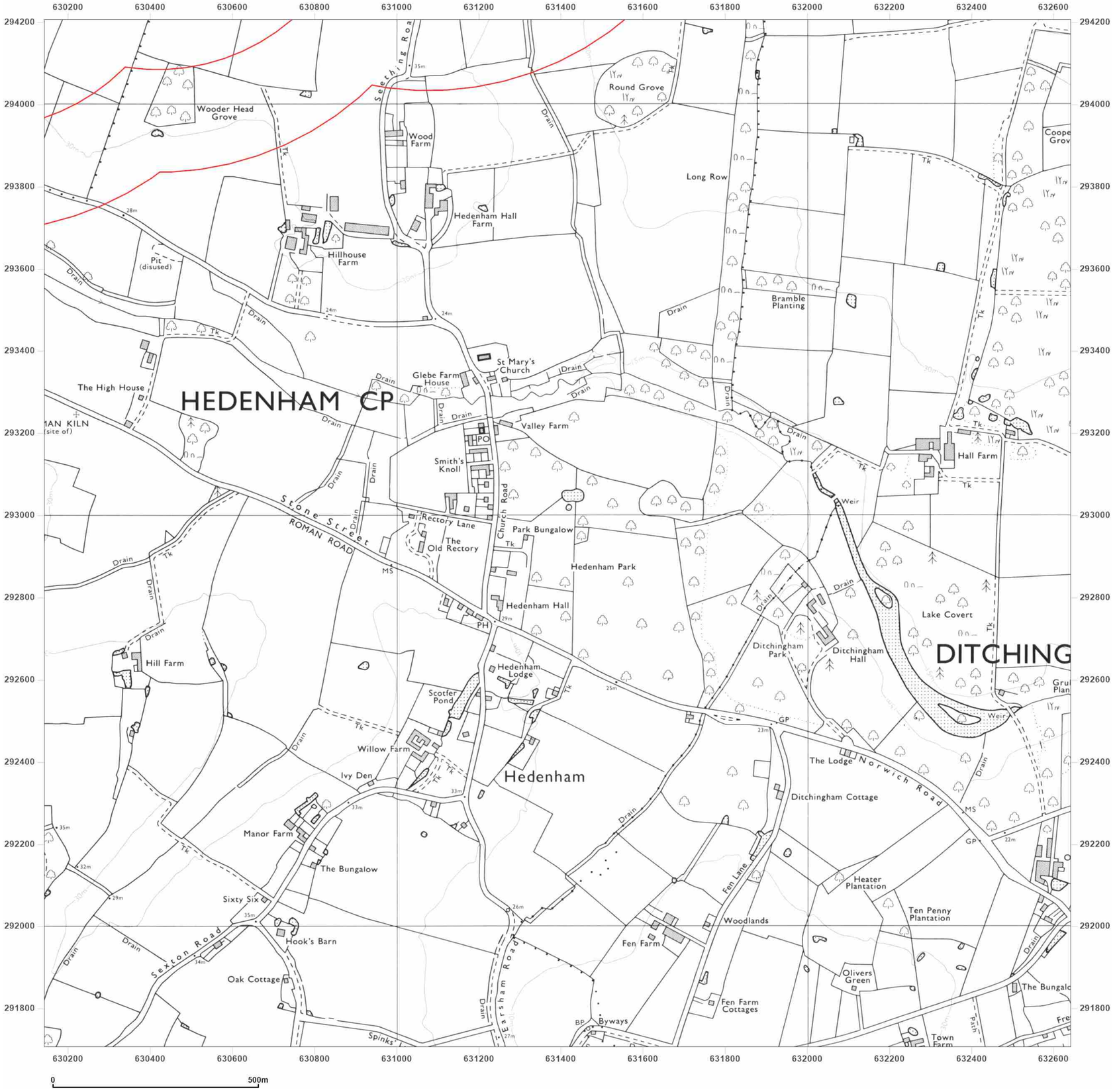
E: info@groundsure.com
W: www.groundsure.com

Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_3
Grid Ref: 631391, 292956

Map Name: National Grid

Map date: **1971**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1971
Revised 1971
Edition N/A
Copyright N/A
Levelled N/A

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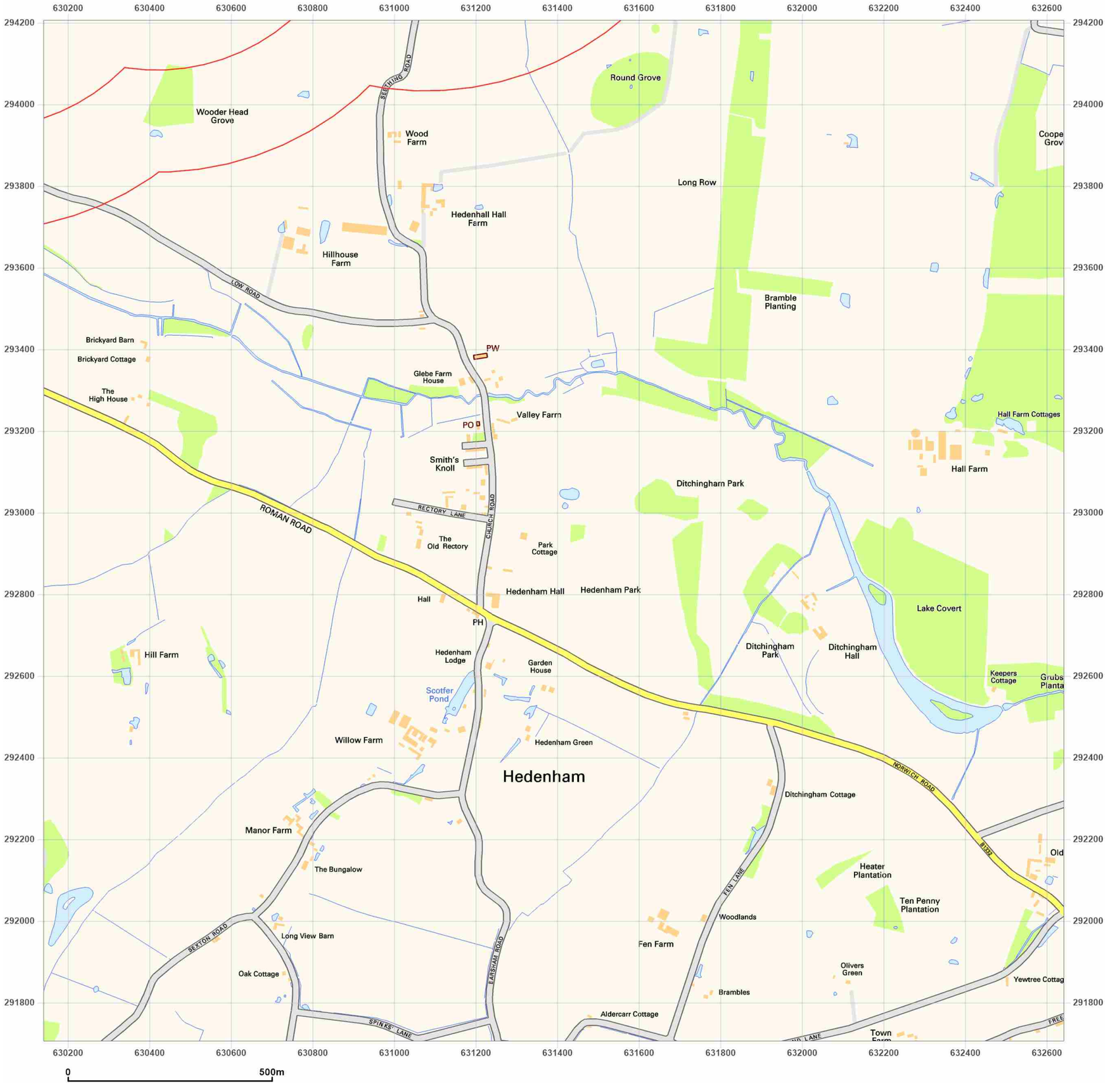
Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_3
Grid Ref: 631391, 292956

Map Name: National Grid
Map date: **2001**
Scale: 1:10,000
Printed at: 1:10,000

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2001

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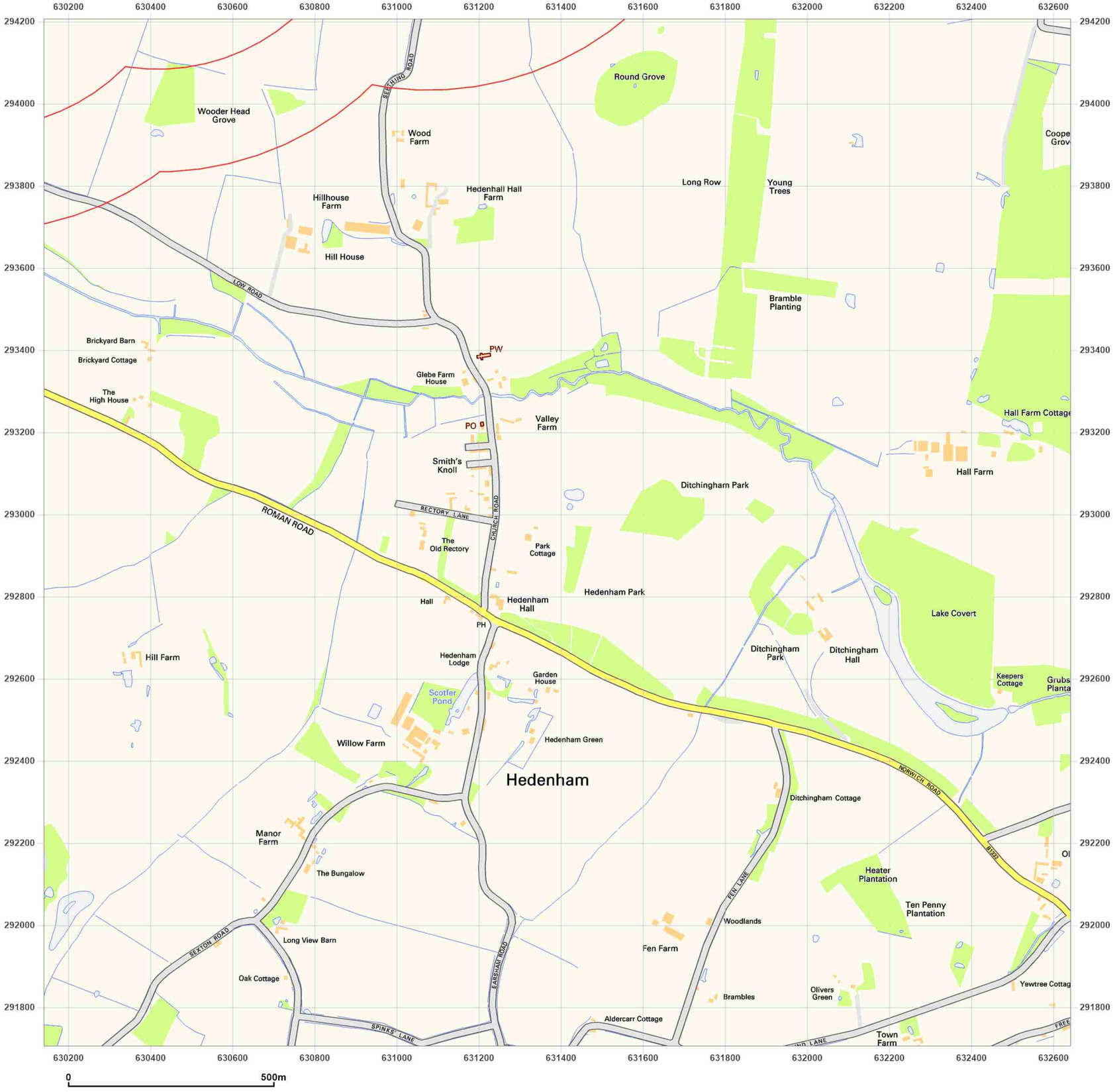
Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_3
Grid Ref: 631391, 292956

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

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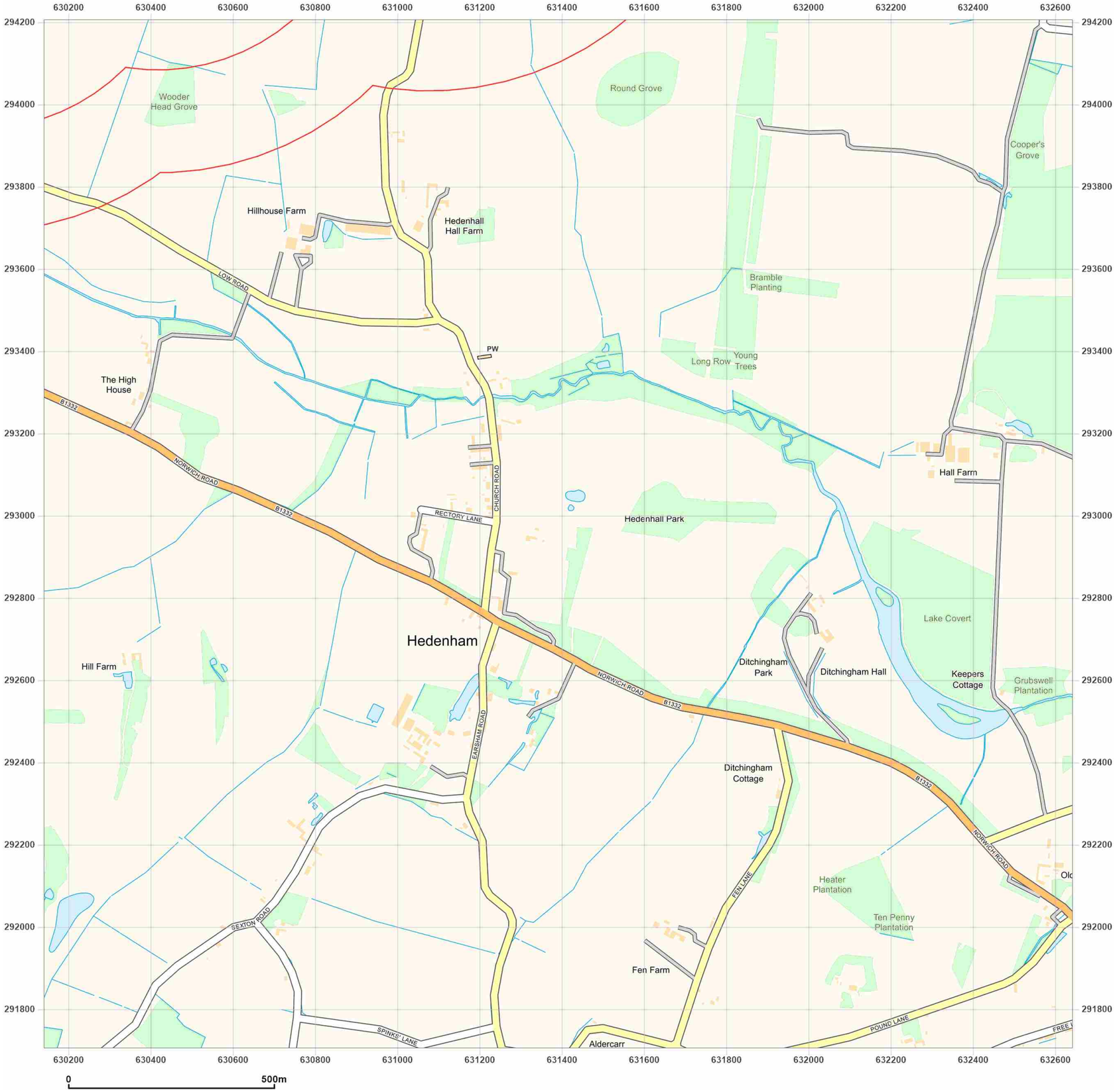
Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_3
Grid Ref: 631391, 292956

Map Name: National Grid

Map date: **2024**

Scale: 1:10,000

Printed at: 1:10,000

N
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2024

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W: www.groundsure.com

Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf

Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: County Series

Map date: **1884**

Scale: 1:10,560

Printed at: 1:10,560

N
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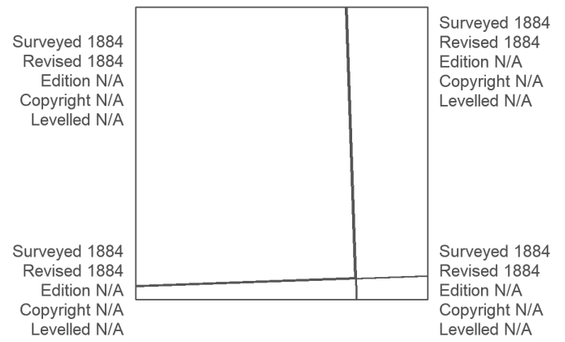

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Production date: 22 August 2024

Map legend available at:
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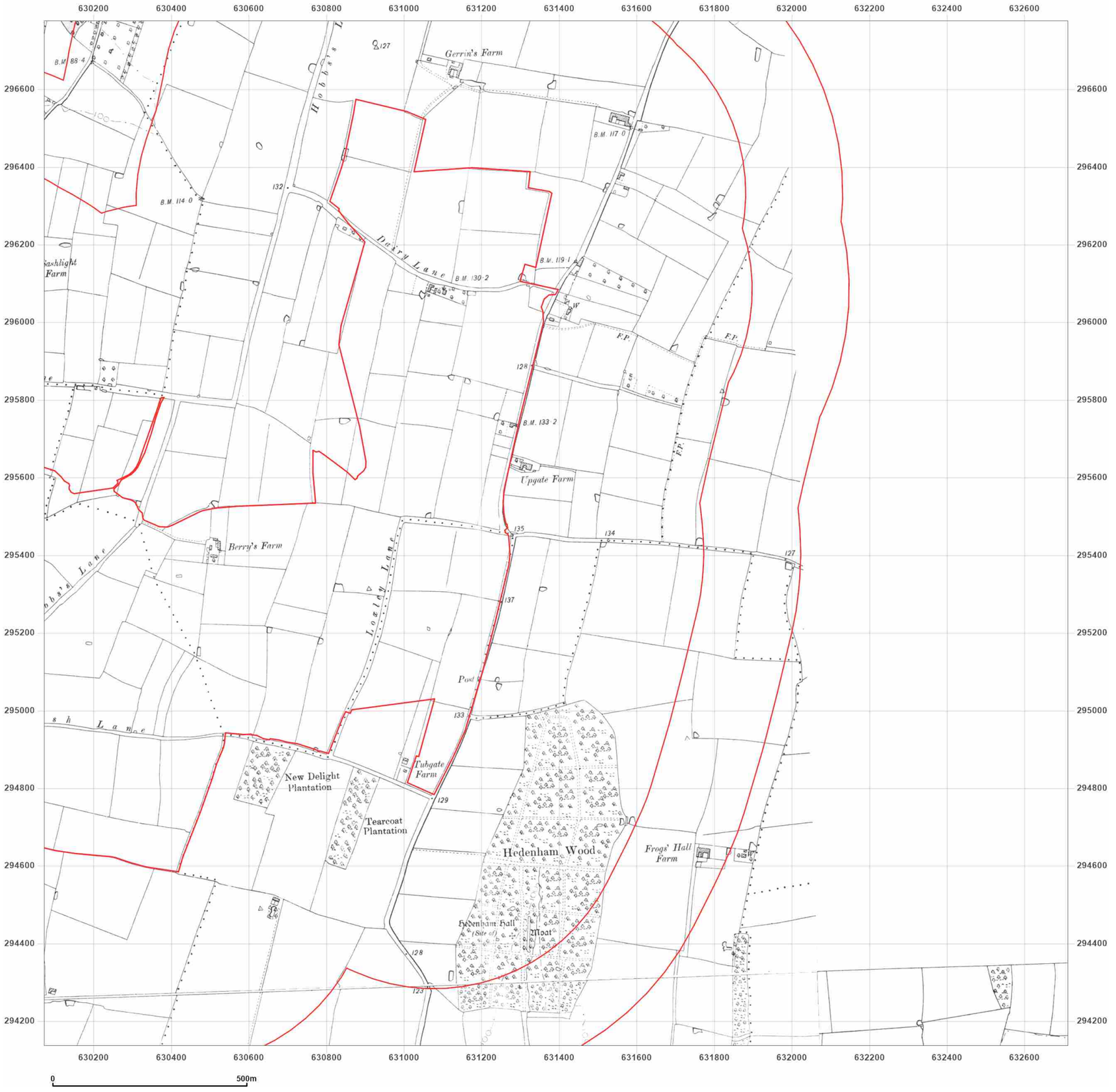

Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: County Series

Map date: **1903-1907**

Scale: 1:10,560

Printed at: 1:10,560

N
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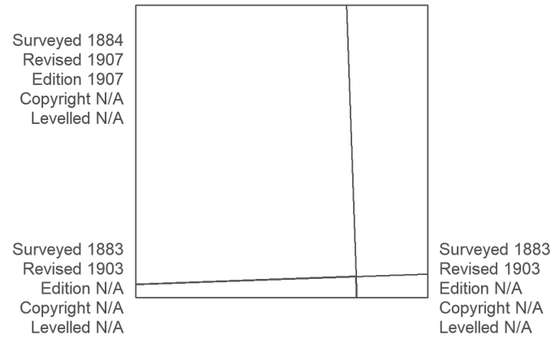

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W: www.groundsure.com

Production date: 22 August 2024

Map legend available at:
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Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: County Series

Map date: **1904-1907**

Scale: 1:10,560

Printed at: 1:10,560

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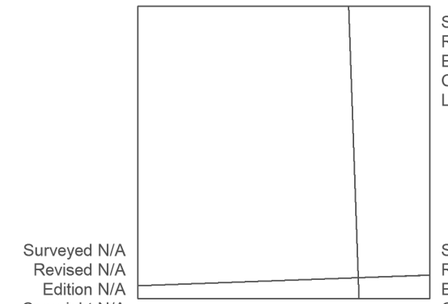

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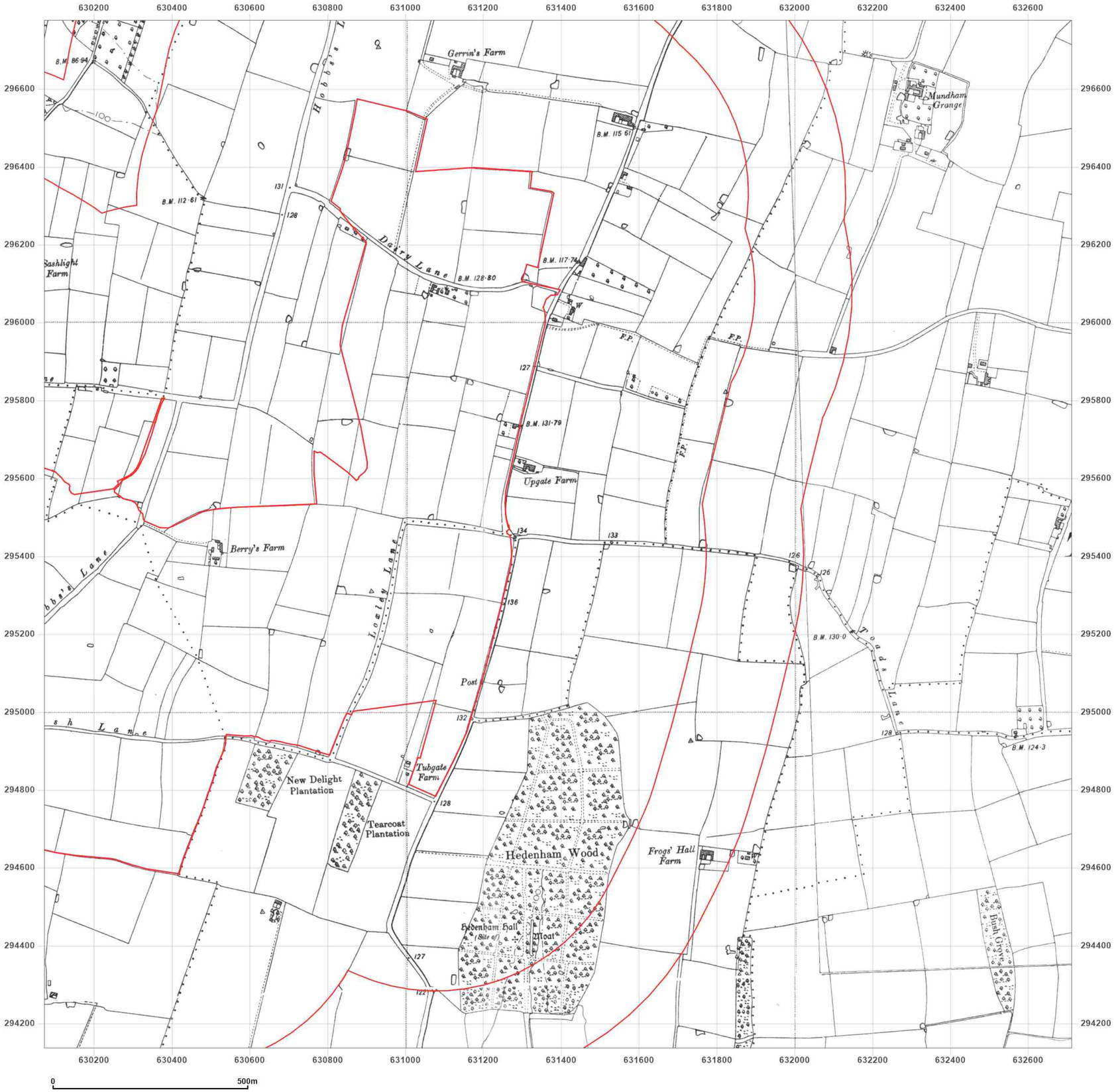
W: www.groundsure.com

Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: County Series

Map date: **1946**

Scale: 1:10,560

Printed at: 1:10,560

N
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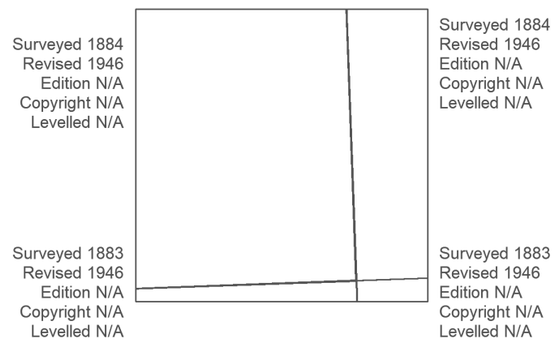

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W: www.groundsure.com

Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf

Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: Provisional

Map date: **1953-1957**

Scale: 1:10,560

Printed at: 1:10,560

N
W E
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Surveyed N/A
Revised 1956
Edition N/A
Copyright 1957
Levelled N/A

Surveyed 1953
Revised 1953
Edition N/A
Copyright N/A
Levelled N/A

Powered by OS

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W: www.groundsure.com

Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf

Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: National Grid

Map date: **1971**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1971
Revised 1971
Edition N/A
Copyright N/A
Levelled N/A

Powered by OS

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Production date: 22 August 2024

Map legend available at:
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Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: National Grid

Map date: **1971**

Scale: 1:10,000

Printed at: 1:10,000

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Surveyed 1971
Revised 1971
Edition N/A
Copyright N/A
Levelled N/A

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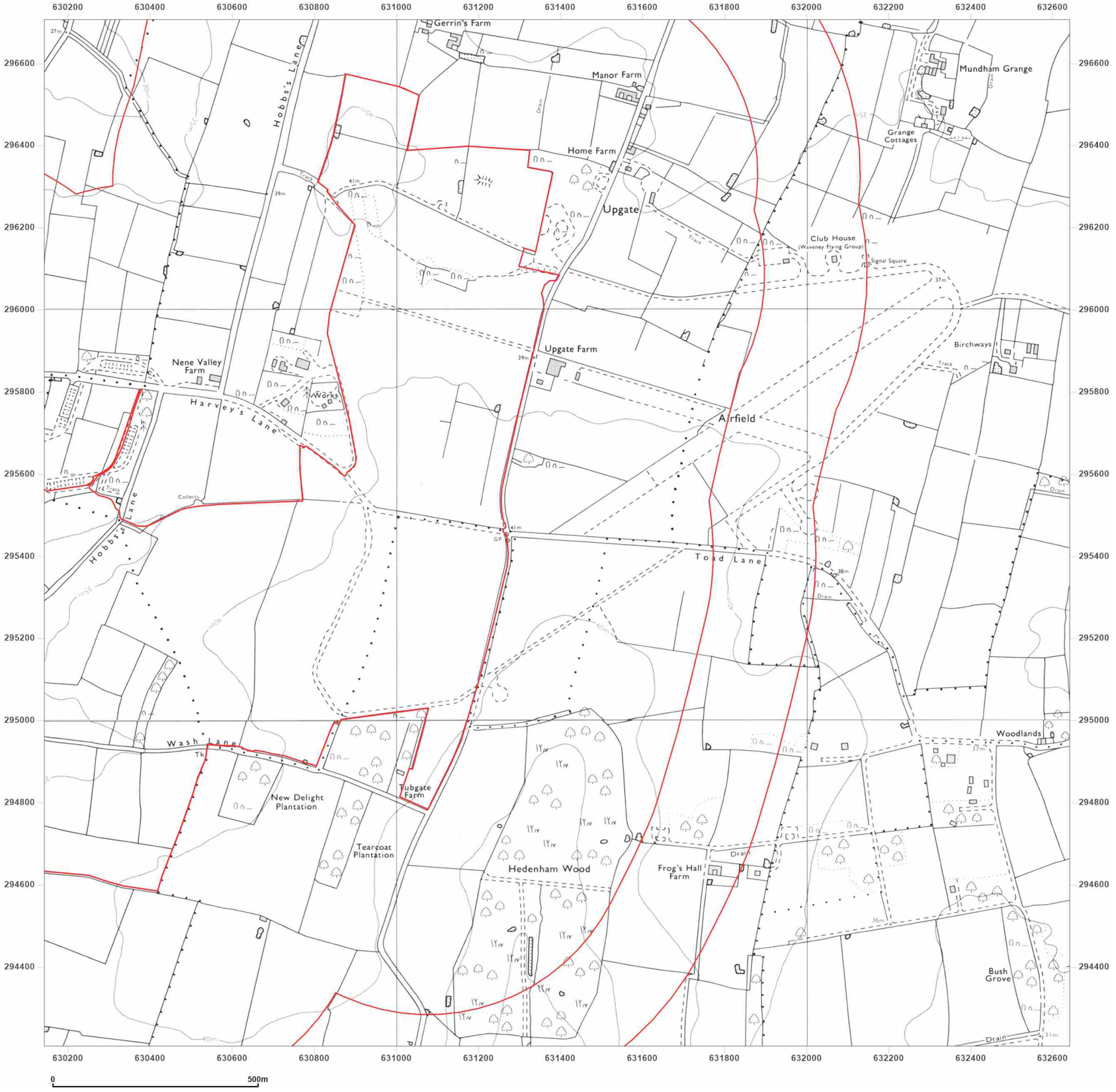
Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: National Grid

Map date: **1971-1973**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
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Surveyed 1972
Revised 1973
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1971
Revised 1971
Edition N/A
Copyright N/A
Levelled N/A

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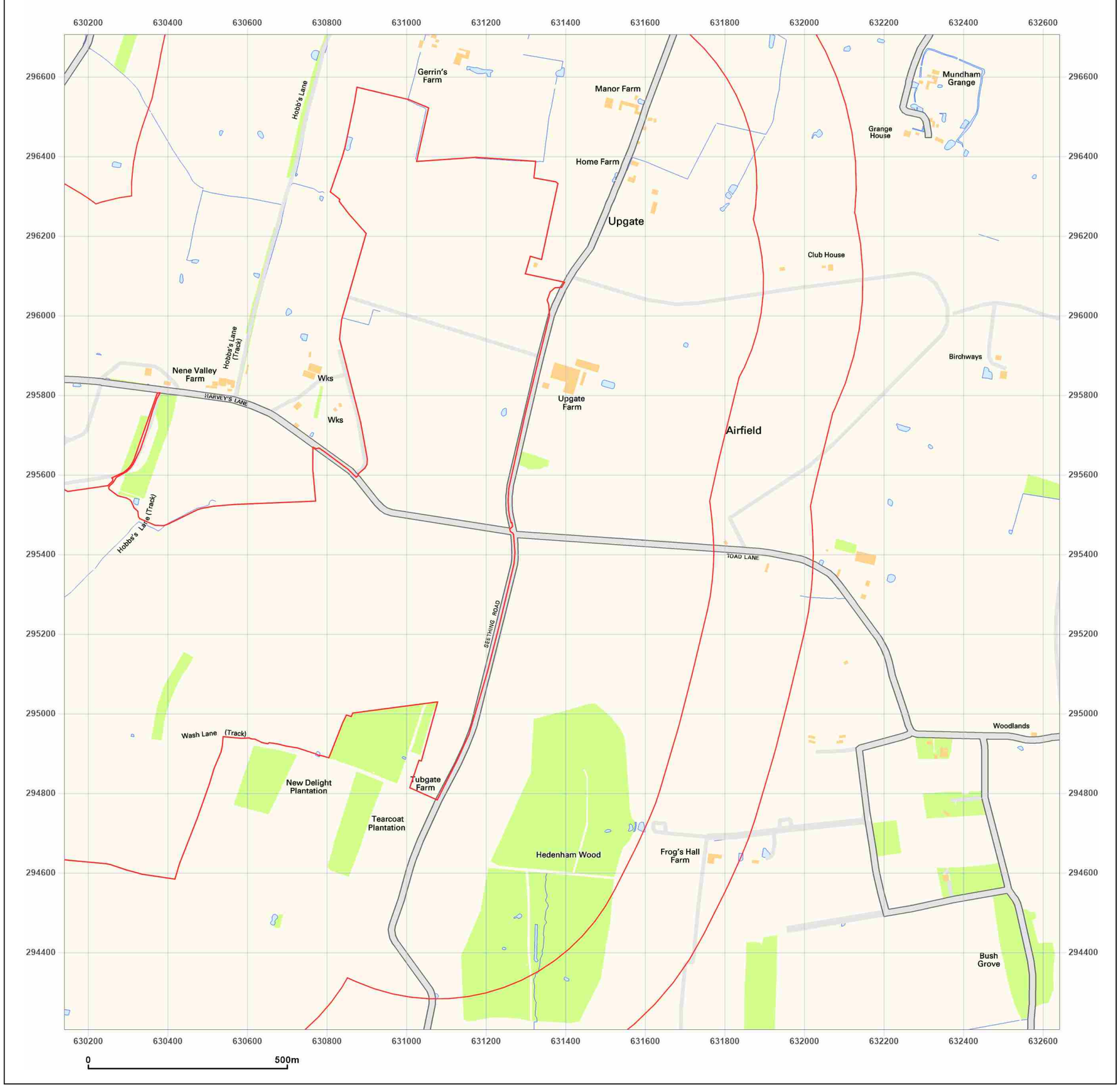
Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: National Grid
Map date: **2001**
Scale: 1:10,000
Printed at: 1:10,000

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2001

Powered by OS

Produced by
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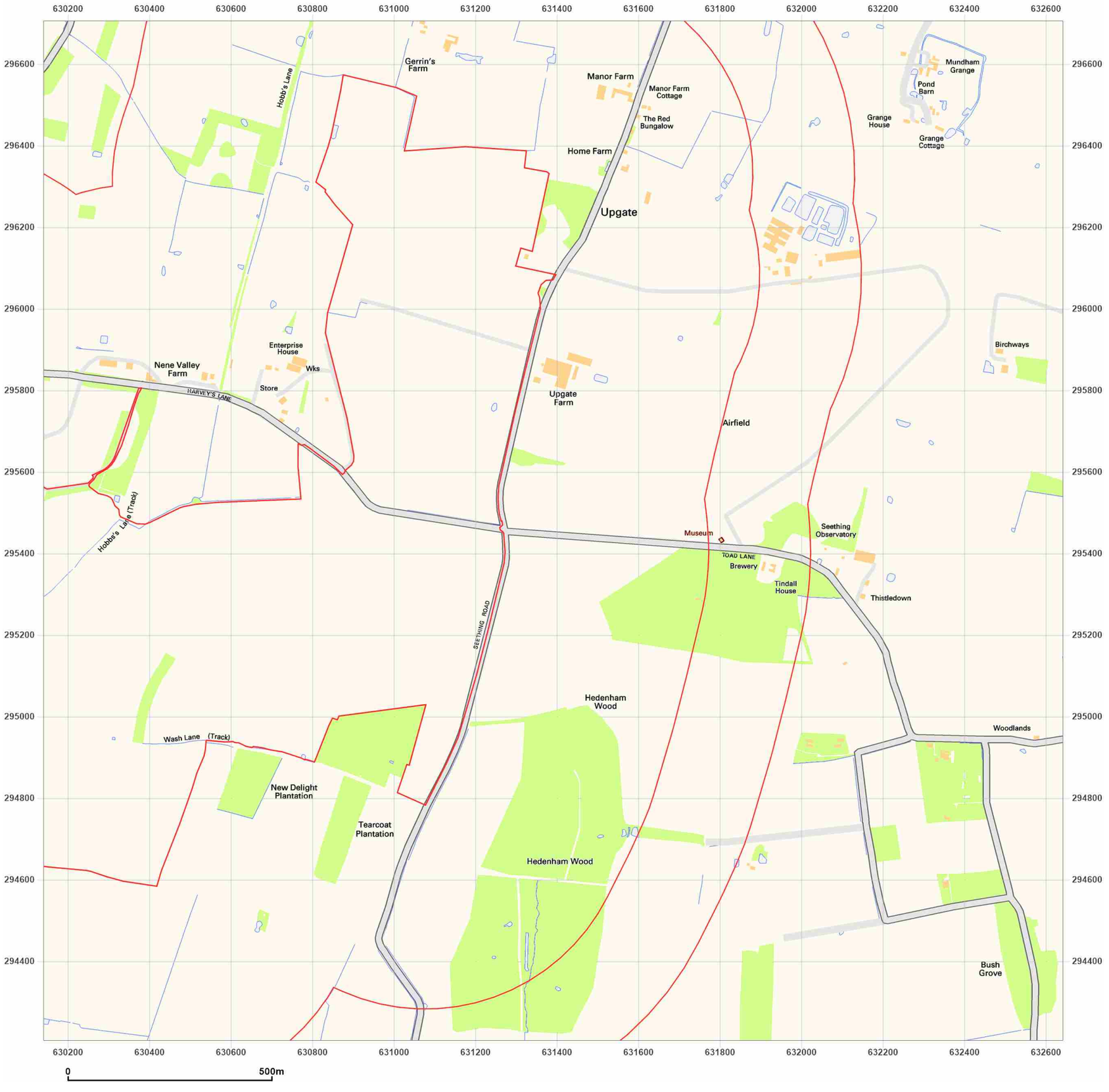
W: www.groundsure.com

Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

Powered by OS

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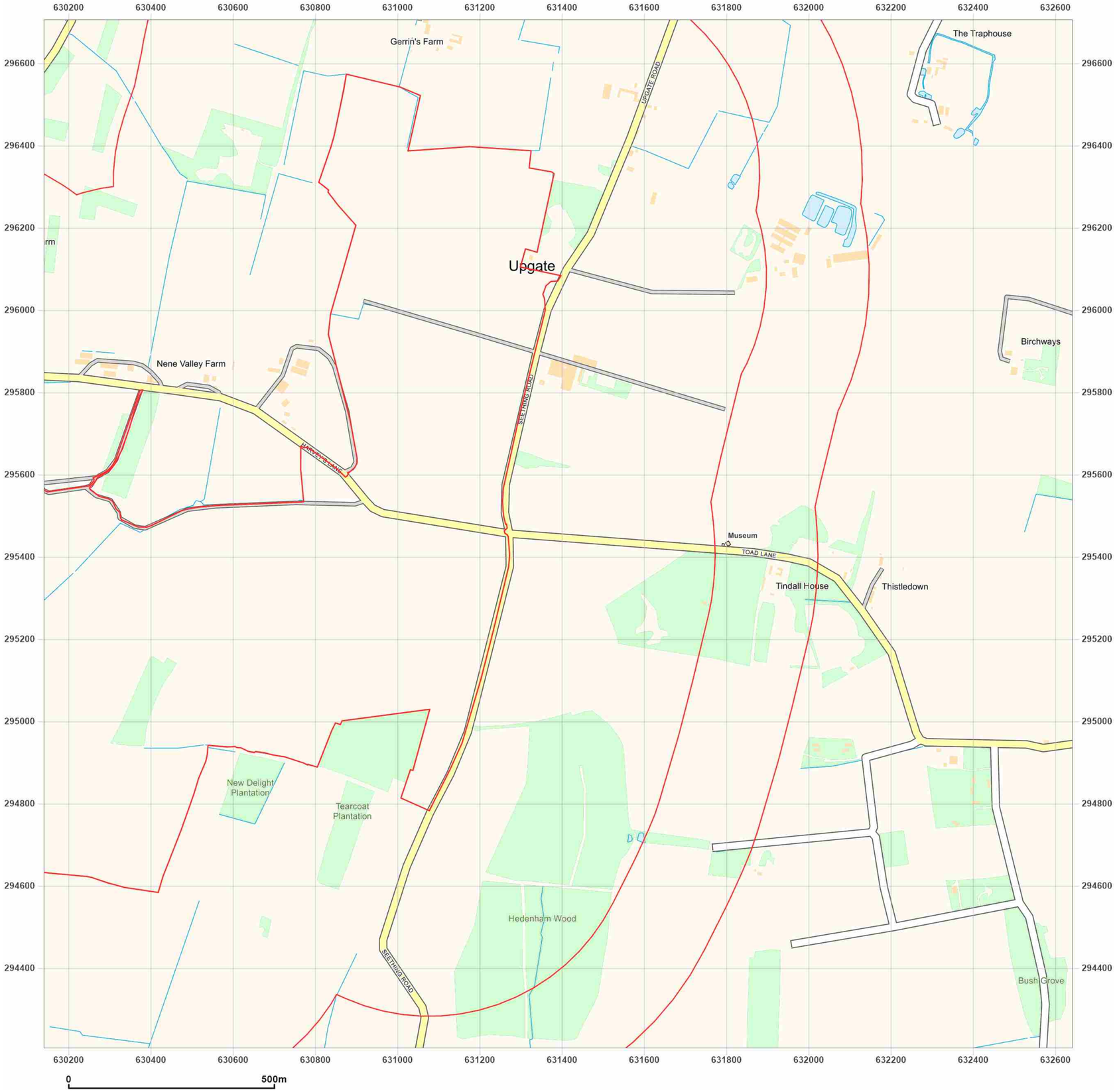
W: www.groundsure.com

Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_4
Grid Ref: 631391, 295456

Map Name: National Grid

Map date: **2024**

Scale: 1:10,000

Printed at: 1:10,000

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W: www.groundsure.com

Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf

Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_5
Grid Ref: 631391, 297956

Map Name: County Series

Map date: **1884**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1884
Revised 1884
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1884
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1884
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1884
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 22 August 2024

Map legend available at:
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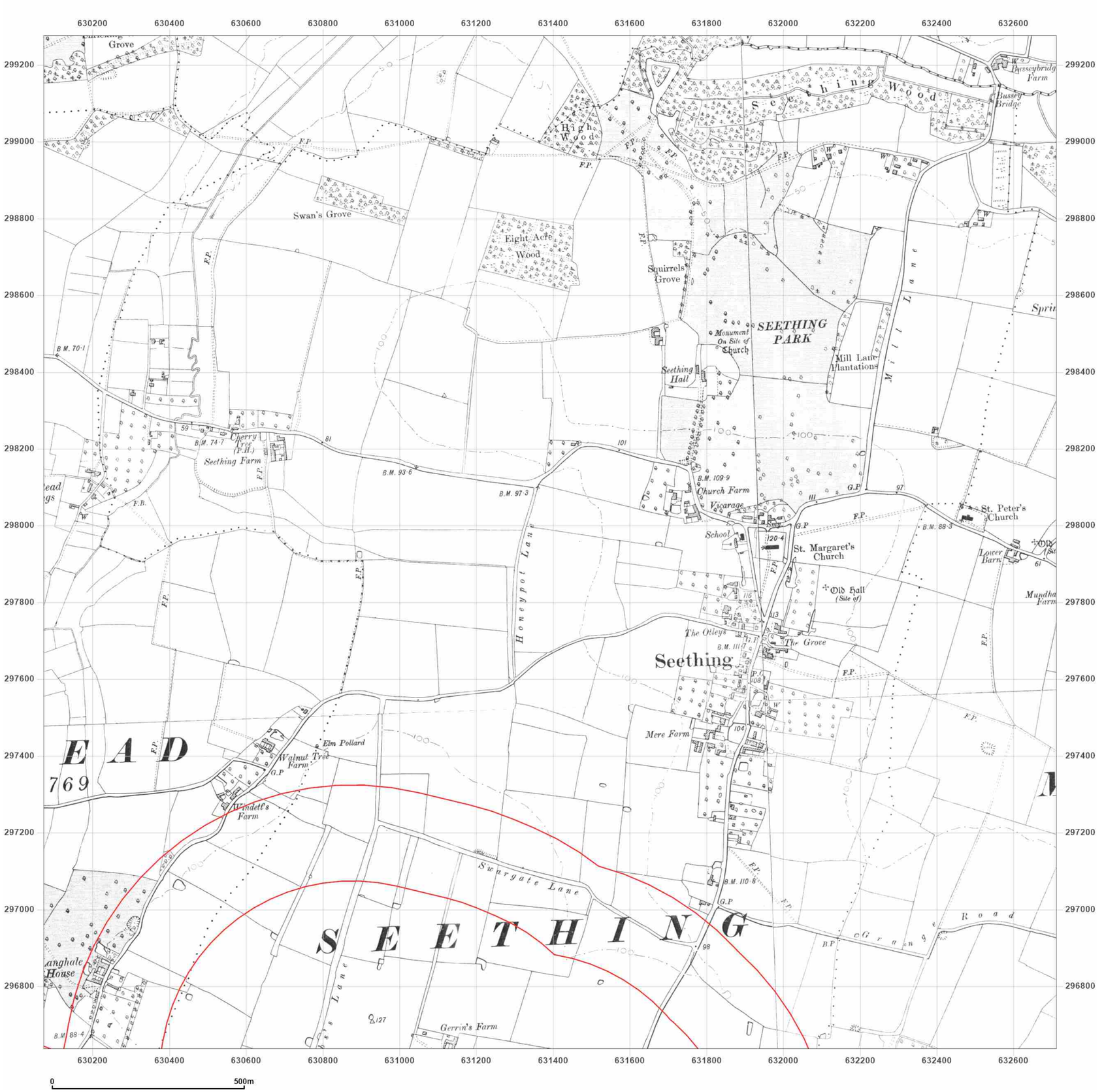

Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_5
Grid Ref: 631391, 297956

Map Name: County Series

Map date: **1907-1908**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1884
Revised 1908
Edition 1908
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1908
Edition 1908
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1907
Edition 1907
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1907
Edition 1907
Copyright N/A
Levelled N/A

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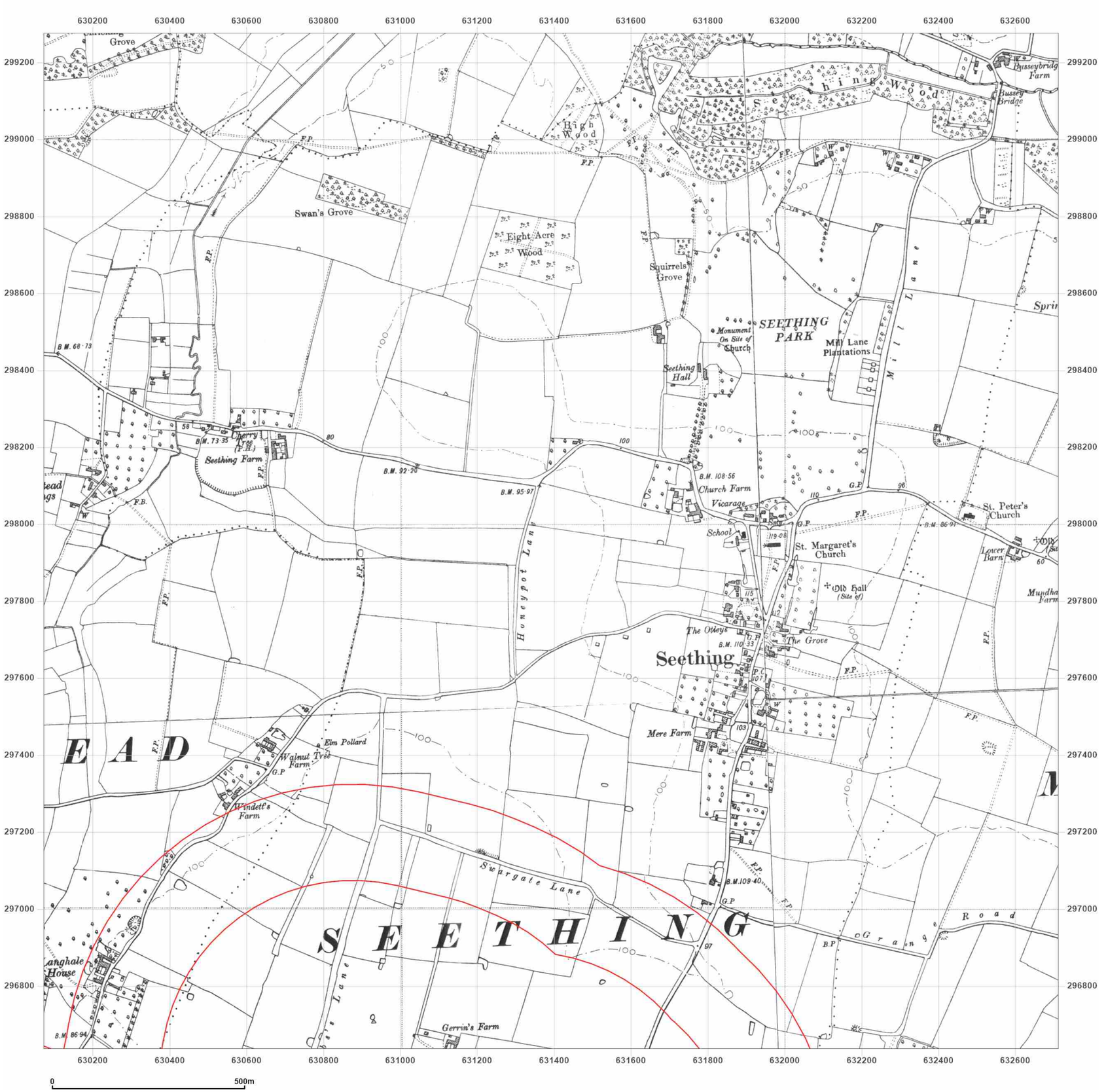
Production date: 22 August 2024

Map legend available at:
www.groundsure.com/sites/default/files/groundsure_legend.pdf



Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_5
Grid Ref: 631391, 297956

Map Name: County Series

Map date: **1946**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1884
Revised 1946
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1946
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1946
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1884
Revised 1946
Edition N/A
Copyright N/A
Levelled N/A

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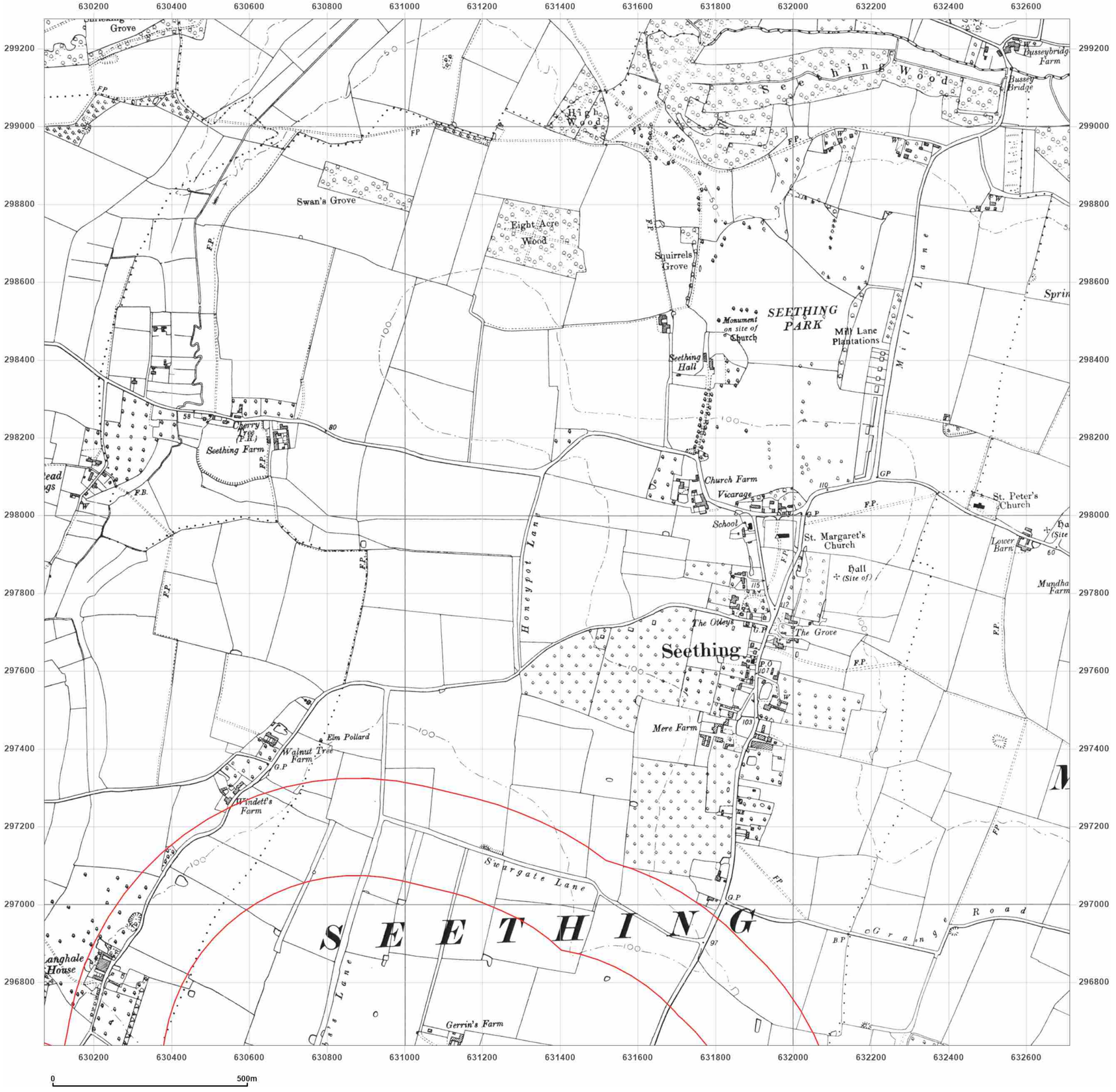

Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_5
Grid Ref: 631391, 297956

Map Name: Provisional
Map date: **1957**
Scale: 1:10,560
Printed at: 1:10,560

N
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Surveyed N/A
Revised 1956
Edition N/A
Copyright 1957
Levelled N/A

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Production date: 22 August 2024

Map legend available at:
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Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_5
Grid Ref: 631391, 297956

Map Name: National Grid

Map date: **1973**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1972
Revised 1973
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 22 August 2024

Map legend available at:
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Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_5
Grid Ref: 631391, 297956

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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2001

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Production date: 22 August 2024

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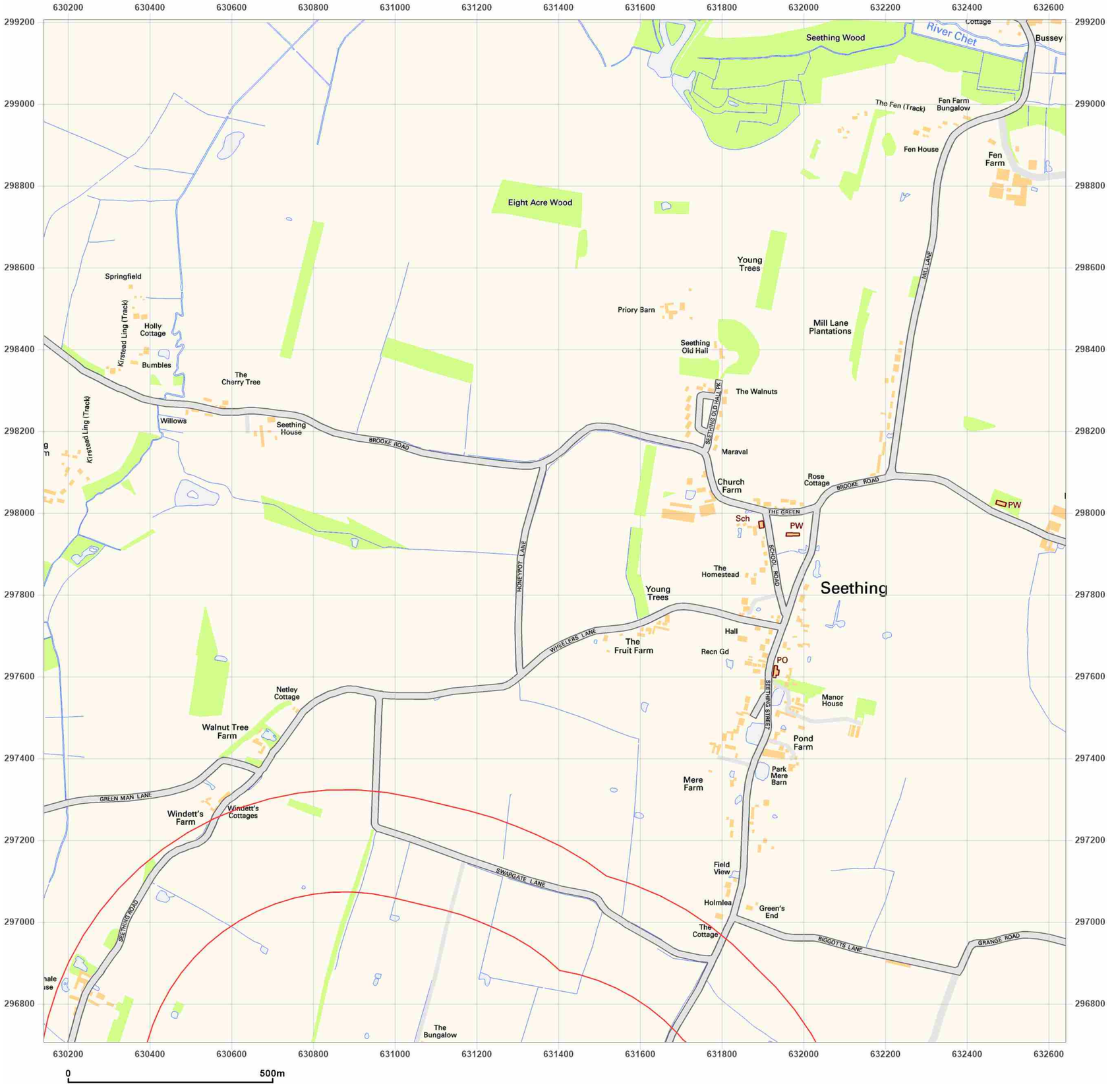

Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_5
Grid Ref: 631391, 297956

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

N
W E
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2010

Powered by OS

Produced by
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W: www.groundsure.com

Production date: 22 August 2024

Map legend available at:
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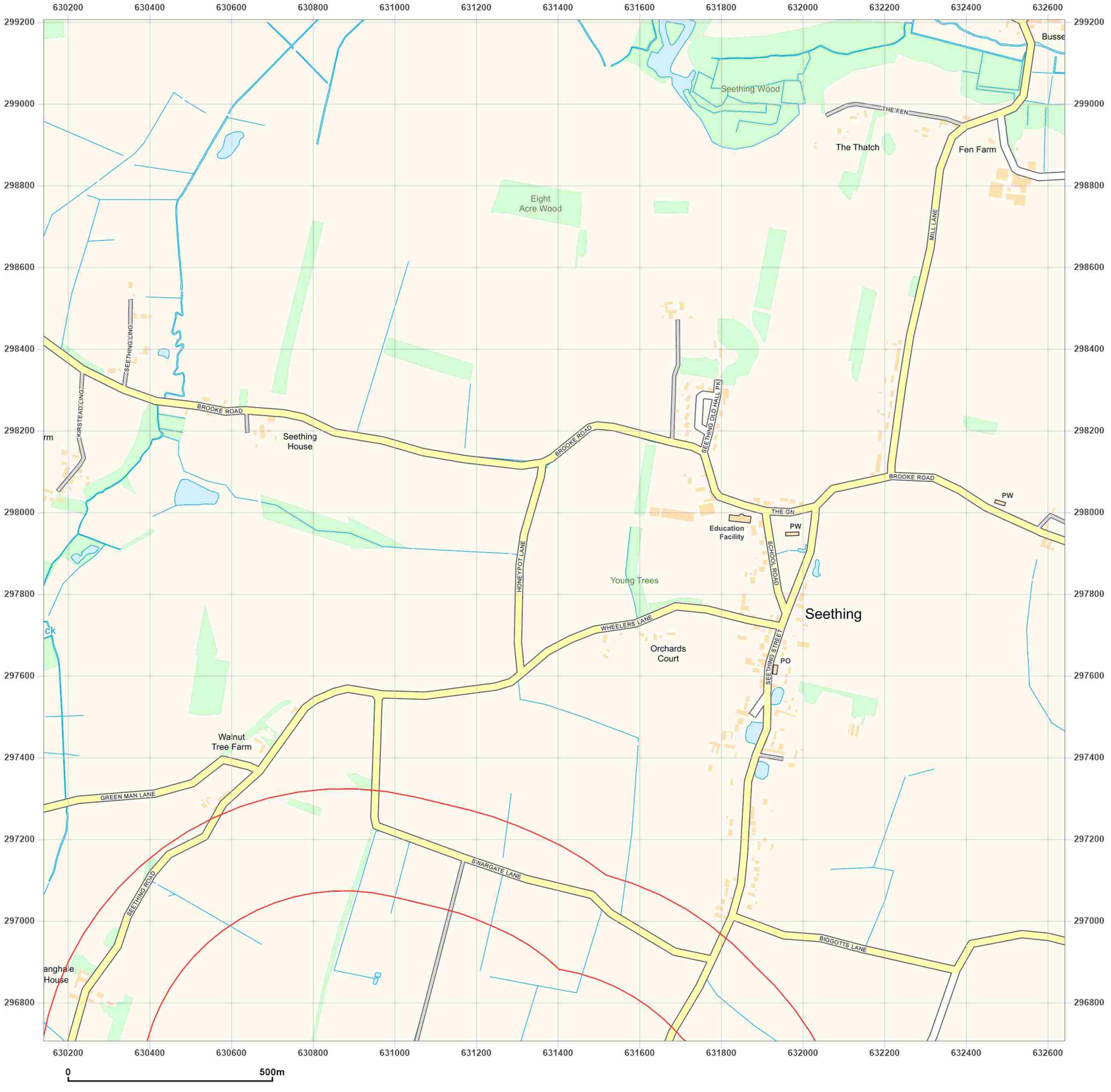

Groundsure INSIGHTS

Site Details:

Long Stratton

Client Ref: East Pye Solar
Report Ref: GSIP-2024-16319-20838_SS_7_5
Grid Ref: 631391, 297956

Map Name: National Grid

Map date: **2024**

Scale: 1:10,000

Printed at: 1:10,000

N
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2024

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Production date: 22 August 2024

Map legend available at:
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Annex 3 Extracts of Relevant BGS Archive Exploratory Holes

TM 29 SW/10

175/522

BOREHOLE RECORD FOR BH No 1

Depth below ground level (ft)	Soil Description	Remarks
0–1	Top Soil	
1–3	Sandy Chalky Clay (Brown)	
3–6	Chalky Boulder Clay (Brown)	
6–20	Chalky Boulder Clay (Blue / Grey)	Firm
20–21	Sandy Gravel	Wet
21–50	Chalky Boulder Clay (Grey)	Stiff
50 (15·2m)		Stopped Boring

[redacted]

Sited by A on 6" Norfolk 97 NE/W 10.12.63. (TM 247 914)

Vertical Scale : 1/8 inch to One Foot.

GRID REFERENCE ~~M 24~~ M247914

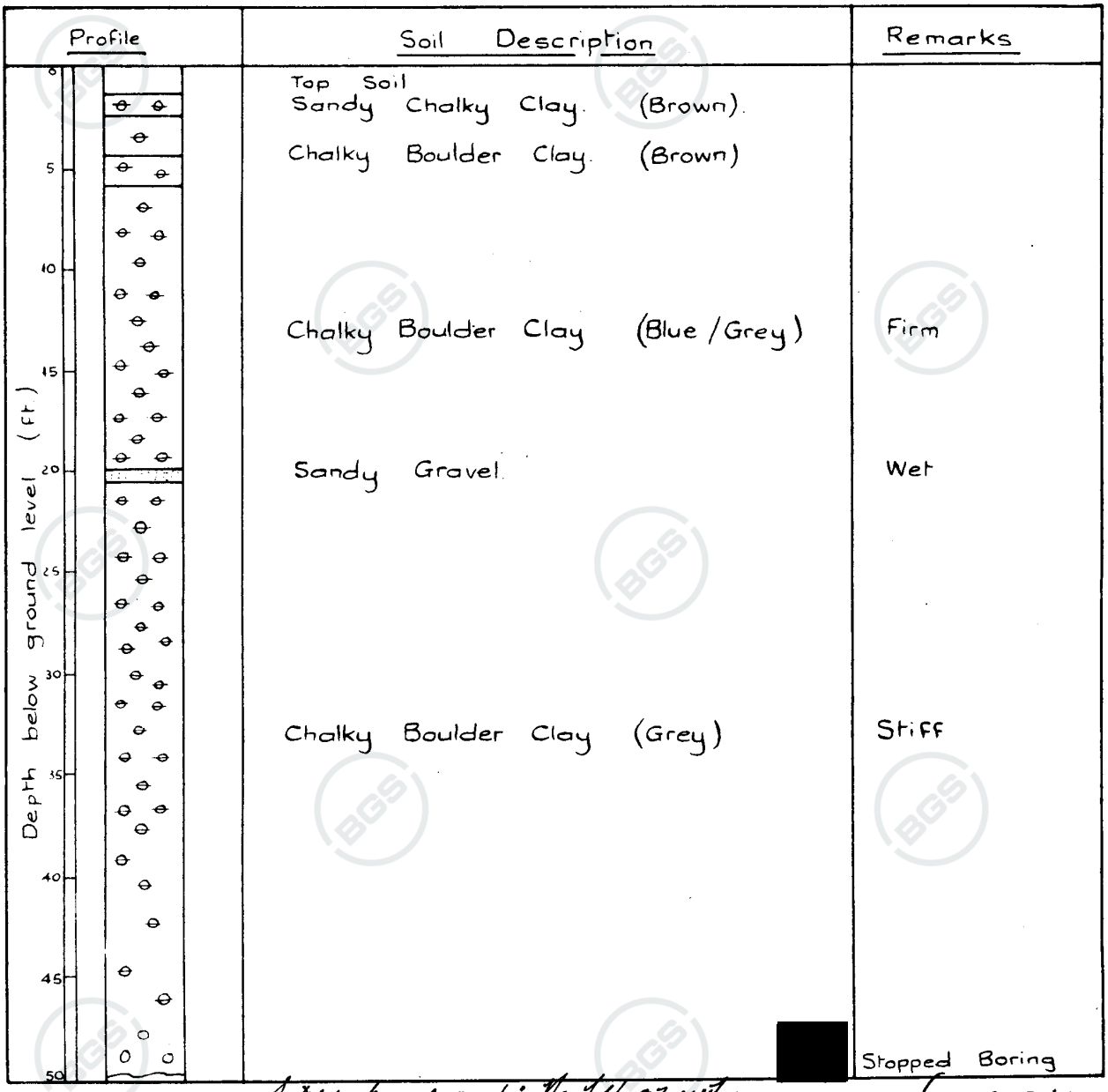
HARDWICK

1

175/522

TM29/60

BOREHOLE RECORD FOR B.H. No 1



Bored by Sam 6" Norfolk 97 Nefw 10.12.63. (TM 247 914)

Vertical Scale : 1/8 inch to One Foot

GRID REFERENCE ~~M~~ M247914

HARDWICK

OAKLEY
SOILS AND CONCRETE ENGINEERING LTD

TM 29SW 32
2474 9100

BOREHOLE No: 23
Sheet 1 of 2

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 19.00m
Casing details: 200mm to 1.50m

Feature:
Location: HARDWICK AIRFIELD
Ground level: 52.61
Coordinates: E N

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Sample	Depth	Test & Instr	Depth (metres)	Reduced Level	Legend	Thickness	Description
3/1/90	200mm					0				
			1	0.30-1.00		0.30	52.31		0.30	TOPSOIL
						1.10	51.51		0.80	Firm brown silty sandy CLAY with some f/m/c chalk and occ assorted flint gravel. Occ flint boulders.
	1.50		2	1.10-1.55		1.40	51.21		0.30	Firm brown sandy CLAY with pockets of orange silty sand. Occasional f/m flint and chalk gravel.
	(1.50)		3	1.90-2.35	90 blows	2				Stiff dark brown silty sandy CLAY with f/m/c chalk and some assorted f/m/c gravel (mostly flint)
			4	2.90		3				
			5	3.50-3.95	100 blows	4				
			6	4.20						
						5				Becoming very stiff.
			7	5.10-5.55	110 blows				16.50	
			8	6.00		6				
			9	6.50-6.95	120 blows					
			10	7.20		7				
			11	7.80-8.25	110 blows	8				
			12	8.50						
			13	9.20-9.65	110 blows	9				
			14	10.00		10				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Q Drill core sample
- x Vane test
- Field permeability test
- m Moisture content (%)

Remarks:

Date started 3.1.90
Date finished 4.1.90

Scale 1 50 metres
Logged by PS
Checked by JEI
Date

Fig No.

WARLEY
SOILS AND CONCRETE ENGINEERING LTD

BOREHOLE No: 23
Sheet 2 of 2

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 19.00m
Casing details: 200mm to 1.50m

Feature:
Location: HARDWICK AIRFIELD
Ground level: 51.61
Coordinates: E N

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth (metres)	Reduced Level	Legend	Thickness	Description
	200mm					10				
			15	10.70-11.15	110 blows	11				
			16	12.00		12				Flint boulders at
				12.10-12.55						
			17	12.60-13.05	110 blows	13				
			18	13.50						
			19	14.00-14.45	110 blows	14				
			20	14.70					16.50	
						15				Flint boulders at
			21	15.50-15.95						
			22	16.00-16.45	110 blows	16				
			23	16.80						
			24	17.20-17.65	110 blows	17				
							17.90	33.71		
			25	18.00		18				Very stiff dark gre; very sandy CLAY wit; f/m/c chalk and occa; f/m/c assorted grave
				18.50-18.95	100 blows				(1.10)	
4.1.90	19.00	DRY				19	33.61			
	(1.50)									
						20				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- m Moisture content (%)

Remarks.

Date started 4/1/90
Date finished 4/1/90

Scale 1
m
Logged by
Checked by
Date
Fig No.

OAKLEY
BOILS AND CONCRETE ENGINEERING LTD

TM 29SW 33
2498 9145

BOREHOLE No: 26
Sheet 1 of 1

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 7.70m
Casing details: 200mm to 1.50m

Feature:
Location: HARDWICK AIRFIELD
Ground level: 50.70m
Coordinates: E .....N .....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Sample	Depth	Test & Instr	Depth (metres)	Reduced Level	Legend	Thickness	Description
18/12/89						0				
	200mm					0.30	50.40		0.30	TOPSOIL
			1	0.40						Firm grey silty sandy CLAY some brown weathering with f/m/c chalk. Occasional assorted gravel and fine decayed roots.
			2	0.95-1.40	80 blows	1			1.60	
	1.50					1.90	48.80			
	(1.50)		3	2.00		2				
			4	2.20-2.65	80 blows	2.40	48.30		0.50	Firm grey silty sandy chalky CLAY with f/m/c chalk. Occ f/m flint gravel
			5	3.10		3				Very stiff dark grey silty sandy CLAY with f/m/c chalk and some f/m/c assorted gravel mostly flint.
			6	3.70-4.05	100 blows	4				
			7	4.70					(5.30)	
			8	5.10-5.55	100 blows	5				Flint boulder at 5.60m.
			9	5.90		6				
			10	6.20-6.65	110 blows					
			11	7.20-7.65	110 blows	7				
19/12/89	7.70	DRY				7.70	43.00			
	(1.50)					8				
						9				
						10				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- Moisture content (%)

Remarks:
STANDPIPE INSTALLED

Date started ...15.12.89...
Date finished 18.12.89

Scale 1:50 metres
Logged by PS
Checked by JBI
Date .....
Fig. No

OAKLEY
SOILS AND CONCRETE ENGINEERING LTD

TM 29SW 34

BOREHOLE No: 17
Sheet 1 of 1

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 7.60m
Casing details: 200mm to 1.50m

2485 9123

Feature:
Location: HARDWICK AIRPORT
Ground level: 52.52m
Coordinates E .....N .....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth (metres)	Reduced Level	Legend	Thickness	Description
21/12/89	200mm					0				
			1 •	0.40		0.40	52.22		0.40	TOPSOIL
	1.50		2 3	1.00-1.45	95 blows	1				Stiff dark grey silty sandy CLAY with f/m/c chalk and some f/m/c assorted gravel (mostly flint). Occasional large pockets of orange brown silty f/m/c sand.
	(1.50)		4	2.00-2.45	100 blows	2				
						3				Becoming very stiff with no sand pockets.
			5 •	3.30						
			6	3.45-3.90	100 blows	4			(7.20)	
			7 •	4.30						
			8	4.90-5.35	110 blows	5				
			9 •	5.90						Flint boulders at 5.50m and 5.90m.
			10	6.45-6.90	100 blows	6				
			11	7.10-7.55	110 blows	7				
21/12/89	7.60	DRY				7.60	45.02			
	(1.50)					8				
						9				
						0				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- Moisture content (%)

Remarks.

PIEZOMETER INSTALLED

Date started 21.12.89
Date finished 21.12.89

Scale 1:50 metres
Logged by PS
Checked by JBJ
Date
Fig. No.

OAKLEY SOILS AND CONCRETE ENGINEERING LTD

TM 29 SW 35
2498 9097

BOREHOLE No: 30
Sheet 1 of 1

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 7.40m
Casing details: 200mm to 1.50m

Feature:
Location: HARDWICK AIRFIELD
Ground level: 51.42
Coordinates: E .... N ....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Sample	Depth	Test & Instr	Depth (metres)	Reduced Level	Legend	Thickness	Description
20/12/89	200mm					0.30	51.12		0.30	TOPSOIL
			1 •	0.50						Firm greyish brown silty sandy CLAY with some f/m/c chalk and occasional f/m/c flint gravel.
	1.50 (1.50)		2	1.10-1.55	80 blows					
			3 •	1.80						
										Flint boulder at 2.10m.
			4	2.50-2.95						
			5	3.10-3.55	100 blows					Becoming very stiff dark grey silty sandy CLAY with f/m/c chalk and some f/m/c assorted gravel (mostly flint).
			6 •	4.00					(7.20)	
			7	4.50-4.95	100 blows					
			8 •	5.30						
			9	6.00-6.45	110 blows					
			10 •	6.70						
			11	6.90-7.35	110 blows					
20/12/89	7.50 (1.50)	DRY				7.50	43.92			

Key:
- ● Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- ▲ Water sample
- D Drill core sample
- X Vane test
- Field permeability test
- m Moisture content (%)

Remarks: PIEZOMETER INSTALLED

Date started: 20.12.89
Date finished: 20.12.89

Scale 1:50 metres
Logged by: PS
Checked by: JEJ
Date:
Fig No.

OAKLEY
BOILS AND CONCRETE ENGINEERING LTD

TM 29SW 36
24519096

BOREHOLE No: 31
Sheet 1 of 1

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 7.50m
Casing details: 200mm to 1.50m

Feature:
Location: HARDWICK AIRFIELD
Ground level: 52.63m
Coordinates: E ..... N .....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth (metres)	Reduced Level	Legend	Thickness	Description
2/1/90						0				
	200mm					0.20	52.43		0.20	Brown clayey TOPSOIL.
			1 •	0.50						Firm greyish brown silty sandy CLAY with some f/m/c chalk. Occasional assorted f/m/c gravel.
	1.50		2	1.10-1.55	120 blows	1				
	(1.50)		3 •	2.00		2				Becoming very stiff dark grey silty sandy CLAY with some f/m/c chalk and assorted f/m/c gravel (mostly flint).
			4	2.50-2.95	110 blows	3				
			5 •	3.50					(7.30)	Flint boulder at 3.80m.
			6	3.90-4.35	110 blows	4				
			7	4.40-4.85	110 blows	5				
			8	5.50-5.95	120 blows	6				
			9 •	6.30						
2/1/90	7.50	DRY	10	7.00-7.45	110 blows	7.50	45.13			
	(1.50)					8				
						9				
						10				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- Moisture content (%)

Remarks

STANDPIPE INSTALLED

Date started 2.1.90
Date finished 2.1.90

Scale 1 50 metres
Logged by PS
Checked by JBJ
Date
Fig No.

OAKLEY
BORE AND CONCRETE ENGINEERING LTD

TM 29SW 37
2466 9083

BOREHOLE No: 32
Sheet 1 of 1

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 7.50m
Dia of boring: 200mm to 6.00m
Casing details:

Feature:
Location: HARDWICK AIRFIELD
Ground level: 52.45m
Coordinates: E ..... N .....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth (metres)	Reduced Level	Legend	Thickness	Description
3/1/90	200mm					0.90	52.38		0.10	Clayey TOPSOIL
			1	0.40-1.00		1				Firm grey silty sandy CLAY with some f/m/c chalk and occasional f/m/c assorted gravel.
	1.50		2	1.20-1.65		2				
	(1.50)		3	2.00-2.45	100 blows					
			4	2.70		3			5.20	Becoming very stiff.
			5	3.50-3.95	100 blows	4				
			6	4.30						
			7	4.90-5.25	110 blows	5				
			8	5.50		5.30	47.18			
	6.00					5.80	46.58		0.50	Brown f/m silty SAND with lumps of dark grey silty sandy clay containing f/m/c chalk. Occ flints.
	(6.00)		9	6.30-6.75		6				Very stiff dark grey silty sandy CLAY with f/m/c chalk and some f/m/c assorted gravel (mostly flint).
						7			1.70	
3/1/90	7.50	DRY	10	7.00-7.45	110 blows	7.50	44.98			
	(1.50)					8				
						9				
						10				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- Moisture content (%)

Remarks.

STANDPIPE INSTALLED

Date started ....3.1.90....
Date finished ....3.1.90....

Scale 1 50 metres
Logged by ....PS....
Checked by ....JEJ....
Date ....
Fig No.

OAKLEY
BOILS AND CONCRETE ENGINEERING LTD

TM 29 SW 38

BOREHOLE No: 33
Sheet 1 of 1

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 7.50m
Casing details: 200mm to 3.00m

2444 9069

Feature: HARDWICK AIRFIELD
Location:
Ground level: 51.45m
Coordinates: E ..... N .....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth	Reduced Level	Legend	Thickness	Description
2/1/90						metres 0				
	200mm		1	0.50						Stiff light grey silty sandy CLAY with some brown weathering, f/m/c chalk and occasional f/m/c assorted gravel. Fine live roots.
			2	1.20-1.65	90 blows	1				
			3	2.00		2				
	3.00		4	2.70-3.15	80 blows	3				
	(3.00)		5	3.60						
			6	4.20-4.65	100 blows	4			(7.50)	Becoming very stiff dark grey silty sandy CLAY with f/m/c chalk and some f/m/c assorted gravel (mostly flint).
			7	5.00		5				
			8	5.70-5.15	100 blows	6				
			9	6.40						
2/1/90	7.50	DRY	10	7.00-7.45	100 blows	7.50	43.95			
	(3.00)					8				
						9				
						0				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- Moisture content (%)

Remarks

PIEZOMETER INSTALLED

Date started ...

Scale 1 50 metres
Logged by PS
Checked by JEI
Date ...
Fig No.

WILLS
SOILS AND CONCRETE ENGINEERING LTD

TM 29SE 14
25229148

BOREHOLE No: 21
Sheet 1 of 2

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 15.50m
Casing details: 200mm to 6.10m

Feature:
Location: HAPSWICK AIRFIELD
Ground level: 49.69
Coordinates: E ..... N .....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth	Reduced Level	Legend	Thickness	Description
3.1.90	200mm		1	0.50-0.70		metres 0				
						0.30	49.39		0.30	TOPSOIL
						0.80	48.89		0.50	Firm orangish brown silty sandy CLAY with some light grey mottling. f/m sub-angular flint gravel. Occasional f/m chalk.
			2	1.00-1.45	60 blows	1.20	48.49		0.40	
			3	1.50						Very dense orangish brown and light grey silty clayey f/m SAND. Occ f/m/c subangular flint gravel.
			4	2.00		2			1.70	
			5	2.50-2.95	47 blows					Stiff brown silty sandy CLAY with very sandy pockets, f/m/c chalk, occ subangular assorted gravel (mostly flint)
			6	3.00		2.90	46.79			
			7	3.50		3				Stiff brown silty very sandy CLAY with some f/m/c chalk and occasional thin bands of subangular flint gravel.
			8	4.00-4.50		4			1.80	
						4.70	44.99			
			9	5.00-5.45	38 blows	5				Stiff dark grey silty sandy CLAY with some f/m/c chalk and assorted f/m/c gravel (mostly flint)
			10	5.50						
	6.00		11	6.00		6				
	(6.00)		12	6.50-6.95	47 blows					
			13	7.00		7			11.10	
			14	7.50						
			15	8.00-8.45	62 blows	8				Becoming very stiff.
			16	8.50						
			17	9.00		9				
			18	9.50-9.95	70 blows					
			19	10.00		10				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- Moisture content (%)

Remarks.

Date started 3.1.90
Date finished 3.1.90

Scale 1 50 metres
Logged by ...
Checked by ...
Date ...

Fig No.

OAKLEY
SOILS AND CONCRETE ENGINEERING LTD

BOREHOLE No: 21
Sheet 2 of 2

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 16.50m
Casing details: 200mm to 6.10m

Feature:
Location: HARDWICK AIRFIELD
Ground level: 49.69
Coordinates: E ..... N .....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth	Reduced Level	Legend	Thickness	Description
	200mm					metres 10				
			20	10.50						
			21	11.00-11.45		11				
			22	11.50						
			23	12.00		12				
			24	12.50-12.95	50 blows					
			25	13.00		13				
			26	13.50					11.10	
			27	14.00-14.45		14				
			28	15.00-15.45		15				
						15.80	33.89			
			29	16.00-16.45	100 blows	16			(0.70)	Dense light brown silty calcareous f/m SAND. Some f/m/c subangular to rounded flint gravel, occ quartzite. Occasional f/m chalk.
3.1.90	16.50	DRY	30	16.50		16.50	33.19			
	(6.00)					17				
						18				
						19				
						20				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- Moisture content (%)

Remarks:
1 hour chiselling flint cobbles 14.0 - 15.80m.

Date started 3.1.90
Date finished 3.1.90

Scale 1:50 metres
Logged by JM
Checked by JBL
Date
Fig No.

UNIBEST
BOLS AND CONCRETE ENGINEERING LTD

TM 29 SE 15
2527 9104

BOREHOLE No: 22
Sheet 1 of 4

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 20.25m 150mm to 36.00m
Casing details: 200mm to 2.70m 150mm to 36.00m

Feature:
Location: HARDWICK AIRFIELD
Ground level: 49.15
Coordinates: E N

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth	Reduced Level	Legend	Thickness	Description
12/12/89	200mm		1	0.40		0.40	48.75		0.40	Brown gravelly TOPSOIL.
			2	1.00-1.45	47 blows					Firm to stiff brown silty sandy CLAY with some f/m/c chalk and occasional assorted f/m/c gravel.
			3	2.00						Becoming grey with occ flint cobbles and boulders
	2.70 (2.70)		4	2.90-3.35	44 blows					
			5	4.00						
			* 6	4.50-4.95	70 blows					
			7	5.50					15.60	Very chalky.
			* 8	6.10-6.50	70 blows					
			9	6.50						
			10	6.50-6.95	108 blows					
			11	7.50						
			12	8.00-8.45	104 blows					Becoming very stiff dark grey silty sandy CLAY with f/m/c chalk and some assorted gravel (mostly flint). Occasional flint cobbles and boulders.
			13	9.00						

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- m Moisture content (%)

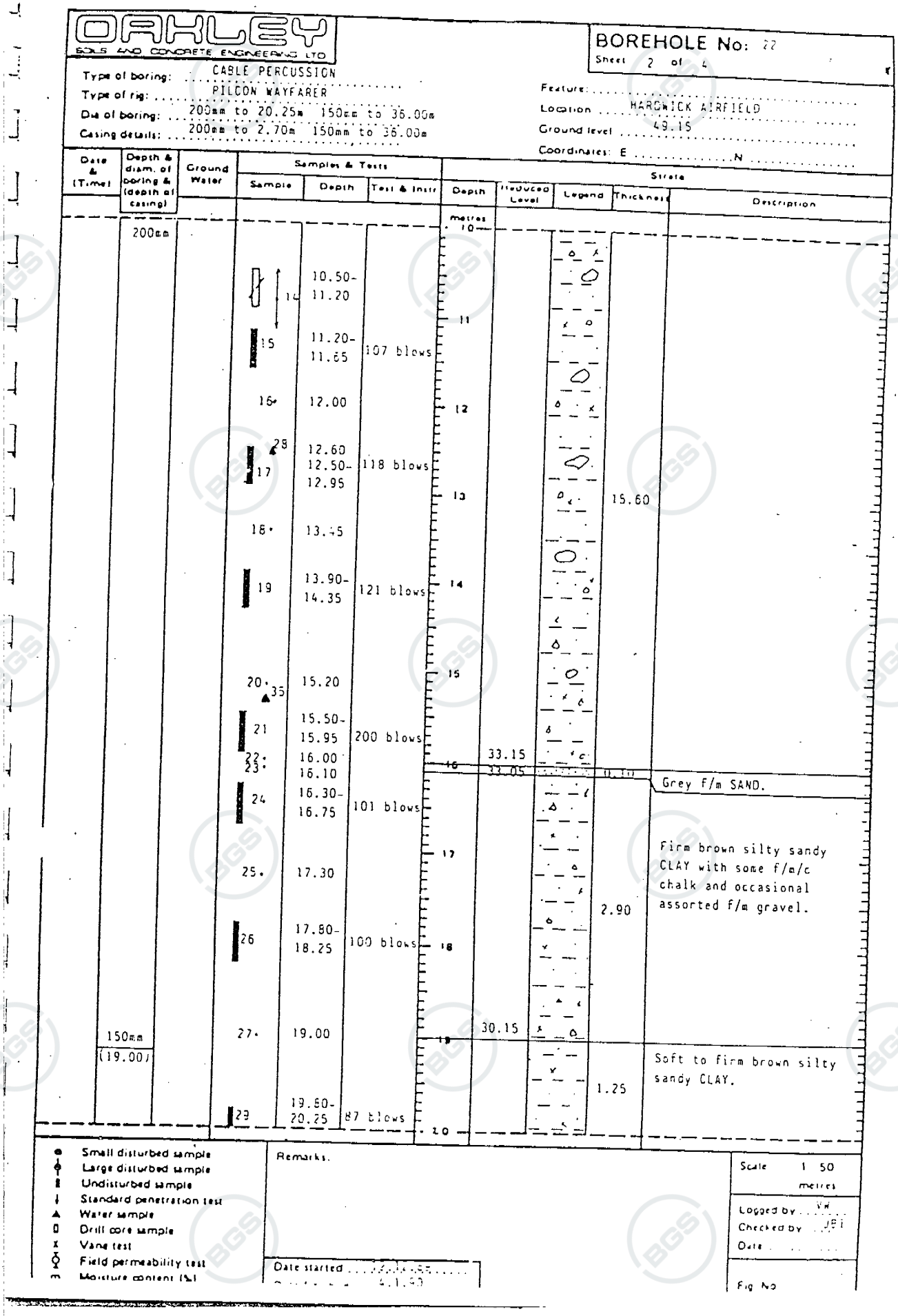
Remarks:

* U100 obstructed by flints

STANDPIPE INSTALLED

Date started 12.12.89
Date finished 4.1.90

Scale 1:50 metres
Logged by
Checked by
Date
Fig. No.



BOLS AND CONCRETE ENGINEERING LTD

TM29SE 15
2527 9104

BOREHOLE No: 22
Sheet 3 of 4

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 20.25m 150mm to 36.00m
Casing details: 200mm to 2.70m 150mm to 35.00m

Feature
Location HARDWICK AIRFIELD
Ground level 49.15
Coordinates E N

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Insts	Strata: Depth (metres)	Reduced Level	Legend	Thickness	Description
	200mm		29			20	29.00			
			30	20.25					0.65	Brown silty f/m SAND with some f/m flint gravel and occ chalk fragments.
			31	20.30-20.90		21	28.25		0.70	Firm brown sandy CLAY.
			32	20.90			27.55		0.60	Firm light brown silty CLAY with some partings of grey silt.
			33	21.60		22	26.95		1.20	f/m/c subangular to well rounded flint GRAVEL. Occasional cobbles with some brown silty f/m/c sand.
			34	22.20-22.70		23	25.75		2.60	f/m/c subangular to well rounded flint GRAVEL. Occasional black flint cobbles with some grey f/m/c silty sand.
			36	23.40-24.00		24				
						25				
						26	23.15		(10.00)	Dark grey clayey silty f/m SAND.
			37	26.00-27.00		27				
						28				
						29				
						30				

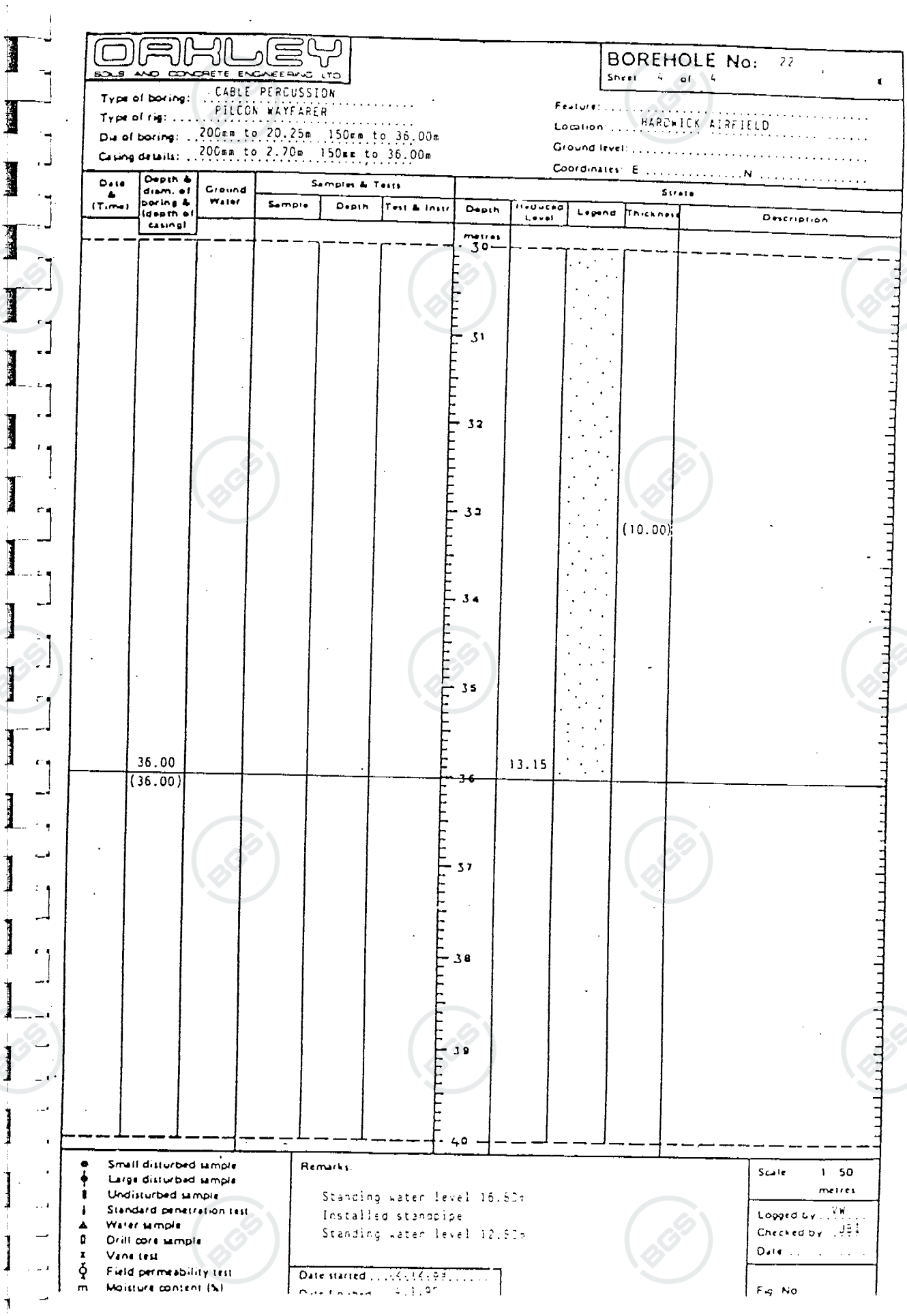
- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- m Moisture content (%)

Remarks

Date started 4.12.99
Date finished 4.1.00

Scale 1 50 metres
Logged by JM
Checked by JSI
Date

Fig No



OAKLEY
BOILS AND CONCRETE ENGINEERING LTD

BOREHOLE No: 22
Sheet 4 of 4

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 20.25m 150mm to 36.00m
Casing details: 200mm to 2.70m 150mm to 36.00m

Feature:
Location: HARDWICK AIRFIELD
Ground level:
Coordinates: E N

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth	Reduced Level	Legend	Thickness	Description
						metres 30				
						31				
						32				
						33			(10.00)	
						34				
						35				
	36.00 (36.00)					36	13.15			
						37				
						38				
						39				
						40				

Small disturbed sample
Large disturbed sample
Undisturbed sample
Standard penetration test
Water sample
Drill core sample
Vane test
Field permeability test
Moisture content (%)

Remarks.

Standing water level 16.50m
Installed standpipe
Standing water level 12.50m

Date started 6.11.89

Scale 1 50 metres

Logged by VW
Checked by JBJ
Date

Fig No

ORKLEY
SOILS AND CONCRETE ENGINEERING LTD

TM 2952 16
2523 9178

BOREHOLE No: 24
Sheet 1 of 1

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 7.50m
Casing details: 200mm to 2.50m

Feature:
Location: HARDWICK AIRFIELD
Ground level 48.00
Coordinates: E ..... N .....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth	Reduced Level	Legend	Thickness	Description
21/12/89	200mm					metres 0				
			1	0.40-0.80		0.40	47.60		0.40	Soft brown TOPSOIL.
			2	1.00-1.45	47 blows	1			1.70	Stiff orangish brown silty very sandy calcareous CLAY some bands of f/m/c sub angular flint gravel. Occasional f/m chalk.
			3 •	2.00		2.30	45.90			
	2.50									
	(2.50)		4	2.50-2.95	40 blows	3			2.20	Stiff light grey silty sandy CLAY. Some f/m/c chalk. Occasional small pockets of fine orange sand.
			5 •	3.50						
			6	4.10-4.55	28 blows	4 4.30	43.70			
			7 •	4.60					0.80	Stiff light brown very chalky silty sandy CLAY with some f/m chalk.
			8 •	5.20		5.50	42.90			
			9	5.50-5.95	51 blows					Stiff to very stiff dark grey silty sandy CLAY with f/m/c chalk and some f/m/c assorted gravel (mostly flint)
			10•	6.00		6				
			11•	6.50					(2.40)	
			12	7.00-7.45	60 blows	7				
21/12/89	7.50	DRY	13•	7.50		7.50	40.50			
	(2.50)					8				
						9				
						10				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- Moisture content (%)

Remarks.

STANDPIPE INSTALLED

Date started 21.12.89
Date finished 21.12.89

Scale 1 50 metres
Logged by ...
Checked by ...
Date ...

Fig No.

OAKLEY
SOILS AND CONCRETE ENGINEERING LTD

TM29SE 17

BOREHOLE No: 25
Sheet 1 of 1

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 7.60m
Casing details: 200mm to 2.00m

2505 9163

Feature:
Location: HARDWICK AIRFIELD
Ground level: 49.88m
Coordinates: E ..... N .....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Samples & Tests: Sample	Depth	Test & Instr	Strata: Depth (metres)	Reduced Level	Legend	Thickness	Description
18/12/89	200mm		1	0.50		0				
						0.40	49.48		0.40	TOPSOIL
			2 3	1.00 1.45	70 blows					Firm light brown silty sandy slightly chalky CLAY. Occasional f/m chalk.
			4	1.00-1.50 1.65		1.10	48.78		0.70	
	2.00					1.70	48.18		0.60	Soft to firm light brown silty very sandy CLAY. Occasional f/m flint gravel and f/m chalk. Small pockets of light brown f/m sand.
	(2.00)		5	2.00-2.45	80 blows	2				
			6	2.50						Stiff brownish grey silty sandy CLAY with some f/m/c chalk. Occasional f/m/c assorted gravel. Occ flint boulders.
			7	3.00		3				
			8	3.55-4.00	100 blows					Becoming very stiff and dark grey.
			9	4.70		4			(5.90)	
			10	5.00-5.45	110 blows					
			11	6.00		5				
			12	6.50-6.95	100 blows	6				
			13	7.10-7.55	100 blows	7				
18/12/89	7.60	DRY				7.60	42.28			
	(2.00)					8				
						9				
						10				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- m Moisture content (%)

Remarks.

PIEZOMETER INSTALLED

Date started ...15.12.89...
Date finished ...18.12.89...

Scale 1:50 metres
Logged by PS
Checked by JBI
Date .....
Fig No

OAKLEY
BOILS AND CONCRETE ENGINEERING LTD

TM29SE 18

BOREHOLE No: 26
Sheet 1 of 1

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 7.50m
Casing details: 200mm to 1.50m

2509 9123

Feature:
Location: HARDWICK AIRFIELD
Ground level: 51.07m
Coordinates: E ..... N .....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Sample	Depth	Test & Instr	Strata: Depth	Reduced Level	Legend	Thickness	Description
19/12/89	200mm					metres 0				
						0.30	50.77		0.30	Clayey TOPSOIL.
			1	0.50						Very stiff greyish brown silty sandy CLAY with some f/m/c chalk, occ f/m flints and large pockets of orangish brown silty sand.
	1.50		2	1.00-1.45	80 blows	1				
	(1.50)		3	1.80						
			4	2.50-2.95	90 blows	2				
						3				
			5	3.70						Becoming very stiff dark grey with no sand pockets.
			6	4.00-4.45	100 blows	4			(7.20)	
		SEEPAGE (4.80)	7	5.00		5				Flint boulder at 4.90m.
			8	5.80						
			9	5.90-6.35		6				
19/12/89			10	7.00-7.45		7				
						7.50	53.57			
						8				
						9				
						0				

- Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Water sample
- Drill core sample
- Vane test
- Field permeability test
- m Moisture content (%)

Remarks:

STANDPIPE INSTALLED

Date started 19.12.89
Date finished 19.12.89

Scale 1:50 metres
Logged by PS
Checked by JBI
Date
Fig No.

OAKLEY SOILS AND CONCRETE ENGINEERING LTD

TM29SE19

2529 9124

BOREHOLE No: 29

Sheet 1 of 1

Type of boring: CABLE PERCUSSION
Type of rig: PILCON WAYFARER
Dia of boring: 200mm to 7.50m
Casing details: 200mm to 1.50m

Feature:
Location: HARDWICK AIRFIELD
Ground level: 49.95m
Coordinates: E .... N ....

Date & (Time)	Depth & diam. of boring & (depth of casing)	Ground Water	Sample	Depth	Test & Instr	Depth (metres)	Reduced Level	Legend	Thickness	Description
2/1/90	200mm					0.30	49.65		0.30	TOPSOIL
			1	0.50-0.95	35 blows	0.80	49.15		0.50	Stiff brown silty sandy CLAY with some f/m/c chalk and occasional f/m/c flint gravel. Traces of orangish brown weathering.
			2•	1.00						
	1.50 (1.50)		3•	1.50						Stiff dark grey silty sandy CLAY with f/m/c chalk and some assorted gravel (mostly flints).
			4	2.00-2.45	75 blows					
			5•	2.50						
			6•	3.00						
			7	3.80-4.25	100 blows					Becoming very stiff.
			8•	4.30					(6.70)	
			9•	4.80						
			10	5.30-5.75	100 blows					
			11•	5.80						
			12•	6.50						
			13	7.00-7.45	90 blows					
3/1/90	7.50 (1.50)	DRY	14•	7.50		7.50	42.45			

Key:
- ● Small disturbed sample
- Large disturbed sample
- Undisturbed sample
- Standard penetration test
- Δ Water sample
- 0 Drill core sample
- x Vane test
- Field permeability test
- m Moisture content (%)

Remarks: PIEZOMETER INSTALLED

Date started ....2.1.90....
Date finished ....3.1.90....

Scale 1:50 metres
Logged by JM
Checked by JEJ
Date
Fig No

RECORD OF WELL (SHAFT OR BORE)

(attach copy of analysis if available)

1" 175 *For Survey use only* N.3576

175/392

TM 18 NE/1

EXACT SITE OF WELL

At Willow Farm TM1793 2883

Town or Village ~~Great Melton~~ Great Melton

County Norfolk Six-inch quarter sheet 97 SW/W

For Mr. J. Wilson State whether owner, tenant, builder, contractor, consultant, etc. :— Owner

Address (if different from above)

Level of ground surface above sea-level (O.D.) c 178 56.25 ft. If well-top is not at ground level, state how far ... above / below ; ft.

SHAFT ft. ; diameter ft. ; Details of headings

BORE 168 ft. ; diameter of bore : at top 4 ins. ; at bottom 4 ins.

Details of permanent lining tubes Tubes sunk to a depth of 145' 7"

Water struck at depths of 148 ft. below well-top.

TEST CONDITIONS

Rest-level of water 55 ft. ~~above~~ below well-top. Suction at 76 ft. Yield on 3 ~~hours~~ days' test pumping at 250 galls. per hour with depression to nil ft. below well-top.

Recovery to rest-level in immediate mins. hours Capacity of pump 350 g.p.h. Date of measurements 16/8/50

NORMAL CONDITIONS

Description of permanent pumping equipment :

Make and/or type Godwin Type 4V Motive power Petrol driven

Capacity 350 gallons per hour. Suction at 76 ft.

Amount pumped 500 galls. per day. Estimated consumption 3500 galls. per week.

Well made by Folkard & Baker Date of well 16/8/50

Information from Folkard & Baker Main Rd. Hethersett, Norfolk.

ADDITIONAL NOTES

Sand screened test applied at 83 ft.

Not sufficient yield

Site [illegible] Folkard & Baker on Norfolk 97 [illegible]

Water [illegible] for [illegible] 500 g.p. daily [illegible]

and used to pump. Petrol engine. Bore [illegible]

for [illegible]

3.9.60 G.S.M.

A. & E.W.Ltd. Gp.685

(*36243) W1

GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.

Date Received	1" O.S. Map No.	Site Marked (use symbol) on 1" Map	on 6" Map
18.9.50			⊙

(For Survey use only) Geological Classification	Nature of Strata — If measurements start below ground surface, state how far ...	Thickness Feet	Thickness Inches	Depth Feet	Depth Inches
			TM	18 NE/1	
	From Surface Level				
Chalky Boulder clay	Grey Clay	71	-	71	-
Glacial Sand & Gravel	Small Shell & Stone	12	-	83	-
	Gravel	21	-	104	
Upper Chalk OTW 1/80	Chalk struck at 104ft below surface level				

.74' (422.55)

RECORD OF WELL (SHAFT OR BORE)

(attach copy of analysis if available)

For Survey use only
N.3576
TM18/64
175/392

TM1793 8883

EXACT SITE OF WELL

At Willow Farm

Great Hockham

Town or Village ~~Great Hockham~~

County Norfolk Six-inch quarter sheet 97 SW/W

For Mr. T. Wilson State whether owner, tenant, builder, contractor, consultant, etc. :— Owner

Address (if different from above)

Level of ground surface above sea-level (O.D.) c +178 ft. If well-top is not at ground level, state how far ... above; ... below; ... ft.

SHAFT ... ft.; diameter ... ft.; Details of headings ...

BORE 168 ft.; diameter of bore: at top 4 ins.; at bottom 4 ins.

Details of permanent lining tubes Tubes sunk to a depth of 145' 7"

Water struck at depths of 148 ft. below well-top.

TEST CONDITIONS

Rest-level of water 55 ft. ~~above~~ below well-top. Suction at 76 ft. Yield on 3 ~~hours~~ days' test pumping at 250 galls. per hour with depression to nil ft. below well-top.

Recovery to rest-level in immediate mins. hours Capacity of pump 350 g.p.h. Date of measurements 16/8/50

NORMAL CONDITIONS

Description of permanent pumping equipment:

Make and/or type Godwin Type AV. Motive power Petrol driven

Capacity 350 gallons per hour. Suction at 76 ft.

Amount pumped 500 galls. per day. Estimated consumption 3500 galls. per week.

Well made by Folkard & Baker Date of well 16/8/50

Information from Folkard & Baker Main Rd. Hethersett, Norfolk.

ADDITIONAL NOTES

Sand screened test applied at 83ft

Not sufficient yield

Sited by Folkard & Baker on Norfolk 97 SW/W.

Visited. In use for farm 500 g.p. day. 30.11.50. ATW.
Takes over an hour to pump. Petrol engine. Bore inaccessible for measurement.
OD + c 178. 3.9.60 ASR.

LOG OF STRATA OVERLEAF. Norfolk REC file WS 1140/1168

GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.		Date Received	1" O.S. Map No.	Site marked (use symbol) on 1" Map	on 6" Map
		18.9.50		⊙	⊙

(*35243) Wt.44731/0424 12,000 8/48 A.& E.W.Ltd. Gp.685

(For Survey use only) Geological Classification	NATURE OF STRATA If measurements start below ground surface, state how far ...	Thickness Feet	Thickness Inches	Depth Feet	Depth Inches
	From Surface Level				
Chalky Boulder Clay →	Grey Clay	71	-	71	-
Glacial Sand & Gravel →	Small Shell & Stone	12	-	83	-
	Gravel	21	-	104	
Upper Chalk CJW 1/80	Chalk struck at 104ft. below surface level				

175/392

TM18/64

Chalky Boulder Clay	71
Glacial Sand & Gravel	104
Upper Chalk	

CW
4/80

RECORD OF WELL (SHAFT OR BORE)

TM 1641 8894

For Survey use only
N. 8226
175/495
Licence No. 91222/16/3070

EXACT SITE OF WELL

At Broadgate Way
Broadgate Lane.
Town or Village Gt Moulton
County Norfolk Six-inch quarter sheet 96 SE/E
For Mr. E. Alexander State whether owner, tenant, builder, contractor, consultant, etc.:—
Address (if different from above) as above. TM 18 NE/10
Level of ground surface above sea-level (O.D.) ? c 180 ft. No bench marks.
If well-top is not at ground level, state how far { above: / below; } ft.
SHAFT ft.; diameter ft.; Full details of headings (dimensions and directions)

BORE 110 ft.; diameter of bore: at top 4 ins.; at bottom 4 ins.
Full details of permanent lining tubes (position, length, diameter, plain, slotted etc.)
~~110~~ 116 ft of 4" galvanised

Water struck at depths of ft. below well-top.

TEST CONDITIONS

Rest level of water 33 ft. ~~above~~ below well-top. Suction at ft. Yield on 8 hours' ~~days~~ test
pumping at ~~500 600~~ galls. per Hour with depression to 38 ft. below well-top.
Recovery to rest-level in 7 mins. ~~hours~~ Capacity of pump g.p.h. Date of measurements July 19 57.

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:
Make and/or type Climax Fig 8 deep well lift & force hand pump Motive power By Hand.
Capacity gallons per hour. Suction at ft.
Amount pumped galls. per day. Estimated consumption 3500 galls. per week.
Well made by E. Page Date of well June 1957
Information from 316 Sprowston Rd Norwich

ADDITIONAL NOTES

ANALYSIS (please attach copy if available)

To be taken by the Depwade R.D.C.
Sample highly satisfactory.

Sited by ⊙ on 6" Norfolk 96 SE/E. ME 30/8/57
Visited. In use for house + green houses. c200 g.p. day used. Handpump in position. Inaccessible for measurement.
Owner Mr. R.R. Barnes.
OD + c. 180
3.9.60 AHR.

LOG OF STRATA OVERLEAF.

Geological Survey and Museum, South Kensington, London, S.W.7.		Section 6.	Date Received	1" O.S. Map No.	Site marked on 1" Map	(use symbol) on 6" Map
			12.8.57.		⊙	⊙

(1527) Dd574/W137583 12,000 8/54 JC&S Gp669

TM18/162

RECORD OF WELL (SHAFT OR BORE)

TM 1641 8894

For Survey use only
N. 8226
175/495
Licence No. 91222/16/3070

EXACT SITE OF WELL
At BROADGATE WAY
Broadgate Lane.
Town or Village GT. MOULTON
County NORFOLK
Six-inch quarter sheet 96 SE/E
For MR. E. ALEXANDER
State whether owner, tenant, builder, contractor, consultant, etc.:—
Address (if different from above) as above
Level of ground surface above sea-level (O.D.) ? c180 ft. No bench marks.
If well-top is not at ground level, state how far {above: below; ...ft.
SHAFT ...ft.; diameter ...ft.; Full details of headings (dimensions and directions)

BORE 140 ft.; diameter of bore: at top 4 ins.; at bottom 4 ins.
Full details of permanent lining tubes (position, length, diameter, plain, slotted etc.)
~~140~~ 116 ft of 4" galvanised

Water struck at depths of ...ft. below well-top.

TEST CONDITIONS
Rest level of water 33 ft. ~~above~~ below well-top. Suction at ...ft. Yield on 8 hours' ~~days'~~ test
pumping at 500 ~~600~~ galls. per HOUR with depression to 38 ft. below well-top.
Recovery to rest-level in 7 mins. ~~hours~~ Capacity of pump ...g.p.h. Date of measurements July 1957.

NORMAL CONDITIONS
DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:
Make and/or type Climax Fig 8 deep well lift & force hand pump Motive power By Hand.
Capacity ...gallons per hour. Suction at ...ft.
Amount pumped ...galls. per day. Estimated consumption 3500 galls. per week.
Well made by J. W. Page Date of well June 1957
Information from 316 Sprowston Rd, Norwich

ADDITIONAL NOTES

ANALYSIS (please attach copy if available)

To be taken by the Depwade R.D.C.
Sample highly satisfactory.

Sited by ⊙ on 6" Norfolk 96 SE/E. AR 29/8/57
Visited. In use for house + green houses. c200 g.p. day used. Handpump in position. Inaccessible for measurement.
Owner Mr. R.R. Barnes.
OD + c.180
3.9.60 AHR.

LOG OF STRATA OVERLEAF.

Geological Survey and Museum, South Kensington, London, S.W.7.		Section 6.	Date Received	1" O.S. Map No.	Site marked on 1" Map	(use symbol) on 6" Map
			12.8.57.		⊙	⊙

(1527) Dd574/Wt37583 12,000 8/54 JC&S Gp669

2

(For Survey use only) Geological Classification	NATURE OF STRATA If measurements start below ground surface, state how far ..	Thickness Feet	Thickness Inches	Depth Feet	Depth Inches
	Top Soil	1	—	1	—
	Yellow Clay	11	—	12	—
	Blue clay with Chalk Stones	63	—	75	—
	Gravel	13	—	88	—
	Chalk	52	—	140	—

3

TM18/162 N.8226
175 91222
/16
/3090
/495

MINISTRY OF HOUSING AND LOCAL GOVERNMENT

WATER ACT, 1945

LICENCE

to construct works in the area defined in the Norfolk and Suffolk Area (Conservation of Water) Order, 1956 made under section 14(1) of the Water Act, 1945

THE MINISTER OF HOUSING AND LOCAL GOVERNMENT, on the application of Mr. E. Alexander of Great Moulton and in pursuance of his powers under section 14(6) of the Water Act, 1945, hereby licenses the said Mr. E. Alexander, to execute the work of sinking a borehole 4 inches in diameter to a depth of 160 feet at Broadgate Way, Great Moulton, Norfolk the situation of which is more particularly shown in the plan annexed hereto and thereon marked Θ, subject to the condition that the maximum quantity of water to be abstracted from the borehole in any one day of 24 hours shall be 500 gallons.

GIVEN under the Official Seal of the Minister of Housing and Local Government this Ninth day of May 1957

L.S.

W. A. WOOD

Assistant Secretary,
Ministry of Housing and Local Government.

KK 4.7.57

The attention of the licensee is drawn to subsection (8), (9), (10) and (12) of Section 14 of the Water Act, 1945, which are as follows:-

14(8) Any person who contravenes any of the foregoing provisions of this section or any requirements imposed thereunder or any condition attached to a licence granted for the purposes of subsection (3) or subsection (5) of this section shall be guilty of an offence against this Act.

(9) No person shall in any area to which this section applies -

(a) cause or allow any underground water to run to waste from any well, borehole or other work except for the purpose of testing the extent or quality of the supply or cleaning, sterilising, examining or repairing the well, borehole or other work; or

(b) abstract from any well, borehole, or other work water in excess of his reasonable requirements;

Provided that, where underground water interferes or threatens to interfere with the execution or operation of any underground works (whether waterworks or not), it shall not be an offence under this subsection to cause or allow the water to run to waste so far as may be necessary to enable the works to be executed or operated if no other method of disposing of the water is reasonably practicable.

(10) A person who contravenes any provision of the last foregoing subsection shall, in respect of each offence, be liable on summary conviction to a fine not exceeding ten pounds and the court may, on the conviction of any person, order that the well, borehole or other work shall be effectively sealed or may make such other order as appears to the court to be necessary to prevent waste of water.

If any person fails to comply with any such order of the court the court may (without prejudice to the imposition of any penalty for contempt of court), on the application of any local authority within whose county or district the well, borehole or other work is situated or of any statutory water undertakers affected or likely to be affected by the waste, authorise the authority or undertakers to take such steps as may be necessary to execute the order, and any expense incurred in taking any such steps shall be recoverable as a civil debt from the person convicted.

(12) Any officer of a local authority whose county or district is comprised wholly or partly in an area to which this section applies, and any officer of any statutory water undertakers likely to be affected by any failure to enforce the provisions of this section in any such area, being an officer authorised for the purpose by the local authority or undertakers concerned shall, on producing, if so required, some duly authenticated document showing his authority, have a right at all reasonable hours -

(a) to enter any premises in the area for the purpose of ascertaining whether there is, or has been, on or in connection with the premises any contravention of the provisions of this section; or

(b) to enter any premises in which the authority or undertakers have been authorised to execute an order of the court made under subsection (10) of this section, for the purpose of executing that order:

and the section of this Act relating to entry of premises shall apply to any such right of entry.

Attention is also drawn to Section 7 of the Act which requires that any person who proposes to sink, for the purpose of searching for or abstracting water, a well or borehole intending to reach a depth of more than 50 feet below the surface shall, inter alia, before he begins to do so give notice to the Geological Survey and shall keep a journal of the progress of the work, and send a complete copy of it to the Survey. For more detailed and precise information on this subject, the licensee is referred to the pamphlet "Notification of New Wells and Boreholes for Water", obtainable from the Director, Geological Survey and Museum, Exhibition Road, South Kensington, S.W.7.

W25.2.16/57/1650

SB

175/495

TM18/62

MINISTRY OF HOUSING & LOCAL GOVERNMENT

Section 14 of the Water Act 1945

Licence No. L/31/664

The Norfolk and Suffolk Area (Conservation of Water) Order 1956

In this licence:-

(a) "the Minister" means the Minister of Housing and Local Government;

(b) a group of two letters and eight figures represents the map co-ordinates of the position of the borehole which is the subject of this licence, estimated to the nearest ten metres on the grid of the national reference system used by the Ordnance Survey on its maps and plans.

The Minister, in exercise of his powers under section 14(6) of the Water Act 1945, hereby licenses Mr. R. R. Barnes to carry out works for the purpose of abstracting additional underground water from the existing borehole at Broadgate Way, Great Moulton, Norfolk, national grid reference TM/16408890, subject to the following conditions:-

1. The depth of the borehole shall not exceed 140 feet.

2. The capacity of the pump to be installed for abstracting water from the borehole shall not exceed 500 gallons per hour.

3. Except with the consent of the Minister given after like proceedings with respect to the publication and service of notices, and the making and hearing of objections, as apply to applications for licences under section 14(6) of the Water Act 1945, not more than 4,000 gallons of water shall be abstracted from the borehole in any one day of 24 hours.

4. If the work is not constructed within one year from the date of this licence, the licence shall cease to have effect.

GIVEN under the Official Seal of the

Minister of Housing and Local Government

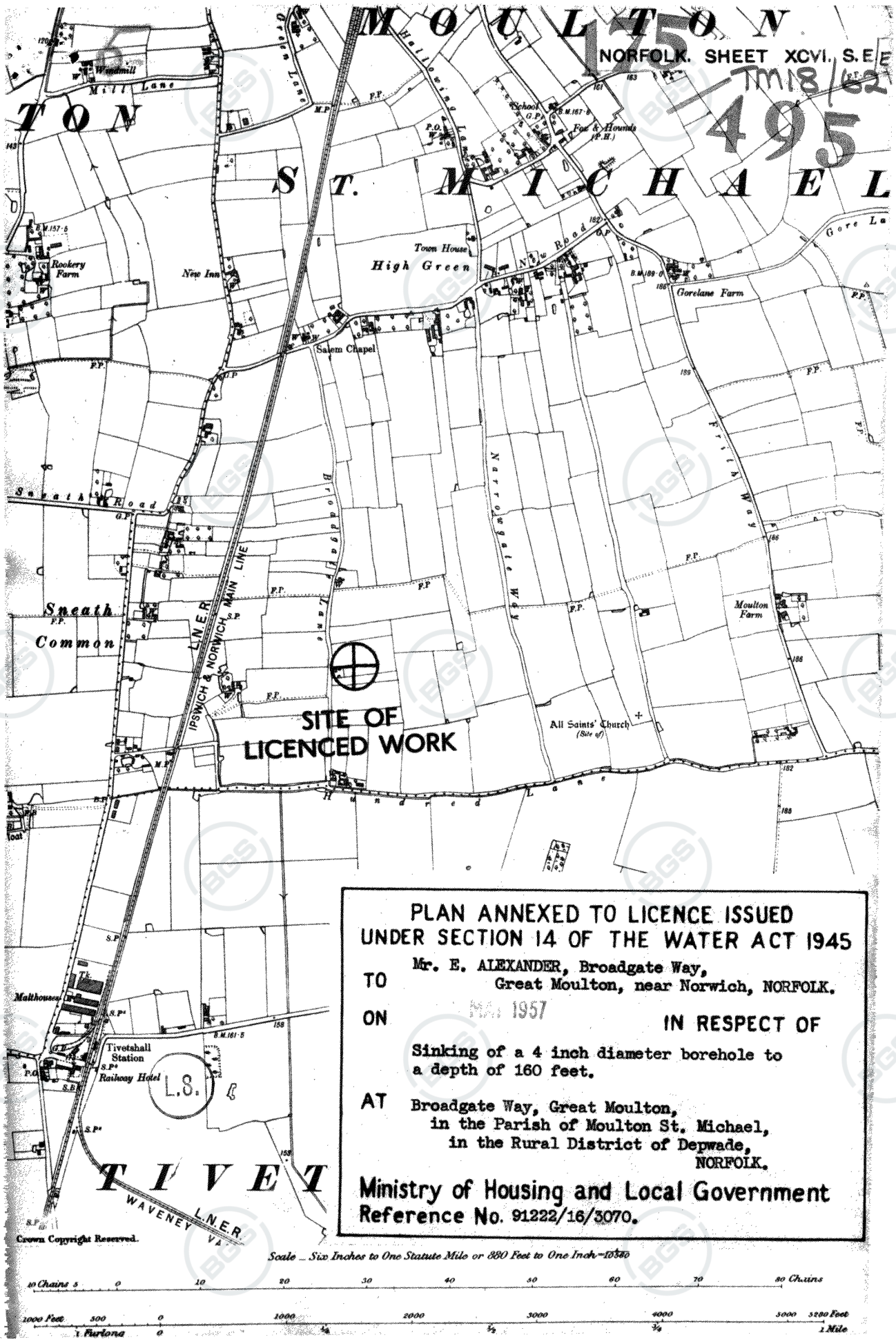
on 25th November 1964.

H. J. RYAN
Assistant Secretary

Ministry of Housing and Local Government

N.B. UNDER THE WATER ACT 1945, IT IS AN OFFENCE PUNISHABLE BY FINE TO CONTRAVENE ANY CONDITION ATTACHED TO THIS LICENCE.

BGS ID: 563396 : BGS Reference: TM18NE10
British National Grid (27700) : 616410,288940



BGS ID: 563396 : BGS Reference: TM18NE10
British National Grid (27700) : 616410,288940

175/425

TM18/62

	Depth (ft.)
Chalky Boulder Clay	75
? Glacial sand & gravel	88
Upper Chalk	140

CW
1/80

RECORD OF WELL (SHAFT OR BORE)

(attach copy of analysis if available)

For Survey use only
N. 7640

175/446

TM 18 NE/13

EXACT SITE OF WELL

At Wood Farm
TM 1997 8941

Town or Village Pulham Market

County Norfolk

Six-inch quarter sheet 97 SW/W

For Mr. Thacker

State whether owner, tenant, builder, contractor, consultant, etc. :— Owner

Address (if different from above)

Level of ground surface above sea-level (O.D.) 180 549 ft.

If well-top is not at ground level, state how far ... {above; below; ft.

SHAFT ft.; diameter ft.; Details of headings

BORE 181 ft.; diameter of bore: at top 4 ins.; at bottom ins.

Details of permanent lining tubes

Water struck at depths of ft. below well-top.

TEST CONDITIONS

Rest-level of water 67 ft. ~~above~~ below well-top. Suction at ft. Yield on hours' days' test

pumping at galls. per with depression to ft. below well-top.

Recovery to rest-level in mins. hours Capacity of pump g.p.h. Date of measurements

NORMAL CONDITIONS

Description of permanent pumping equipment:

Make and/or type Evans 6" power head Motive power Lister petrol engine.

Capacity gallons per hour. Suction at ft.

Amount pumped galls. per day. Estimated consumption 600 galls. per ~~week~~ day

Well made by T. W. PAGE. Date of well Dec. 1950

Information from Sprowston Rd. Norwich.

ADDITIONAL NOTES

Sited by ⊙ on 6" map Norfolk 97 SW/W.
Info from Agric. file WS 1356/101. 9.12.54 Rox + CFH.

In use Pump as described above supplies 300 gall tank. Bore [illegible] for water level measurement 4" tubes at surface.

Visited & sited on 97 SW/W [illegible] 24-8-60

LOG OF STRATA OVERLEAF.

Geological Survey and Museum, South Kensington, London, S.W.7.	Date Received	1" O.S. Map No.	Site marked on 1" Map	(use symbol) on 6" Map
	9.12.54		⊙	⊙

(*35243) Wt.44731/0424 12,000 3/48 A.& E.W.Ltd. Gp.685

BGS ID: 563399 : BGS Reference: TM18NE13
British National Grid (27700) : 619970,289410

(For Survey use only) Geological Classification	Nature of Strata. If measurements start below ground surface, state how far ...	Thickness Feet	Thickness Inches	Depth Feet	Depth Inches
			TM	18	NE/13
Chalky Boulder Clay	Yellow clay	14	—	14	—
	Blue clay	50	—	64	—
	Grey sand	4	—	68	—
Glacial Sand + Gravel + ? Clay	Grey clay & sand	32	—	100	—
	Black sand & stone	20	—	120	—
Upper Chalk CJW 1/80	Chalk	61	—	181	—

19·5
77 30·5
NCg
36·6

RECORD OF WELL (SHAFT OR BORE)
(attach copy of analysis if available)

For Survey use only
N. 7640
TM 18/140
TM 28/1

EXACT SITE OF WELL
At Vic. Farm
1997
TM 2000 8941
Town or Village PULHAM MARKET.
County NORFOLK. Six-inch quarter sheet 97 SW/W
For Mr. THACKER. State whether owner, tenant, builder, contractor, consultant, etc. :— Owner
Address (if different from above)
Level of ground surface above sea-level (O.D.) c.180 ft. If well-top is not at ground level, state how far ... {above; below; ft.
SHAFT ft.; diameter ft.; Details of headings
BORE 181 ft.; diameter of bore: at top 4 ins.; at bottom ins.
Details of permanent lining tubes
Water struck at depths of ft. below well-top.

TEST CONDITIONS
Rest-level of water 67 ft. ~~above~~ below well-top. Suction at ft. Yield on hours' days' test
pumping at galls. per with depression to ft. below well-top.
Recovery to rest-level in mins. hours Capacity of pump g.p.h. Date of measurements

NORMAL CONDITIONS
Description of permanent pumping equipment:
Make and/or type Evans 6" power head Motive power Motor petrol engine.
Capacity gallons per hour. Suction at ft.
Amount pumped galls. per day. Estimated consumption 600 galls. per ~~week~~ day.

Well made by T. W. PAGE. Date of well
Information from SPROWSTON RD. NORWICH.

ADDITIONAL NOTES

Sited by O on 6" map Norfolk 97 SW, W.
Inf. Norfolk AEC. file W2 1556/1/1. 9.12.54 RCK + CFH.

In use Pump as described above supplies 300 gall tank Bore inacc for water level measurement 4" tube at surface
Visited & sited on 97 SW/W [illegible] 24-8-60

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.	Date Received	1" O.S. Map No.	Site marked on 1" Map	(use symbol) on 6" Map
	9.12.54		⊙	⊙

(*35243) Wt.44731/0424 12,000 3/48 A.& E.W.Ltd. Gp.685

BGS ID: 563399 : BGS Reference: TM18NE13
British National Grid (27700) : 619970,289410

(For Survey use only) Geological Classification	Nature of Strata. If measurements start below ground surface, state how far ...	Thickness Feet ...	Thickness Inches ...	Depth Feet	Depth Inches
Chalky Boulder Clay	Yellow Clay	14	–	14	–
	Blue clay	50	–	64	–
Glacial Sand + Gravel	Grey sand	4	–	68	–
	Grey clay & sand	32	–	100	–
Upper Chalk CJW 1/80	Black sand & stone	20	–	120	–
	Chalk	61	–	181	–

175/446

~~TM28/1~~
TM18/140

	Depth (ft.)
Chalky Boulder Clay	64
Sand, gravel, unclassified	120
Upper Chalk	184

CW
1/80

N.G.R. TM. 1746 8914

RECORD OF WELL (SHAFT OR BORE)

For Survey use only
N. 6639

175/461

Licence No.

EXACT SITE OF WELL

At THE [illegible] Farm
TM 1746 8914

Town or Village [illegible]

County [illegible] Six-inch quarter sheet [illegible]

For H J [illegible] State whether owner, tenant, builder, contractor, consultant, etc.:— [illegible]

Address (if different from above) TM 18 NE/14

Level of ground surface above sea-level (O.D.) (55.47) +182 ft. If well-top is not at ground level, state how far .. above: below; ft.

SHAFT [illegible] ft.; diameter ft.; Full details of headings (dimensions and directions)

BORE [illegible] ft.; diameter of bore: at top [illegible] ins.; at bottom 4 ins.

Full details of permanent lining tubes (position, length, diameter, plain, slotted etc.) [illegible]

Water struck at depths of ft. below well-top.

TEST CONDITIONS

Rest level of water [illegible] ft. above/below well-top. Suction at ft. Yield on 6 hours'/days' test pumping at [illegible] galls. per with depression to ft. below well-top.

Recovery to rest-level in mins./hours Capacity of pump g.p.h. Date of measurements

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Motive power

Capacity gallons per hour. Suction at ft.

Amount pumped galls. per day. Estimated consumption galls. per week.

Well made by [illegible] Date of well [illegible]

Information from [illegible]

ADDITIONAL NOTES

ANALYSIS (please attach copy if available)

Sited by ⊙ on 6" map Norfolk 96 SE/E.

Visited. In use 400 g.p.day for farm & house. Bore inaccessible for measurement. Water very ferruginous.

OD. +182.

3.9.60 AJR.

LOG OF STRATA OVERLEAF.

Geological Survey and Museum, South Kensington, London, S.W.7.		Section 6.	Date Received	1" O.S. Map No.	Site marked on 1" Map	(use symbol) on 6" Map
			9.12.54		⊙	⊙

(1527) Dd574/W137583 12,000 8/54 JC&S Gp669

TM 18 NE/14

(For Survey use only) Geological Classification	Nature of Strata. If measurements start below ground surface, state how far ..	Thickness Feet	Thickness Inches	Depth Feet	Depth Inches
	Soil	6		6	
Glacial Sand & Gravel	Red Sand (+25.04)	24		90	27.43
Crag	Shelly sand - hard (+23.77)	14	(4.27)	104	31.70
Upper Chalk CZW 1/80	Chalk	6		110	

N.G.K. TM. 1746 8914 - 1M18/65

- 1 -

RECORD OF WELL (SHAFT OR BORE)

For Survey use only

N. 6639

175/461

Licence No.

EXACT SITE OF WELL

At THE WOODLANDS FARM

TM 1746 8914

Town or Village Great Moulton

County Norfolk. Six-inch quarter sheet 96 SE/E

For H.J. Cable State whether owner, tenant, builder, contractor, consultant, etc.:— owner

Address (if different from above)

Level of ground surface above sea-level (O.D.) +182 ft. If well-top is not at ground level, state how far .. { above: / below; ft.

SHAFT 65 ft.; diameter ft.; Full details of headings (dimensions and directions)

BORE 105 ft.; diameter of bore: at top 4 ins.; at bottom 4 ins.

Full details of permanent lining tubes (position, length, diameter, plain, slotted etc.)

Lined 130 fr. to surface (26' in to chalk)

Water struck at depths of ft. below well-top.

TEST CONDITIONS

Rest level of water 49 ft. ~~above~~ below well-top. Suction at ft. Yield on 6 hours' ~~days'~~ test pumping at 700 galls. per with depression to ft. below well-top.

Recovery to rest-level in mins. / hours Capacity of pump g.p.h. Date of measurements

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Motive power

Capacity gallons per hour. Suction at ft.

Amount pumped galls. per day. Estimated consumption galls. per week.

Well made by F.H.V. Hewson. N. Hopham, Diss Date of well 7.8.53.

Information from Norfolk AEC file W123/170. 9.12.54 Rok ~ REA.

ADDITIONAL NOTES

ANALYSIS (please attach copy if available)

Sited by ⊙ on 6" map Norfolk 96 SE/E.

Visited. In use 400 g.p.day for farm + house. Bore inaccessible for measurement. Water very ferruginous.

OD. +182. 3.9.60 AJR.

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.		Section 6.	Date Received 9.12.54	1" O.S. Map No.	Site marked on 1" Map ⊙	(use symbol) on 6" Map ⊙

(1527) Dd574/W137588 12,000 8/54 JC&S Gp669

BGS ID: 563400 : BGS Reference: TM18NE14
British National Grid (27700) : 617460,289140

(For Survey use only) Geological Classification	Nature of Strata. If measurements start below ground surface, state how far ..	Thickness Feet ..	Thickness Inches ..	Depth Feet	Depth Inches
	Well	65		65	
Glacial Sand + Gravel	Red Sand	25		90	
Crag	Grey Sand - Shells	14		104	
Upper Chalk CZW 1/80	Chalk	66		170	

BGS ID: 563400 : BGS Reference: TM18NE14
British National Grid (27700) : 617460,289140

175/461
TM18/63

	Depth (ft.)
Dug well	65
Glacial sand & gravel	90
Crag	104
Upper chalk	170

CW
1/00

TM18NE/34

EASTERN L.S

ANGLIAN E.A.

RECORD OF WELL

For Institute use only Licence No. N 960060

Tm 18/134

175 TM 18 NE

At ELM TREE FARM
TIVETSHALL ST MARGARET
Town or Village NORWICH
County NORFOLK

EXACT SITE OF WELL

Six-inch National Grid sheet and reference TM 177 888
For ROBERT SIDNEY BURTON
State whether owner, tenant, builder, contractor, consultant, etc.: OWNER
Address (if different from above) AS ABOVE

Level of ground surface above sea level (O.D.) 183 ft (55.7 m)

*DELETE AS NECESSARY

If well top is not at ground level state how far above/below: ...... ft (...... m)
SHAFT ...... ft (...... m); diameter ...... ft (...... m);
HEADINGS (please attach details—dimensions and directions)
BORE 180 ft (54.8 m); diameter: at top 6" in (152 mm);
at bottom 6" in (152 mm)
Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):
WELDED STEEL TUBE 135 ft 41.14 m
PLAIN BORED 45 13.71 m

Water struck at depths of ...... ft (...... m) below well top

TEST CONDITIONS

Rest level of water 60 ft (...... m) ~~above~~* below well top. Suction at ...... ft (...... m)
Yield on 4 hours* ~~days~~* test pumping at 1100 galls per HOUR (...... l/s) with
depression to 103 ft (...... m) below well top. Recovery to rest level in ...... mins*/hours
Capacity of pump ...... g.p.h. (...... l/s)
Date of measurements SEPT 96

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:
Make and/or type DAB SB17M Motive power 240 VOLTS
Capacity ...... galls (...... m³) per hour. Suction at ...... ft (...... m)
below well top. Amount pumped ...... galls (...... m³) per day. Estimated
consumption ...... galls (...... m³) per week
Well made by PANKS ENGINEERS Date of sinking SEPT 96

LOG OF STRATA OVERLEAF

ADDITIONAL NOTES ~~ANALYSIS~~ (please attach copy if available)

RECEIVED N.G.D.C.
DATE: 26-9-97
SIG: [redacted]

Received from PANKS ENGINEERS
Date 17/6/97
Observation well ......
Recorder ......
ER log ......
Site marked on:
1" map ......
6" map—Grid Sheet ......
(use symbol)
Copy to ......
Date ......

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2494 10000 7/79

NGDC ACCESSION NUMBER 29138

BGS ID: 563420 : BGS Reference: TM18NE34
British National Grid (27700) : 617700,288800

For Institute use only — Geological Classification	NATURE OF STRATA *If measurements start below ground surface, state how far.*	Thickness Feet	Thickness Inches	Thickness Metres	Depth Feet	Depth Inches	Depth Metres
	CLAY	96	00		96	00	
	SAND	9	00		105	00	
	CHALK	75	00		180	00	
				T.D	54	8m	

EASTERN L.S

ANGLIAN E.A.

RECORD OF WELL

For Institute use only Licence No. N 960060

At BELL TRAK FARM
TIVETSHALL ST MARGARET
Town or Village NORWICH
County NORFOLK

TM 18/134
175
TM 18/NE

EXACT SITE OF WELL

Six-inch National Grid sheet and reference TM 177 888

For ROBART SIDNEY BURTON

State whether owner, tenant, builder, contractor, consultant, etc.: OWNER

Address (if different from above) AS ABOVE

Level of ground surface above sea level (O.D.) 188 ft (55.7 m)

*DELETE AS NECESSARY

If well top is not at ground level state how far above:* below: ft (m)

SHAFT ft (m); diameter ft (m);

HEADINGS (please attach details—dimensions and directions)

BORE 180 ft (54.8 m); diameter: at top 6" in (152 mm);
at bottom 6" in (152 mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

WARNED STEEL TUBE 135 FT 41.14m
PLAIN BORED 45 13.71m

Water struck at depths of ft: (m) below well top

TEST CONDITIONS

Rest level of water 60 ft (m) above* below well top. Suction at ft (m)

Yield on 4 hours* days* test pumping at 1100 galls per HOUR (l/s) with

depression to 103 ft (m) below well top. Recovery to rest level in mins* hours

Capacity of pump g.p.h. (l/s)

Date of measurements SEPT 96

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type DAB SB 1.7 M Motive power 240 VOLTS

Capacity galls (m³) per hour. Suction at ft (m)

below well top. Amount pumped galls (m³) per day. Estimated

consumption galls (m³) per week

Well made by PANKS ENGINEERS Date of sinking SEPT 96

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF STRATA OVERLEAF

Received from PANKS ENGINEERS
Date 12/6/97
Observation well
Recorder
ER log
Site marked on
1" map
6" map—Grid Sheet
(use symbol)
Copy to
Date

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

BGS 5491 10 000 7/79

BGS ID: 563420 : BGS Reference: TM18NE34
British National Grid (27700) : 617700,288800

For Institute use only

Geological Classification	Nature of Strata *If measurements start below ground surface, state how far.*	Thickness Feet	Inches	Metres	Depth Feet	Inches	Metres
	CLAY	96	00		96	00	
	SAND	9	00		105	00	
	CHALK	75	00		180	00	
				T.D	54	8m	

FORM WR-39/4

National Rivers Authority
..... Region

PUMPING TEST DATA

TM18/134

CONTINUATION SHEET

CONSENT NO.	7-34-18-P1898
Pumping test at	RUE TREE FARM TIVETSHALL
NGR	TM 177 888
Observations from	
NGR	

Description of datum point from which measurements were made (eg ground level, flange, dip tube/other): TOP OF CASING

Height above ground level (metres): .15M

Date	Time	Elapsed time Hours ~~Mins~~	Elapsed time ~~Days~~ HRS	Depth of water level below datum (metres)	Drawdown (metres)		Comments
16.9.96	13.00	210		31.57			
	13.30	240	4	31.59			

Use continuation sheet (WR-39/4) if necessary

Forms/96

National Rivers Authority

FORM WR-39/2

PUMPING TEST DATA

TM18/134

CONSTANT RATE PUMPING TEST - RECOVERY

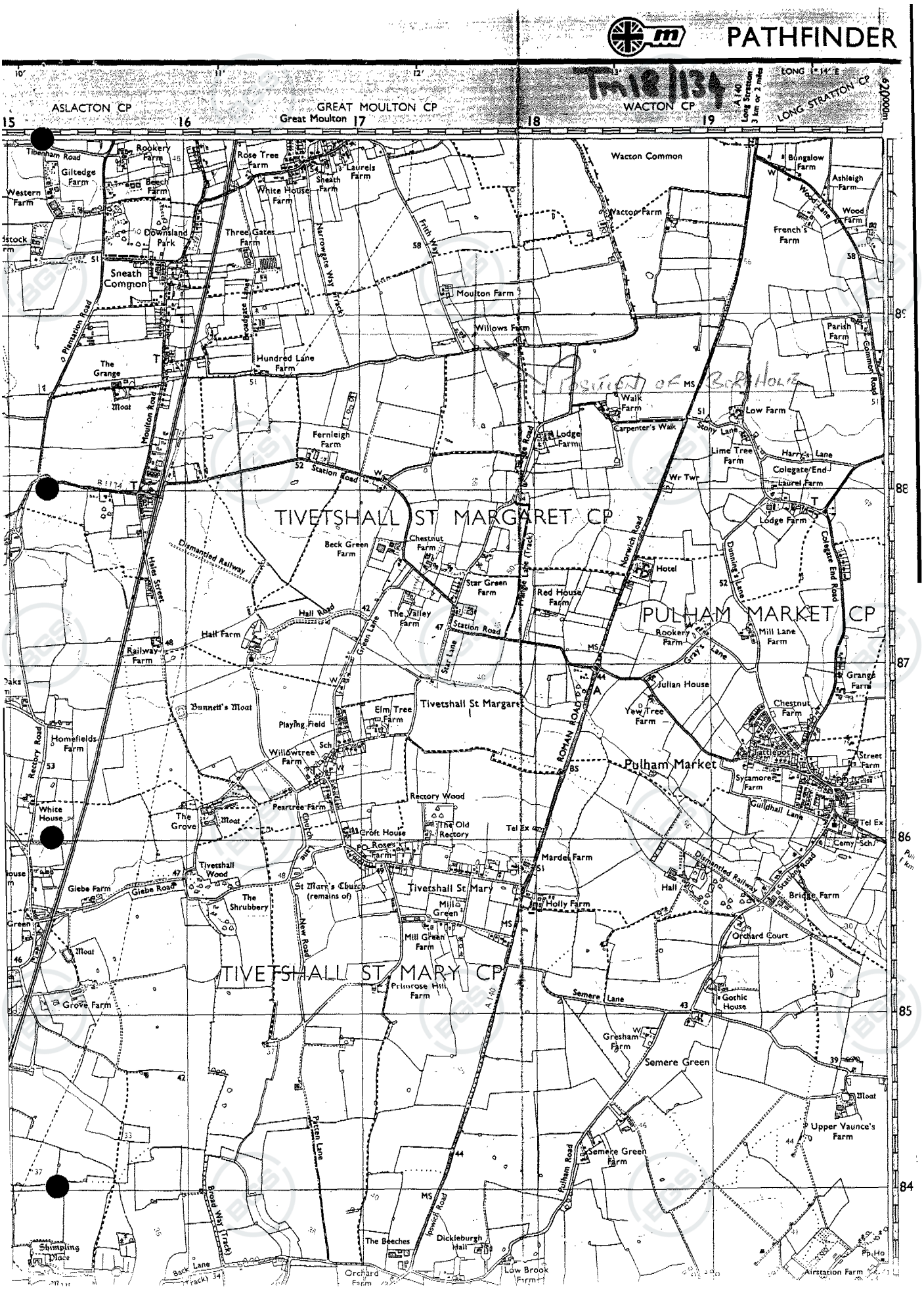
CONSENT NO.	7/34/18/P1893
Pumping test at	ELM TREE FARM
NGR	TM 177 888
Observations from	
NGR	

Description of datum point from which measurements were made (eg ground level, flange, dip tube/other): TOP OF CASING

Height above ground level (metres): 1.5 M

Date	Time	Elapsed time Minutes	Elapsed time Hours	Depth of water level below datum (metres)	Drawdown (metres)		Comments
16.9.96	13.30	0		31.59			
	13.31	1		27.82			
	13.32	2		24.68			
	13.33	3		22.80			
	13.34	4		21.65			
	13.35	5		20.81			
	13.36	6		20.28			
	13.37	7		19.93			
	13.38	8		19.68			
	13.39	9		19.50			
	13.40	10		19.38			
	13.45	15		19.06			
	13.50	20		18.91			
	13.55	25		18.81			
	14.00	30		18.75			
	14.05	35		18.70			
	14.10	40		18.66			
	14.15	45		18.63			
	14.20	50		18.61			
	14.25	55		18.59			
	14.30	60	1	18.56			
	14.40	70		18.53			
	14.50	80		18.50			
	15.00	90		18.47			
	15.10	100		18.43			
	15.30	120	2	18.37			
	16.00	150		18.34			
		180	3				
		210					
		240	4				
		300	5				

BGS ID: 563420 : BGS Reference: TM18NE34
British National Grid (27700) : 617700,288800



National Rivers Authority

FORM WR-39/1

PUMPING TEST DATA

TM18/134

CONSTANT RATE PUMPING TEST

CONSENT NO.	7-34-18-P1893
Pumping test at.	BCM TRIAL FARM TUTTSHAM
NGR	TM 177 888
Observations from	
NGR	

Description of datum point from which measurements were made (eg ground level, flange, dip tube/other): TOP OF CASING

Height above ground level (metres): .15M

Date	Time	Elapsed time Minutes	Elapsed time Hours	Depth of water level below datum (metres)	Drawdown (metres)	Meter readings (m^3) or Discharge rate (m^3/hr)	Comments (eg pump started, pumping rate changed, pump stopped)
11-9-96		DAY (-3)		18.34			
12-9-96		DAY (-2)		18.35			
13-9-96		DAY (-1)		18.34			
14-9-96	09.30	0		18.34			
	09.31	1		28.20			
	09.32	2		25.35			
	09.33	3		26.71			
	09.34	4		27.69			
	09.35	5		28.49			
	09.36	6		29.01			
	09.37	7		29.46			
	09.38	8		29.79			
	09.39	9		30.01			
	09.40	10		30.22			
	09.45	15		30.78			
	09.50	20		30.93			
	09.55	25		30.99			
	10.00	30		31.03			
	10.05	35		31.10			
	10.10	40		31.16			
	10.15	45		31.21			
	10.20	50		31.26			
	10.25	55		31.27			
	10.30	60		31.28			
	10.40	70		31.29			
	10.50	80		31.30			
	11.00	90		31.34			
	11.10	100		31.44			
	11.30	120	2	31.51			
	12.00	150		31.53			
	12.30	180	3	31.55			

1063 Wt. 22438/0384 10M 7/45 (51) F.&S. TM 29 SW/4

RECORD OF WELL (SHAFT OR BORE)

(For Survey use only) N1107.
1-inch Map Registered No. 175/371

At The Cedars Long Stratton.

Town or Village Long Stratton.

County Norfolk Six-inch quarter sheet 87 SW/E

For Mr. M.R. Formby

Exact site of well North side of Farm on Main Road. TM 2012 9389 { Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) ~~Approx.~~ +142 (+43.3m) ft. If well-top is not at ground level, state how far ... { above; below; ft.

SHAFT ft.; diameter ft. Details of headings

BORE ft.; diameter of bore: at top 4" ins.; at bottom 3" ins. Lengths, diameters, perforations, etc., of lining tubes 4" Tube I/D

Water struck at depths, below well top, of (feet)

Rest-level of water 37 ft. above/below well-top. Suction at ft. Yield on 14 hours'/days' pumping, 300 gal. per with depression to ft. below well-top, Capacity of pump 200 g.p.h. Recovery to rest level in mins./hours Date of measurements Date of well 1946

Quality of water (*attach copy of analysis if available*)

Well made by A. Pank & Son Ltd. Castle Hill Works Norwich.

Information from

Additional notes in space overleaf.

(For Survey use only) Geological Classification	Nature of Strata	Thickness Feet	Thickness Ins.	Depth Feet	Depth Ins.
	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far				
	EARTH	1	-	1	- (0.3m)
Chalky Boulder Clay →	CLAY	40	-	41	- (12.5m)
Glacial Sand & Gravel +25.60 →	(? Beccles Beds) SAND, SHINGLE & STONES	17	-	58	(17.7m)
Upper Chalk CGW 1/80	CHALK & FLINTS	62	-	120	(36.6m)
	80ft. 4" Tubing.				
	40ft. Plain Boring.				
	In use Electric pump. Yield c 1000 gpd. Used for dairy. OD +142. Visited 3.9.60 GAW				
	Abundant supply. Pump Barrel upon 80ft. below ground level.				

1063 Wt. 22438/0384 10M 7/45 (51) F.&S. TM29 142

RECORD OF WELL (SHAFT OR BORE)

(For Survey use only) N1107.
1-inch Map Registered No. 175/371

At The Cedars Long Stratton.

Town or Village Long Stratton.

County Norfolk Six-inch quarter sheet 87 SW/E

For Mr. H.R. Formby

Exact site of well North side of Farm on Main Road. TM 2012 9389 { Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) +142 ft. If well-top is not at ground level, state how far ... { above; below; ft.

SHAFT ft.; diameter ft. Details of headings

BORE ft.; diameter of bore: at top 4" ins.; at bottom 3" ins. Lengths, diameters, perforations, etc., of lining tubes 4" Tube I/D

Water struck at depths below well top, of (feet)

Rest-level of water 37 ft. above/below well-top. Suction at ft. Yield on 14 hours'/days' pumping, 300 gal. per with depression to ft. below well-top, Capacity of pump 200 g.p.h. Recovery to rest level in mins./hours Date of measurements Date of well 1946

Quality of water (*attach copy of analysis if available*)

Well made by A. Pank & Son Ltd. Castle Hill Works Norwich.

Information from

Additional notes in space overleaf.

(For Survey use only) Geological Classification	Nature of Strata	Thickness Feet	Thickness Ins.	Depth Feet	Depth Ins.
	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far				
	EARTH	1	-		
Chalky Boulder Clay →	CLAY	40	-		
Glacial Sand & Gravel →	SAND, SHINGLE & STONES	17	-	58	
Upper Chalk CGW 1/80	CHALK & FLINTS	62	-	120	
	80ft. 4" Tubing.				
	40ft. Plain Boring.				
	In use Electric pump. Yield c 1000 gpd. daily. OD +142. Visited 3.9.60 GDW			Used fq	
	Abundant Supply Pump Barrel approx 80ft below ground level.				
	Continued over leaf				

Geological Survey and Museum, South Kensington, London, S.W.7.	Date received	Correspondence File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map	Site marked (use symbol) on 6" Map
	4/5/47		176.		O	O

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA *(Continued)*	THICKNESS Feet	THICKNESS Ins.	DEPTH Feet	DEPTH Ins.

ADDITIONAL NOTES

Abundant supply; pump barrel.

Approx. 80ft. below ground level.

TF 29 SW/5

1063 Wt. 22438/0384 10M 7/45 (51) F.&S.

RECORD OF WELL (SHAFT OR BORE)

(For Survey use only) 1-inch Map Registered No. 175 N.1284 347

At "The Hollies"

Town or Village Runcton Holme

County Norfolk Six-inch quarter sheet 97 NW/E

For Messrs F. Turner & Son.

Exact site of well TM 2112 9382 { Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea level (O.D.) c 150 ft. If well-top is not at ground level, state how far ... { above; below; ft.

SHAFT 43 ft.; diameter ft. Details of headings

BORE to 115 ft.; diameter of bore: at top ins.; at bottom ins. Lengths, diameters, perforations, etc., of lining tubes 104' of 4"

Water struck at depths below well top, of (feet) 80

Rest-level of water 53½ ft. above / below well-top. Suction at ft. Yield on hours' / days' pumping, 500 gal. per hr with depression to ft. below well-top, Capacity of pump g.p.h. Recovery to rest level in mins. / hours Date of measurements 4/11/46. Date of well Oct 1946

Quality of water (*attach copy of analysis if available*)

Well made by T. W. Page.

Information from

Additional notes in space overleaf.

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA (If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far)	THICKNESS Feet	THICKNESS Ins.	DEPTH Feet	DEPTH Ins.
	Existing well	43		43	(13·1m)
	gravel	20		63	(19·2m)
Chalky Boulder Clay? +20-17	blue clay	17		80	(24·4m)
Upper Chalk CGW 1/100	chalk	16		96	(29·3m)
	chalk & flints	19		115	(35·1m)
	Viewed Petrol pump Inaccessible			OT+146	(+44·5m)
	Visited & resited on 6" Norfolk 97 NW-E			3.9.60	GW

1

1063 Wt. 22438/0384 10m 7/45 (51) F.&S.

RECORD OF WELL (SHAFT OR BORE)

(For Survey use only) 1-inch Map Registered No. 175 N.1284 347

At "The Hollies" TM29/44

Town or Village Mauntychapel

County Norfolk Six-inch quarter sheet 97 NW/E

For Messrs F. Honor & Son.

Exact site of well TM 2112 9382 — Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea level (O.D.) c 150 ft. If well-top is not at ground level, state how far ... above; below; ft.

SHAFT 43 ft.; diameter ft. Details of headings

BORE to 115 ft.; diameter of bore: at top ins.; at bottom ins. Lengths, diameters, perforations, etc., of lining tubes 104' of 4"

Water struck at depths below well top, of (feet) 80

Rest-level of water 53½ ft. above/below well-top. Suction at ft. Yield on hours'/days' pumping, 500 gal. per hr with depression to ft. below well-top, Capacity of pump g.p.h. Recovery to rest level in mins./hours Date of measurements 4/11/46. Date of well Oct 1946

Quality of water (*attach copy of analysis if available*)

Well made by J. W. Page.

Information from

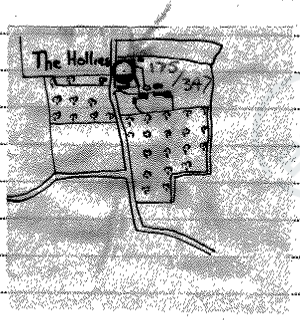
Additional notes in space overleaf.

(For Survey use only) Geological Classification	Nature of Strata	Thickness Feet	Thickness Ins.	Depth Feet	Depth Ins.
	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far				
	existing well	43		43	
	gravel	20		63	
Chalky Boulder clay?	blue clay	17		80	
Upper Chalk	chalk	16		96	
CGW 1/80	chalk & flints	19		115	
	Disused Petrol pump Inaccessible			OT+146	
	Visited & resited on 6" Norfolk 97 NW-E			3.9.60	GW

Continued over leaf

Geological Survey and Museum, South Kensington, London, S.W.7.	Date received	Correspondence File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map	Site marked (use symbol) on 6" Map
	14/7/47 VB		175	66	⊙	⊙

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA *(Continued)*	THICKNESS Feet	THICKNESS Ins.	DEPTH Feet	DEPTH Ins.



ADDITIONAL NOTES

Main bore

RECORD OF WELL

For Institute use only Licence No.
TM 29SW/16A
N.N.
175/565A
175/557(a) Site 13 Tas Valley Scheme

EXACT SITE OF WELL

At ....

Town or Village Hempnall

County Norfolk

Six-inch County Sheet 87 SW/E

Six-inch National Grid sheet and reference TM 29 SW 2253 9427

For Anglian Water Authority (Norwich Division)

State whether owner, tenant, builder, contractor, consultant, etc.:—

Address (if different from above)

Level of ground surface above sea level (O.D.) ..... ft (+ c. 38.10 m)

*DELETE AS NECESSARY

If well top is not at ground level, state how far above:* below: ..... ft (..... m)

SHAFT ..... ft (..... m); diameter ..... ft (..... m);

HEADINGS (please attach details—dimensions and directions)

BORE ..... ft (76 m); diameter: at top ..... in (20 cm); at bottom ..... in (..... cm)

Full details of permanent lining tubes (position, length, diameter, plain, slotted, etc.)
200 mm lining tube to 50 m.
(ie 34 m into the Chalk !!)

Water struck at depths of ..... ft (..... m) below well top

TEST CONDITIONS

Rest level of water ..... ft (7.85 m) ~~above*~~ below well top. Suction at ..... ft (48 m)

Yield on 25 hrs ~~hours*~~ ~~days~~ test pumping at 7700 galls (35 m³) per hr with depression to ..... ft (21.0 m) below well top. Recovery to rest level in 22 ~~mins*~~ hours

Capacity of pump ..... g.p.h. (..... m³/h)

Date of measurements 15—16 March 1976

Specific capacity 2.652 m³/h/m

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type ..... Motive power .....

Capacity ..... galls (..... m³) per hour. Suction at ..... ft (..... m) below well top. Amount pumped ..... galls (..... m³) per day. Estimated consumption ..... galls (..... m³) per week

Well made by Hewson of Mipdham Date of sinking 1976

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF STRATA OVERLEAF

Received from AWA (via Mr Parvezi of Imperial College)
Date 23.4.76
Observation well .....
Recorder .....
E.R. log .....
Site marked on
1" map .....
6" map .....
(use symbol)
Copy to .....
Date .....

INSTITUTE OF GEOLOGICAL SCIENCES,
WATER DEPARTMENT,
SOUTH KENSINGTON,
LONDON, S.W.7.

TM29SW/16

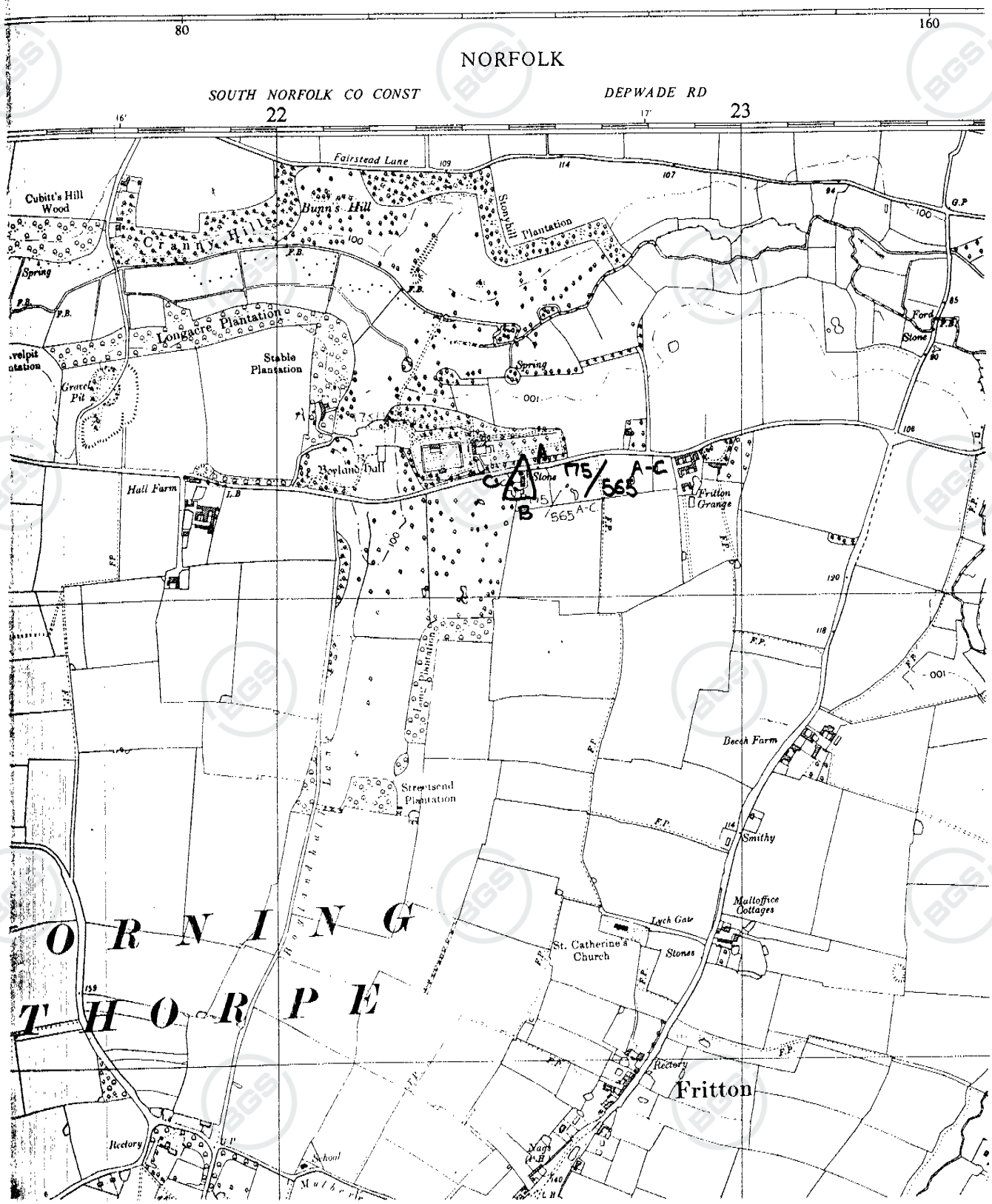
(For Institute use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far.	THICKNESS Feet	Inches	Metres	DEPTH Feet	Inches	Metre
Boulder Clay	Yellow clay			6			6
Age Uncertain	Gravel and sand with some clay			10			16
Chalk	Soft chalk and flints			60			76
CW1982	Firm chalk with some flints						

BGS ID: 565633 : BGS Reference: TM29SW16/A
British National Grid (27700) : 622530,294270

TM 29 SW/16

ORDNANCE SURVEY

Scale 1:10,560 or 6 Inches to 1 Mile



Main bore

RECORD OF WELL

For Institute use only Licence No.
TM29/172 N.N.
175/A
565
Part NW sheet TM 29 NW sent for sites
175/557(a) Site 13 Tas Valley Scheme

EXACT SITE OF WELL

At

Town or Village Hempnall

County Norfolk

Six-inch County Sheet 87 SW/E

Six-inch National Grid sheet and reference TM 29 SW 2253 9427

For Anglian Water Authority (Norwich Division)

State whether owner, tenant, builder, contractor, consultant, etc.:—

Address (if different from above)

Level of ground surface above sea level (O.D.) ft (+c. 38.10 m)

*DELETE AS NECESSARY

If well top is not at ground level, state how far above:* below: ft (m)

SHAFT ft (m); diameter ft (m);

HEADINGS (please attach details—dimensions and directions)

BORE ft (76 m); diameter: at top in (20 cm); at bottom in (cm)

Full details of permanent lining tubes (position, length, diameter, plain, slotted, etc.)
200 mm lining tube to 50 m.
(ie 34 m into the Chalk !!)

Water struck at depths of ft (m) below well top

TEST CONDITIONS

Rest level of water ft (7.85 m) ~~above~~* below well top. Suction at ft (48 m)

Yield on 25 hr ~~hours~~* ~~days~~ test pumping at 7700 galls (35 m³) per hr with depression to ft (21.0 m) below well top. Recovery to rest level in 22 ~~mins~~* hours

Capacity of pump g.p.h. (m³/h)

Date of measurements 15—16 March 1976

Specific capacity 2.652 m³/h/m

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Motive power

Capacity galls (m³) per hour. Suction at ft (m) below well top. Amount pumped galls (m³) per day. Estimated consumption galls (m³) per week

Well made by Howson of Shipdham Date of sinking 1976

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF STRATA OVERLEAF

Received from AWA (via Mr Parvez, of Imperial College)
Date 23.4.76
Observation well
Recorder
E.R. log
Site marked on
1″ map
6″ map
(use symbol)
Copy to

Date

Institute of Geological Sciences,
Water Department,
South Kensington,
London, S.W.7.

175/565A

(For Institute use only) Geological Classification	NATURE OF STRATA If measurements start below ground surface, state how far.	Thickness Feet	Inches	Metres	Depth Feet	Inches	Metre
BOULDER CLAY	Yellow clay			6			6
GLACIAL SAND & GRAVEL	Gravel and sand with some clay			10			16
UPPER CHALK	Soft chalk and flints			60			76
	Firm chalk with some flints						

P.P.
R.J. WYATT
29.3.82

RECORD OF WELL

For Institute use only Licence No.

N .....

TM29/72 A

175/585 A

At Site 13

Abstraction borehole

Town or Village Hempnall

County .....

EXACT SITE OF WELL

Six-inch National Grid sheet and reference TM 2253 9583

For .....

State whether owner, tenant, builder, contractor, consultant, etc.: .....

Address (if different from above) .....

.....

Level of ground surface above sea level (O.D.) ..... ft (..... m)

*DELETE AS NECESSARY

If well top is not at ground level state how far above:* below: ..... ft (..... m)

SHAFT..... ft (..... m); diameter..... ft (..... m);

HEADINGS (please attach details—dimensions and directions)

BORE..... ft (77 m); diameter: at top..... in (n/k mm);

at bottom..... in (..... mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

50m from surface

.....

.....

.....

Water struck at depths of ..... ft (..... m) below well top

TEST CONDITIONS

Rest level of water..... ft (c. 9 m) ~~above~~* below well top. Suction at..... ft (..... m)

Yield on..... hours'* days' test pumping at..... galls per ..... (..... l/s) with

depression to..... ft (c. 25 m) below well top. Recovery to rest level in ..... mins* hours

Capacity of pump..... g.p.h. (..... l/s)

Date of measurements.....

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type ..... Motive power.....

Capacity..... galls (..... m^3) per hour. Suction at ..... ft (..... m)

below well top. Amount pumped..... galls (..... m^3) per day. Estimated

consumption ..... galls (..... m^3) per week

Well made by ..... Date of sinking.....

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

Data from Norwich Water Division, 13.8.81

LOG OF STRATA OVERLEAF

Received from .....

.....

.....

Date .....

Observation well .....

Recorder .....

FR log .....

Site marked on

1" map .....

6" map—Grid Sheet .....

(use symbol)

Copy to .....

.....

Date .....

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2494 10 000 7/79

For Institute use only

Geological Classification	NATURE OF STRATA *If measurements start below ground surface, state how far.*	Thickness			Depth		
		Feet	Inches	Metres	Feet	Inches	Metres
	Drift			7			7
	? Crag			10			17
	Chalk			60			77

Observation bore 1

RECORD OF WELL

For Institute use only Licence No.

TM 29 SW/16a

NN

175/565 B

175/557(6) Site 13 Tas Valley Scheme

At .....

.....

Town or Village Hempnall

County Norfolk

EXACT SITE OF WELL

Six-inch County Sheet 87 SW/E

Six-inch National Grid sheet and reference TM 29 SW 2252 9424

For Anglian Water Authority (Norwich Division)

State whether owner, tenant, builder, contractor, consultant, etc.:— .....

Address (if different from above) .....

.....

Level of ground surface above sea level (O.D.) ..... ft (c. +38.10 m)

*DELETE AS NECESSARY

If well top is not at ground level, state how far above:* below: .....ft (..... m)

SHAFT.....ft (.....m); diameter.....ft (.....m);

HEADINGS (please attach details—dimensions and directions)

BORE.....ft (50 m); diameter: at top.....in (10 cm); at bottom.....in (.....cm)

Full details of permanent lining tubes (position, length, diameter, plain, slotted, etc.) .....

100 mm lining to 21 m (ie 5 m into the chalk)

.....

.....

Water struck at depths of .....ft (.....m) below well top

Rest level of water.....ft (9.11 m) ~~above~~* below well top. Suction at.....ft (..... m)

TEST CONDITIONS during pumping from (a)

Yield on..... hours'* days' test pumping at.....galls (.....m³) per..... with depression to.....ft (9.985 m) below well top. Recovery to ~~rest level~~ 9.18 m down in 22 ~~mins~~* hours

Capacity of pump .....g.p.h. (.....m³/h)

Date of measurements 15–16 March 1976

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type..... Motive power.....

Capacity.....galls (.....m³) per hour. Suction at.....ft (..... m) below well top. Amount pumped.....galls (.....m³) per day. Estimated consumption.....galls (.....m³) per week

Well made by Hewson of Shipdham Date of sinking 1976

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

Distance from (a) is 30 m.

LOG OF STRATA OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES,
WATER DEPARTMENT,
SOUTH KENSINGTON,
LONDON, S.W.7.

Received from AWA (via MK Parnaj of Imperial College)

Date 23.4.76

Observation well ✓

Recorder.....

E.R. log .....

Site marked on

1" map .....

6" map .....

(use symbol)

Copy to .....

.....

Date .....

TM 29 SW/16

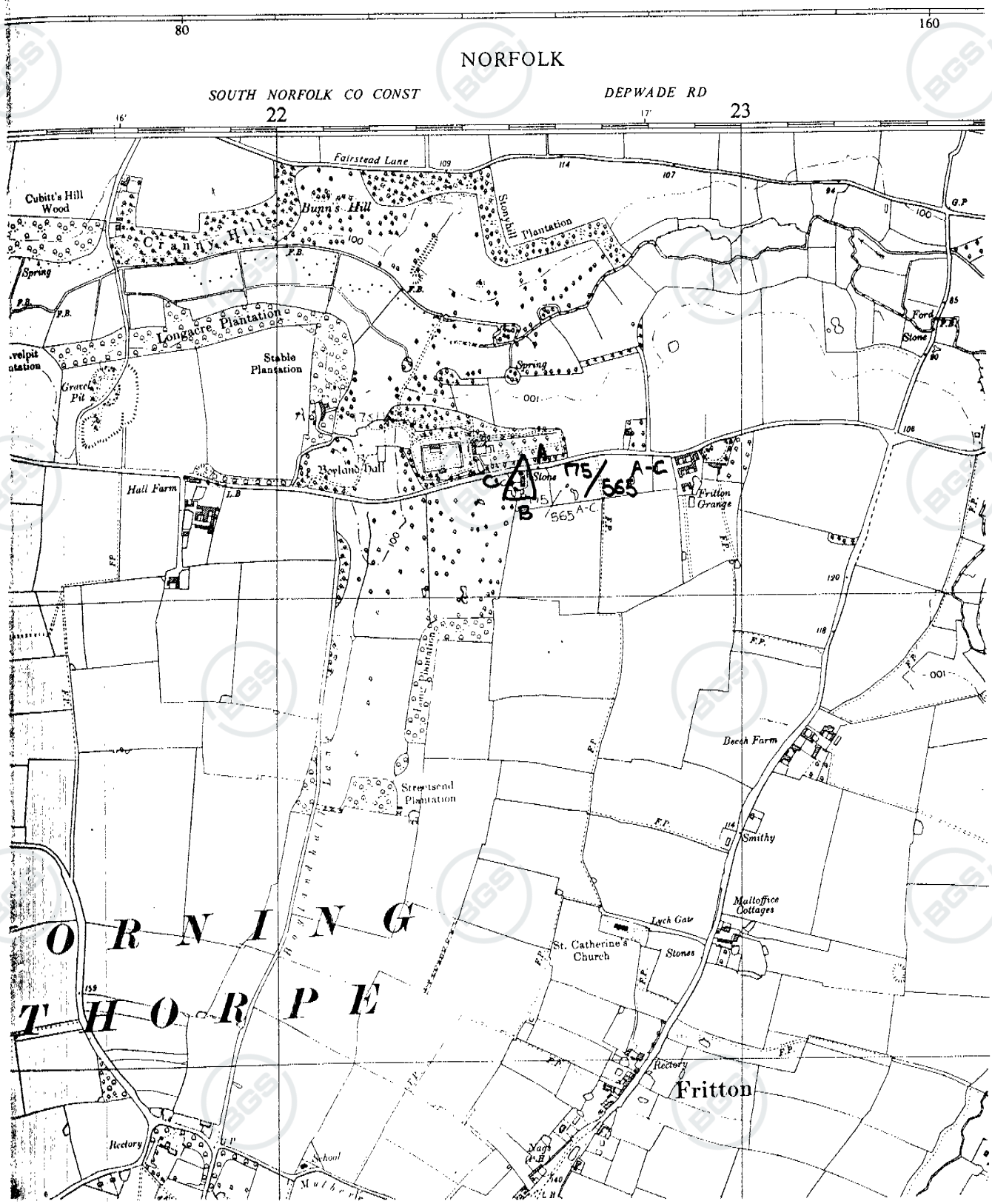
(For Institute use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far.	THICKNESS Feet	Inches	Metres	DEPTH Feet	Inches	Metre
Boulder Clay	Yellow clay			8			8
Age Uncertain	Gravel and sand with some clay			8			16
Chalk	Soft chalk and flints			34			50
CW 1982	Firm chalk with some flints						

BGS ID: 565634 : BGS Reference: TM29SW16/B
British National Grid (27700) : 622520,294240

TM 29 SW/16

ORDNANCE SURVEY

Scale 1:10,560 or 6 Inches to 1 Mile



Observation bore 1

RECORD OF WELL

For Institute use only Licence No.

TM29/72 NN

175/565 B

175/557(6) Site 13 Tas Valley Scheme

EXACT SITE OF WELL

At .....

.....

Town or Village Hempnall

County Norfolk

Six-inch County Sheet 87 SW/E

Six-inch National Grid sheet and reference TM 29 SW 2252 9424

For Anglian Water Authority (Norwich Division)

State whether owner, tenant, builder, contractor, consultant, etc.:— .....

Address (if different from above) .....

.....

Level of ground surface above sea level (O.D.) ..... ft (c. +38.10 m)

*DELETE AS NECESSARY

If well top is not at ground level, state how far above:* below: .....ft (.....m)

SHAFT.....ft (.....m); diameter.....ft (.....m);

HEADINGS (please attach details—dimensions and directions)

BORE.....ft (50 m); diameter: at top.....in (10 cm); at bottom.....in (.....cm)

Full details of permanent lining tubes (position, length, diameter, plain, slotted, etc.) .....

100 mm lining to 21 m (ie 5 m into the chalk)

.....

.....

.....

Water struck at depths of .....ft (.....m) below well top

TEST CONDITIONS during pumping from (a)

Rest level of water.....ft (9.11 m) ~~above*~~ below well top. Suction at.....ft (..... m)

Yield on..... hours'* days' test pumping at.....galls (.....m³) per..... with depression to.....ft (9.985 m) below well top. Recovery to ~~rest level~~ 9.18 m down in 22 ~~mins*~~ hours

Capacity of pump .....g.p.h. (.....m³/h)

Date of measurements 15–16 March 1976

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type..... Motive power.....

Capacity.....galls (.....m³) per hour. Suction at.....ft (..... m) below well top. Amount pumped.....galls (.....m³) per day. Estimated consumption.....galls (.....m³) per week

Well made by Henson of Shipdham Date of sinking 1976

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

Distance from (a) is 30m.

LOG OF STRATA OVERLEAF

Received from AWA (via Mr Parney of Imperial College)

Date 23.4.76

Observation well ✓

Recorder.....

E.R. log .....

Site marked on

1″ map .....

6″ map .....

(use symbol)

Copy to .....

.....

Date .....

INSTITUTE OF GEOLOGICAL SCIENCES,
WATER DEPARTMENT,
SOUTH KENSINGTON,
LONDON, S.W.7.

175/56SE

(For Institute use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA (If measurements start below ground surface, state how far.)	THICKNESS Feet	Inches	Metres	DEPTH Feet	Inches	Metre
BOULDER CLAY	Yellow clay			8			8
GLACIAL SAND & GRAVEL	Gravel and sand with some clay			8			16
UPPER CHALK	Soft chalk and flints			34			50
	Firm chalk with some flints						

P.P.
R.J.WYATT
29.3.82

RECORD OF WELL

For Institute use only Licence No.

TM29/72 B N .....

175/565 B

At Site 13

Observation borehole No. 1

Town or Village Hempnall

County .....

EXACT SITE OF WELL

Six-inch National Grid sheet and reference TM 2252 9424

For .....

State whether owner, tenant, builder, contractor, consultant, etc.: .....

Address (if different from above) .....

.....

Level of ground surface above sea level (O.D.) ..... ft (..... m)

*DELETE AS NECESSARY

If well top is not at ground level state how far ~~above~~:* below: ..... ft (..... m)

SHAFT ..... ft (..... m); diameter ..... ft (..... m);

HEADINGS (please attach details—dimensions and directions)

BORE ..... ft (51 m); diameter: at top ..... in (n/k mm);

at bottom ..... in (..... mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

22 m from surface

.....

.....

.....

Water struck at depths of ..... ft (..... m) below well top

TEST CONDITIONS

Rest level of water ..... ft (c. 10 m) ~~above~~* below well top. Suction at ..... ft (..... m)

Yield on ..... hours'* days' test pumping at ..... galls per ..... (..... l/s) with

depression to ..... ft (c. 11 m) below well top. Recovery to rest level in ..... mins* hours

Capacity of pump ..... g.p.h. (..... l/s)

Date of measurements .....

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type ..... Motive power .....

Capacity ..... galls (..... m^3) per hour. Suction at ..... ft (..... m)

below well top. Amount pumped ..... galls (..... m^3) per day. Estimated

consumption ..... galls (..... m^3) per week

Well made by ..... Date of sinking .....

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

Data from Norwich ~~Rivers~~ Water Division, 13.8.81

LOG OF STRATA OVERLEAF

Received from .....

.....

.....

Date .....

Observation well .....

Recorder .....

ER log .....

Site marked on

1" map .....

6" map—Grid Sheet .....

(use symbol)

Copy to .....

.....

Date .....

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2491 10 000 7/79

For Institute use only

Geological Classification	NATURE OF STRATA *If measurements start below ground surface, state how far.*	Thickness			Depth		
		Feet	Inches	Metres	Feet	Inches	Metres
	Drift			9			9
	? Crag			9			18
	Chalk			33			51

Observation bore 2

RECORD OF WELL

For Institute use only Licence No.
TM 29 SW/16C
NN.....
175/565 C

At .....

.....

Town or Village Hempnall

County Norfolk

Six-inch County Sheet 87 SW/E

175/557(c) Site 13 Tas Valley Scheme

Six-inch National Grid sheet and reference TM 29 SW 2251 9425

For Anglian Water Authority (Norwich Division)

State whether owner, tenant, builder, contractor, consultant, etc.:— .....

Address (if different from above) .....

.....

Level of ground surface above sea level (O.D.) ..... ft (+c. 38.10 m)

If well top is not at ground level, state how far above:* below: .....ft (.....m)

SHAFT.....ft (.....m); diameter.....ft (.....m);

HEADINGS (please attach details—dimensions and directions)

BORE.....ft (76 m); diameter: at top.....in (10 cm); at bottom.....in (.....cm)

Full details of permanent lining tubes (position, length, diameter, plain, slotted, etc.) .....

100 mm lining to 50 m

(ie 34 m into the chalk — as in (a))

.....

.....

Water struck at depths of .....ft (.....m) below well top

Rest level of water.....ft (9.06 m) ~~above*~~ below well top. Suction at.....ft (..... m)

Yield on..... hours'* days' test pumping at.....galls (.....m³) per..... with

depression to.....ft (10.32 m) below well top. Recovery to ~~rest level~~ 9.15 m below in 22 ~~mins*~~ hours

Capacity of pump .....g.p.h. (.....m³/h)

Date of measurements 15-16 March 1976

TEST CONDITIONS during pumping from (a)

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type..... Motive power.....

NORMAL CONDITIONS

Capacity.....galls (.....m³) per hour. Suction at.....ft (..... m)

below well top. Amount pumped.....galls (.....m³) per day. Estimated

consumption.....galls (.....m³) per week

Well made by Hewson of Shipdham Date of sinking 1976

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

Distance from (a) is 33 m.

LOG OF STRATA OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES,
WATER DEPARTMENT,
SOUTH KENSINGTON,
LONDON, S.W.7.

Received from A.W.A. (c/o M.R. Pavey of Imperial College)
Date 23.4.76
Observation well ✓
Recorder.....
E.R. log .....
Site marked on
1" map .....
6" map .....
(use symbol)
Copy to .....
.....
Date .....

BGS ID: 565635 : BGS Reference: TM29SW16/C
British National Grid (27700) : 622510,294250

TM 29 SW/16

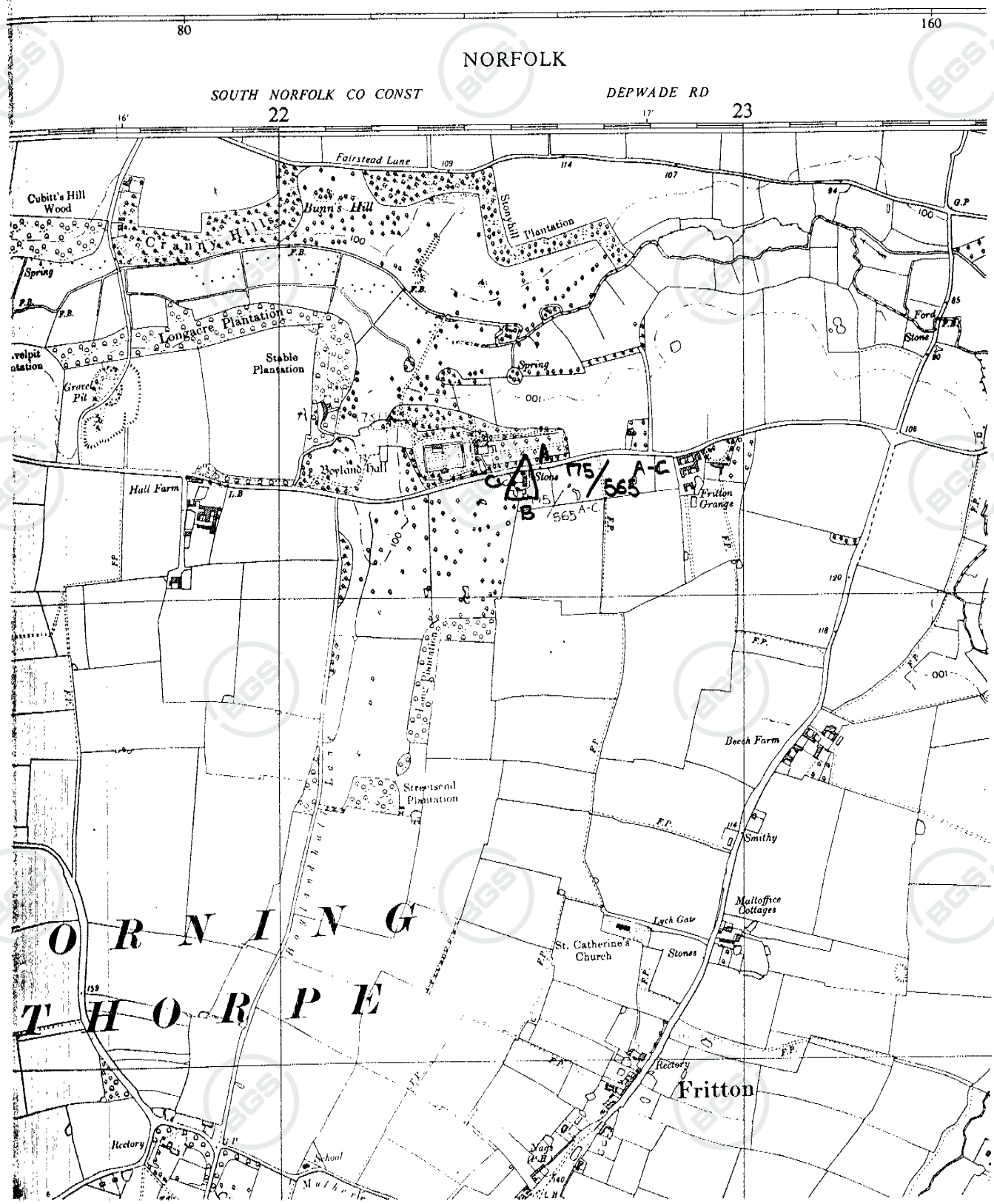
(For Institute use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far.	THICKNESS Feet	Inches	Metres	DEPTH Feet	Inches	Metre
Boulder Clay	Yellow clay			8			8
Age Uncertain	Gravel and Sand with some clay			8			16
Chalk	Soft chalk and flints						
CW 1982	Firm chalk with some flints			60			76

BGS ID: 565635 : BGS Reference: TM29SW16/C
British National Grid (27700) : 622510,294250

TM 29 SW/16

ORDNANCE SURVEY

Scale 1:10,560 or 6 Inches to 1 Mile



Observation bore 2

TM29/172

For Institute use only Licence No.

NN

175/565 C

RECORD OF WELL

175/557(c) Site 13 Tas Valley Scheme

At .....

.....

Town or Village Hempnall

County Norfolk

EXACT SITE OF WELL

Six-inch County Sheet 87 SW/E

Six-inch National Grid sheet and reference TM 29 SW 2251 9425

For Anglian Water Authority (Norwich Division)

State whether owner, tenant, builder, contractor, consultant, etc.:— .....

Address (if different from above) .....

.....

Level of ground surface above sea level (O.D.) ..... ft (+c. 38.10 m)

*DELETE AS NECESSARY

If well top is not at ground level, state how far above:* below: .....ft (..... m)

SHAFT.....ft (.....m); diameter.....ft (.....m);

HEADINGS (please attach details—dimensions and directions)

BORE.....ft (76 m); diameter: at top.....in (10 cm); at bottom.....in (.....cm)

Full details of permanent lining tubes (position, length, diameter, plain, slotted, etc.) .....

100 mm lining to 50 m

(ie 34 m into the chalk — as in (a))

.....

.....

Water struck at depths of .....ft (.....m) below well top

TEST CONDITIONS during pumping from (a)

Rest level of water.....ft (9.06 m) ~~above*~~ below well top. Suction at.....ft (..... m)

Yield on..... hours'* days' test pumping at.....galls (.....m³) per..... with depression to.....ft (10.32 m) below well top. Recovery to ~~rest level~~ 9.15 m bor in 22 ~~mins*~~ hours

Capacity of pump .....g.p.h. (.....m³/h)

Date of measurements 15-16 March 1976

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type..... Motive power.....

Capacity.....galls (.....m³) per hour. Suction at.....ft (..... m) below well top. Amount pumped.....galls (.....m³) per day. Estimated consumption.....galls (.....m³) per week

Well made by Hewson of Shipdham Date of sinking 1976

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

Distance from (a) is 33 m.

LOG OF STRATA OVERLEAF

Received from A.W.A. (via M.R. Perez of Imperial College)

Date 23.4.76

Observation well ✓

Recorder.....

E.R. log .....

Site marked on

1" map .....

6" map .....

(use symbol)

Copy to .....

.....

Date .....

INSTITUTE OF GEOLOGICAL SCIENCES,
WATER DEPARTMENT,
SOUTH KENSINGTON,
LONDON, S.W.7.

175/56 ?c.

35

(For Institute use only) Geological Classification	Nature of Strata. If measurements start below ground surface, state how far.	Thickness Feet	Thickness Inches	Thickness Metres	Depth Feet	Depth Inches	Depth Metres
BOULDER CLAY	Yellow clay			8			8
GLACIAL SAND & GRAVEL	Gravel and sand with some clay			8			16
UPPER CHALK	Soft chalk and flints						
	Firm chalk with some flints			60			76

P.P.
R.J. WYATT
29.3.82

RECORD OF WELL

For Institute use only Licence No.

N .....

TM 29/72 C

175/585 C

At Site 13

Observation borehole No. 2

Town or Village Hempnall

County .....

EXACT SITE OF WELL

Six-inch National Grid sheet and reference TM 2251 9425

For .....

State whether owner, tenant, builder, contractor, consultant, etc.: .....

Address (if different from above) .....

.....

Level of ground surface above sea level (O.D.) ..... ft (..... m)

*DELETE AS NECESSARY

If well top is not at ground level state how far above:* / below: ..... ft (..... m)

SHAFT ..... ft (..... m); diameter ..... ft (..... m);

HEADINGS (please attach details—dimensions and directions)

BORE ..... ft (77 m); diameter: at top ..... in (n/k mm);

at bottom ..... in (..... mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

51 m from surface

.....

.....

.....

Water struck at depths of ..... ft (..... m) below well top

TEST CONDITIONS

Rest level of water ..... ft (6.10 m) ~~above~~* / below well top. Suction at ..... ft (..... m)

Yield on ..... hours'* / days' test pumping at ..... galls per ..... (..... l/s) with depression to ..... ft (5.12 m) below well top. Recovery to rest level in ..... mins* / hours

Capacity of pump ..... g.p.h. (..... l/s)

Date of measurements .....

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type ..... Motive power .....

Capacity ..... galls (..... m^3) per hour. Suction at ..... ft (..... m) below well top. Amount pumped ..... galls (..... m^3) per day. Estimated consumption ..... galls (..... m^3) per week

Well made by ..... Date of sinking .....

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

Data from Norwich Water Division, 13.8.81

LOG OF STRATA OVERLEAF

Received from .....

.....

.....

Date .....

Observation well .....

Recorder .....

ER log .....

Site marked on

1" map .....

6" map—Grid Sheet .....

(use symbol)

Copy to .....

.....

Date .....

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2494 10 000 7/79

BGS ID: 565635 : BGS Reference: TM29SW16/C
British National Grid (27700) : 622510,294250

For Institute use only

Geological Classification	NATURE OF STRATA *If measurements start below ground surface, state how far.*	Thickness			Depth		
		Feet	Inches	Metres	Feet	Inches	Metres
	Drift			9			9
	? Crag			9			18
	Chalk			59			77

EASTERN ENGLAND L.S
ANGLIAN E.A.

RECORD OF WELL

For Institute use only Licence No. NN 970072

At BOYLANDS HOUSE
HORNINGTHORPE
Town or Village HEMPNALL
County NORFOLK

TM29 180 161 TM29 SW21

EXACT SITE OF WELL

Six-inch National Grid sheet and reference TM 2234 9480
For MR R H ASH-LAMBER
State whether owner, tenant, builder, contractor, consultant, etc. OWNER
Address (if different from above) AS ABOVE

Level of ground surface above sea level (O.D.) 108 ft (32.9 m)

*DELETE AS NECESSARY

If well top is not at ground level state how far above* below* ..... ft (..... m)
SHAFT ..... ft (..... m); diameter ..... ft (..... m);
HEADINGS (please attach details—dimensions and directions)
BORE 140 ft (42.67 m); diameter at top 6" in (152.4 mm);
at bottom 6" in (152.4 mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):
W/GUARD STEEL TUBE 92 Pc 28.04 m
PLAIN BORED 48 Pc 14.63 m

Water struck at depths of ..... ft (..... m) below well top
Rest level of water 86 ft (7.92 m) above* below* well top. Suction at ..... ft (..... m)

TEST CONDITIONS

Yield on 4 hours* days* test pumping at 1000 galls per HOUR (1.26 l/s) with
depression to 98 ft (6.53 m) below well top. Recovery to rest level in ..... mins* hours*
Capacity of pump ..... g.p.fl. (..... l/s)
Date of measurements 9.8.97

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:
Make and/or type DAB SAISMR Motive power 240/3PH
Capacity 480 galls (..... m³) per hour. Suction at ..... ft (..... m)
below well top. Amount pumped ..... galls (..... m³) per day. Estimated
consumption ..... galls (..... m³) per week
Well made by PANKS ENGINEERS NORWICH. Date of sinking AUGUST 97

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF STRATA OVERLEAF

Received from PANKS ENGINEER
.....
Date 24.10.97
Observation well .....
Recorder .....
ER log .....
Site marked on
1" map .....
6" map—Grid Sheet .....
(use symbol)
Copy to .....
.....
Date .....

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2494 10 000 7/79

BGS ID: 565640 : BGS Reference: TM29SW21
British National Grid (27700) : 622340,294300

For institute use only

Geological Classification	Nature of Strata *If measurements start below ground surface, state how far.*	Thickness			Depth		
		Feet	Inches	Metres	Feet	Inches	Metres
	TOP SOIL	2	00		2	00	
	CLAY	8	00		10	00	
	SAND & SHINGLE	37	00		47	00	
	CLAY	5	00		52	00	
	CHALK	88	00		140	00	
		T.D			42	67	m

EASTERN ENGLAND L.S
ANGLIAN E.A.

RECORD OF WELL

For Institute use only Licence No. NN 970072

At BOYLANDS HOUSE
HORNINGTHORPE
Town or Village HEMPNALL
County NORFOLK

TM29 180 161 TM29 SW

EXACT SITE OF WELL

Six-inch National Grid sheet and reference TM 2234 9430

For MR R H ASH-LAMBER

State whether owner, tenant, builder, contractor, consultant, etc: OWNER

Address (if different from above) AS ABOVE

Level of ground surface above sea level (O.D.) 108 ft (32.9 m)

*DELETE AS NECESSARY

If well top is not at ground level state how far above* below: ..... ft (..... m)

SHAFT..... ft (..... m); diameter..... ft (..... m);

HEADINGS (please attach details—dimensions and directions)

BORE 140 ft (42.67 m); diameter: at top 6" in (152.4 mm);
at bottom 6" in (152.4 mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

W/GLVD STEEL TUBE 92 Ft 28.04 m
PLAIN BORED. 48 Ft 14.63 m

Water struck at depths of ..... ft (..... m) below well top

*TEST CONDITIONS

Rest level of water 26 ft (7.92 m) above* below well top. Suction at..... ft (..... m)

Yield on 4 hours* test pumping at 1500 galls per HOUR (1.26 l/s) with depression to 28 ft (6.53 m) below well top. Recovery to rest level in ..... mins* hours

Capacity of pump..... g.p.fl. (..... l/s)

Date of measurements 9:8:97

*NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type DAB SAISMB Motive power 240 VOLTS

Capacity 480 galls (..... m³) per hour. Suction at ..... ft (..... m)

below well top. Amount pumped..... galls (..... m³) per day. Estimated consumption ..... galls (..... m³) per week

Well made by PANKS ENGINEERS Date of sinking August 97

ADDITIONAL NOTES ANALYSIS (please attach copy if available) NORWICH.

LOG OF STRATA OVERLEAF

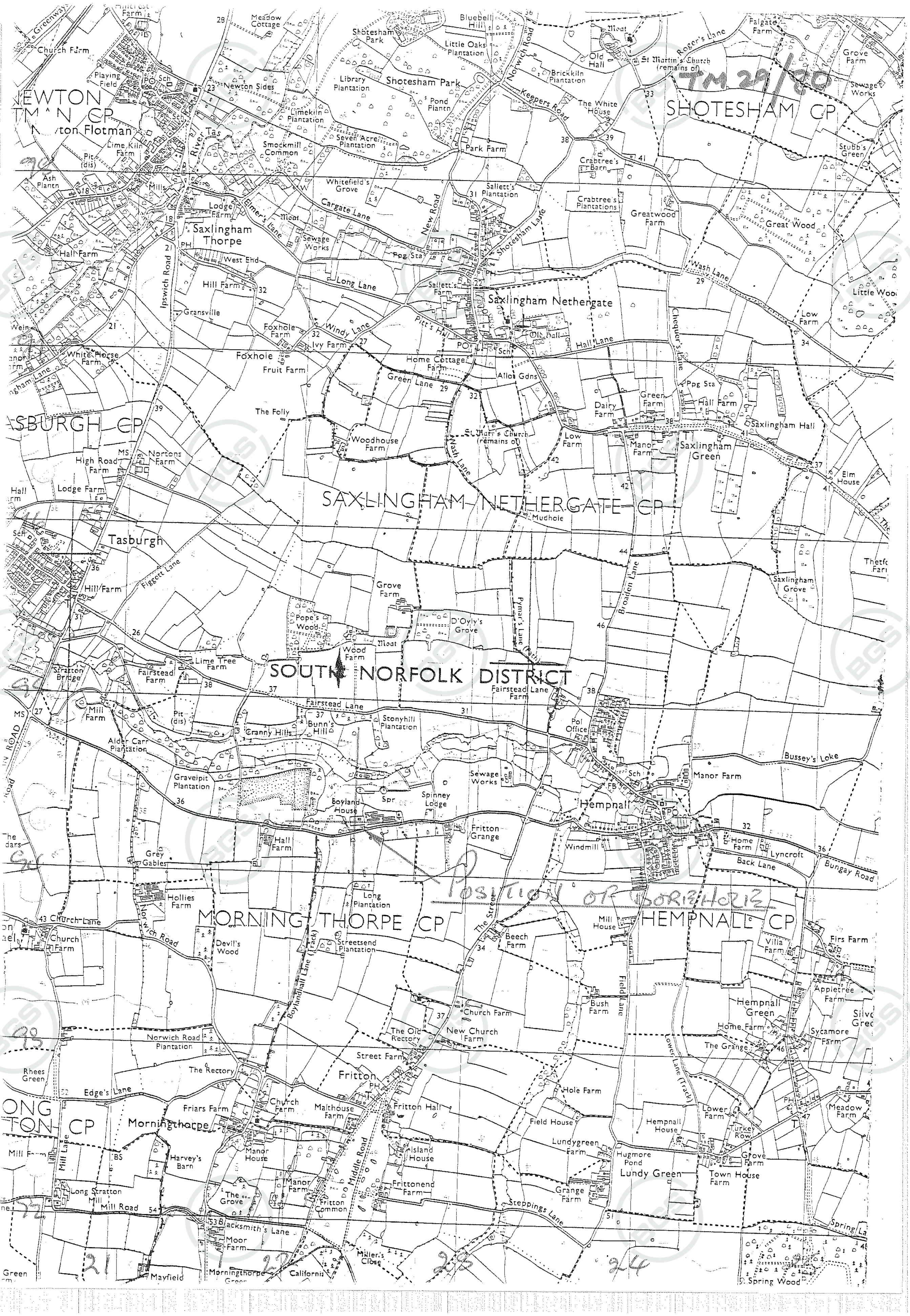
Received from PANKS ENGINEER
Date 24-10-97
Observation well.....
Recorder.....
ER log.....
Site marked on
1" map.....
6" map—Grid Sheet.....
(use symbol)
Copy to.....
Date.....

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 1494 10 000 7/79

For Institute use only

Geological Classification	Nature of Strata *If measurements start below ground surface, state how far.*	Thickness Feet	Thickness Inches	Thickness Metres	Depth Feet	Depth Inches	Depth Metres
	Top Soil	2	00		2	00	
	Clay	8	00		10	00	
	Sand & Shingle	37	00		47	00	
	Clay	5	00		52	00	
	Chalk	88	00		140	00	
		T.D			42	67	m


TM 29/80
SHOTESHAM CP
Shotesham Park
Newton Flotman
Saxlingham Thorpe
Saxlingham Nethergate
SAXLINGHAM NETHERGATE CP
Saxlingham Green
Saxlingham Hall
Tasburgh
SOUTH NORFOLK DISTRICT
Hempnall
HEMPNALL CP
MORNING THORPE CP
Morningthorpe
Fritton
Hempnall Green
Lundy Green
POSITION OF BOREHOLE
Ipswich Road
Norwich Road
Broaden Lane
Bungay Road
Wash Lane
Long Lane
Windy Lane
Fairstead Lane
Back Lane
Steppings Lane
Middle Road
Field Lane
Bussey's Loke
Greatwood Farm
Great Wood
Little Wood
Grove Farm
Manor Farm
Mill House
Church Farm
Hollies Farm
Fritton Hall
Hole Farm
Street Farm
The Rectory
Spring Wood

NORFOLK COUNTY COUNCIL

HIGHWAYS DEPARTMENT LABORATORY

BOREHOLE LOG

TM 29 SW 27
2200 9431

Log No 6 Scheme Morningthorpe Pit. Job No 6074

Started 20.1.81. Finished 20.2.81. Carried out for Waste Disposal Section.

A.O.D. 33.92m (Top of casing) O.S.No. TM 29SW Map Reference ~~2202 9405~~

Highest water level 7m Lowest water level

Depth metres	Description	Smpl	Key	MC %	SPT 'n'	Vane kNm	Laboratory Tests
	Dark brown, silty TOPSOIL with roots and occasional stones (20mm max)			28.0			
				17.0			
	Yellow brown SILT with stones (37.5mm max)			17.0			
2	Yellow brown fine SANDand SILT with some soft to firm silty clay layering.						
	Sandy, fine, medium, and coarse GRAVEL with some chalk nodules.			9.8			P.S.D.(p17)
3							
4							
6							
	Slighty sandy, fine, med. and coarse GRAVEL with some chalk and occasional flint cobble.			6.7			P.S.D.(p17)
7							
8	Slightly sandy fine to medium GRAVEL with some chalk nodules.			9.1			P.S.D.(p17)
9							

Borehole B6

BOREHOLE LOG (Continuation)

TM29SW 27

Log No 6 Scheme Morningthorpe Pit. Job No 6074

Depth metres	Description	Smpl	Key	MC %	SPT 'n'	Vane kNm	Laboratory Tests
11	SHELL DEBRIS in a matrix of fine sand and silt.	●		24.7			
12							
	Hard, pale grey CHALK with occasional flints.	●					
14							A permanent plastic casing was left in the bore extending just into the chalk. The bottom 3m of casing was perforated and covered with close weave fibre-glass.

Borehole B6

161/62 Uppergate Green Farm, Shotesham (formerly Upgates Farm) 2599.

W.S. Nk. p. 118. Surface +144. Shaft 70; rest bore. Fake, 1906.

43·89

Yield c. 280 g.p.h. Sept. 1947. R.W.L. +84. I/c engine. Aug. 1960.

Pleist. Drift	...	...	81½	81½
? Crag	...	...	30½	112
UCk	...	...	84	196

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS	DEPTH
	WELL [OLD?]		70
GLACIAL DRIFT	LOAM + SAND	3½	73½
	YELLOW SAND, FINE	8	81½
	ROUGH RED SAND	6	87½
? CRAG	SLATE-COLOURED SAND + STONES (SMELLS BAD	10	97½
	BLUE SAND	13½	111
	STONES	1	112
U CHALK	MARL	4	116
	CHALK	21	137
	SAND-GALL	4	141
	CHALK	55	196

59.74m

pp. F Cox
24.1.69.

6" quarter Sheet
87 NE/E

Page 118

161/62 Uppergate Green Farm, Shotesham (formerly Upgates Farm)

W.S. Nk. p. 118. Surface +144. Shaft 70; rest bore. ~~Fake~~, Fake, 1906.

TM29/37

Yield c. 280 g.p.h. Sept. 1947. R.W.L. +84. I/c engine. Aug. 1960.

Pleist. Drift	...	...	81½	81½
? Crag	...	...	30½	112
UCk	...	...	84	196

GEOLOGICAL CLASSIFICATION	NATURE OF STRATA	THICKNESS	DEPTH
WELL [OLD?]			70
GLACIAL DRIFT	LOAM + SAND	3½	73½
	YELLOW SAND, FINE	8	81½
	ROUGH RED SAND	6	87½
? CRAG	SLATE-COLOURED SAND + STONES (SMELLS BAD	10	97½
	BLUE SAND	13½	111
	STONES	1	112
U CHALK	MARL	4	116
	CHALK	21	137
	SAND-GALL	4	141
	CHALK	55	196

PP. FCox
24.1.69.

1

161/62

TM29/37

Uppergate Green Farm.

Shotesham ~~All Saints~~.

Ordnance Map 161, new ser. (Norfolk 87, N.E.). Geologic Map 66.
Upgates Farm. 1906.
Made and communicated by Messrs. Fake, of Norwich.

		Thickness. Feet.	Depth. Feet.
Well [old?]		—	70
[Glacial Drift.]	Loam and sand	3½	—
	Yellow sand, fine	8	81½
	? Rough red sand	6	—
[? Crag.]	Slate-coloured sand and stones. Smells bad	10	—
	Blue sand...	13½	—
	Stones	112 +32	—
[Chalk.]	Marl	4	—
	Chalk	21	—
	Sand-gall....	4	—
	Chalk	55	196

agreed Mabery 24.1.69

Visited 4/9/47 DB.

Mrs. Harmer.

Use 200 g.p.w.

Takes 3/4 hr. to pump 200 gals. N/a pump surface, well top at 144.

Sited on Norfolk 87 NE/E.

Pump placed by Buckingham in 1922

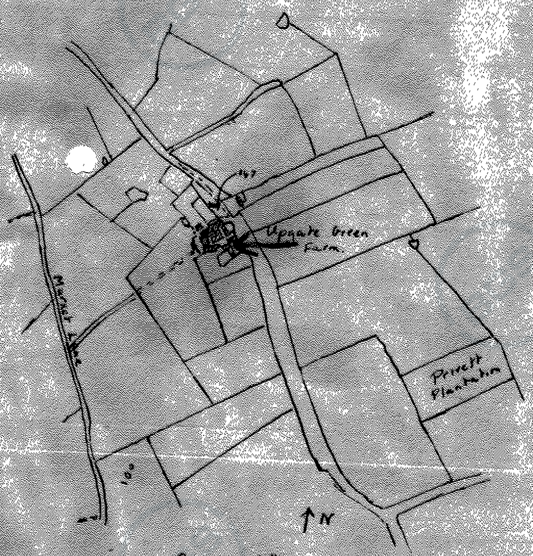
Visited. Known as Uppergate Green Farm.
House unoccupied at present
Supply for farm c. 200 g.p. week.
R.W.L. 60' b.w.t.
Petrol engine.

26/8/60 BH.

DATA Bank

Published in
'The Water Supply
of Norfolk,'
Page 118

2



Scale 6" = 1 mile

Shotesham All Saints

2661 9845 NE

(1)

RECORD OF WELL (SHAFT OR BORE)

For Survey use only
N. 13549
161 TM29/4
/679
Licence No.

EXACT SITE OF WELL

At HOWE HALL (Scott Pasture)

Town or Village HOWE

County NORFOLK. NOR 39W. Norfolk 87/NE/E Six-inch quarter sheet TM2661 . 9845

For M/S BURGESS BROS., State whether owner, tenant, builder, contractor, consultant, etc.:— OWNERS

Address (if different from above)

Level of ground surface above sea-level (O.D.) +c 130 ft. If well-top is not at ground level, state how far { above: below; ft.

SHAFT 65 ft.; diameter ft.; Full details of headings (dimensions and directions)

BORE to 160 (48.76 m) ft.; diameter of bore: at top 4 (101.6 mm) ins.; at bottom 4 (101.6 mm) ins.

Full details of permanent lining tubes (position, length, diameter, plain, slotted etc.)
(101.6 mm) 4" H/W. S. & S. TUBE TO 135FT. (41.14 m) DEPTH.
PLAIN BORED (UNLINED) FOR 25FT (7.62 m) "

Water struck at depths of 65 FT. (19.81 m) ft. below well-top.

TEST CONDITIONS

Rest level of water 64 (19.50 m) ft. ~~above~~ below well-top. Suction at 117 (35.66 m) ft. Yield on 8 hours' ~~days~~ test pumping at 270 (0.341 l/s) galls. per HOUR with depression to - ft. below well-top.

Recovery to rest-level in - mins. hours Capacity of pump - g.p.h. Date of measurements 20.11.72.

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type GODWIN K1. Motive power ENGINE DRIVEN

Capacity 270 (0.341 l/s) gallons per hour. Suction at 117 (35.66 m) ft.

Amount pumped - galls. per day. Estimated consumption - galls. per week.

Well made by PANKS (CASTLE HILL) LTD., NORWICH. Date of well 20.11.72.

Information from " " "

ADDITIONAL NOTES

ANALYSIS (please attach copy if available)

LOG OF STRATA OVERLEAF.

Geological Survey and Museum, South Kensington, London, S.W.7.	Copy to: DG. EA & SE.	Section 6.	Date Received	1" O.S. Map No.	Site marked on 1" Map	(use symbol) on 6" Map
			28/12/72		o	o

(1527) Dd574/Wt37583 12,000 8/54 JC&S Gp669

(2)

(For Survey use only) Geological Classification	Nature of Strata. If measurements start below ground surface, state how far ..	Metres T	Metres D	Thickness Feet	Thickness Inches	Depth Feet	Depth Inches
Pleist. Drift →	EXISTING DUG WELL	19·81	19·81	65	-		
Boulder Clay	BLUE CLAY	2·13	21·95	7	-	72	-
? Norwich Crag.	SAND & SHINGLE	5·48	27·43	18	-	90	-
	RUNNING SAND.	6·70	34·13	22	-	112	-
Upper Chalk	CHALK.	14·63	48·76	48	-	160	-

P.P.
B. Young.
16·1·73

Date Bank

TM29NE/4
255 6.9685

161/508 Lathgreen Farm, Shotesham

Surface +135. Shaft 52; rest bore. Lining tubes: 82 x 4 in. Ck +46.
R.W.L. +76. I/c engine. Hardness: total 574. Ferruginous. Anal. Page, July 1949.

Yield 700 - 800 g.p.d. Aug. 1960.

Boulder Clay)	...	...	c.52	c.52
Sand and Gravel)	...	...	c.37	89
Crag	...	...	72	161
Ick	...	...		

Chalky Boulder Clay
Sand + Gravel c52'

Norwich Crag
c. 37'

Upper Chalk
72

Well	52	52
Sand + Shingle	21	73
Grey sand	16	89
Chalk	72	161

(49.07)

pp. Flox
23.170.

6" quarter sheet
87 SE/E

BGS ID: 565604 : BGS Reference: TM29NE4
British National Grid (27700) : 625560,296850

TM29NE/4
255 6.9685

161/508 Lathgreen Farm, Shotesham

41.15

Surface +135. Shaft 52; rest bore. Lining tubes: 82 x 4 in. Ck +46.

R.W.L. +76. I/c engine. Hardness: total 574. Ferruginous. Anal. Page, July 1949.

Yield 700 - 800 g.p.d. Aug. 1960.

Boulder Clay)	...	...	c.52	c.52
Sand and Gravel)	...	...	c.37	89
Crag	...	...	72	161
Ck	...	...		

Chalky Boulder Clay
sand + Gravel c52'

Norwich Crag
c. 37'

Upper Chalk
72

pp. Flox
23.1.70.

6" quarter sheet
87 SE/E

Well
Sand + Shingle
Grey sand
Chalk

	52	52	15.85
+25.30			
	21	73	22.25
		11.28	
	16	89	27.13
+14.02			
	72	161	
		(49.07)	

161/508 Lathgreen Farm, Shotesham TM29/38

Surface +135. Shaft 52; rest bore. Lining tubes: 82 x 4 in. Ck +46. R.W.L. +76. I/c engine. Hardness: total 574. Ferruginous. Anal. Page, July 1949.

Yield 700 - 800 g.p.d. Aug. 1960.

Boulder Clay) Sand and Gravel)	...	...	c.52	c.52
Crag	...	...	c.37	89
Uck	...	...	72	161

Chalky Boulder Clay sand + gravel c52'

Norwich Crag c.37'

Upper Chalk 72

pp. Flox 23.170.

6" quarter Sheet 87 SE/E

Well	52	52
Sand + Shingle	21	73
Grey sand	16	89
Chalk	72	161

TM29/38

RECORD OF WELL (SHAFT OR BORE)

For Survey use only N. 6739

161/508

Licence No.....

EXACT SITE OF WELL

At LATHGREEN FARM

Town or Village SHOTESHAM

County Norfolk. Six-inch quarter sheet 87 SE/E

For Lt. Col. F.R. Leitch. State whether owner, tenant, builder, contractor, consultant, etc.:— owner

Address (if different from above).....

Level of ground surface above sea-level (O.D.) +c. 135 ft. If well-top is not at ground level, state how far { above: / below; ..... ft.

SHAFT 52 ft.; diameter..... ft.; Full details of headings (dimensions and directions)

.....

.....

BORE 109 ft.; diameter of bore: at top 4 ins.; at bottom 4 ins.

Full details of permanent lining tubes (position, length, diameter, plain, slotted etc.).....

lined 81' 11" x 4"

.....

Water struck at depths of..... ft. below well-top.

TEST CONDITIONS

Rest level of water 59 ft. ~~above~~ below well-top. Suction at..... ft. Yield on..... hours' / days' test pumping at..... galls. per..... with depression to..... ft. below well-top.

Recovery to rest-level in..... mins. / hours Capacity of pump..... g.p.h. Date of measurements.....

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type Climax 24R Motive power Petter Petrol engine

Capacity..... gallons per hour. Suction at..... ft.

Amount pumped..... galls. per day. Estimated consumption..... galls. per week.

Well made by T.W. Page, Sprowston Rd. Norwich Date of well 4th July 1949

Information from Norfolk AEC. file WS 880/161. 8.12.54. Rok - REA.

ADDITIONAL NOTES

ANALYSIS (please attach copy if available)

Sited by ⊙ on 6" map Norfolk 87 SE/E.

Visited.
OD+c. 135.
Consumption 700 - 800 g.p.d.
Petrol engine.
Water very hard & ferruginous. Softened for domestic use.
26/8/60 BN.

LOG OF STRATA OVERLEAF.

Geological Survey and Museum, South Kensington, London, S.W.7.		Section 6.	Date Received	1" O.S. Map No.	Site marked on 1" Map	(use symbol) on 6" Map
			8.12.54		⊙	⊙

(1527) Dd574/W437583 12,000 8/54 JC&S Gp869

2

(For Survey use only) Geological Classification	NATURE OF STRATA If measurements start below ground surface, state how far ..	Thickness Feet ..	Thickness Inches ..	Depth Feet	Depth Inches
Chalky Boulder Clay } Sand and Gravel } 52	Well	52		52	
Nch Crag c.37	Sand & Shingle	21		73	
	Grey Sand	16		89	
uclk 72	Chalk	72		161	+46

Jf6 long
24.1.69
Confirmed
23/1/70.
J.6.69x

3.

AEC.

COPY

161 TM29/38

161/508

508

T. W. Page,
316 Sprowston Road,
Norwich.

Copy of Analysis of Water from W. Lincolne Sutton.

CERTIFICATE OF ANALYSIS OF WATER

Sample received from: **Lt. Col. Leitch, Lath Green Farm, Shotesham.**
Mark or Seal:
Appearance when received:

RESULTS OF CHEMICAL ANALYSIS	Grains per Gallon/[illegible]
Total Solids in Solution	
Free and Saline Ammonia	.0014
Albuminoid Ammonia	.0035
Chlorine in Chlorides	8.1
Nitrogen as Nitrates	nil
Nitrites	nil
Oxygen absorbed from Permanganate	
Hardness - Total	40.2
" - Permanent	

Bacteriological Results:-

Colonies per ml. on agar at 37° C. .. ..

Bacillus Coliform:-

Present in .. ..

Absent in .. ..

Physical Characters .. .. Rusty Sediment

REMARKS

This water is of good organic quality and free from any dangerous pollution, I am of the opinion that it is fit for drinking purposes when clear. It is, however distinctly ferruginous and hard, and thus inconvenient for domestic purposes unless clarified.

DATA Bank

TM 29 NE/5
2601·9625

161/509 Dawson's Farm, Shotesham

4·15

Surface +135. Lining tubes: 115 x 4 in from surface. Ck +43. R.W.L. +78. Page, Sept. 1950.

Yield c. 200 g.p.d. (summer); c. 100 g.p.d. (winter). I/c engine.

Aug. 1960.

Boulder Clay c.41	Loam	...	1	1
	Yellow clay	...	5	6
	Blue clay and chalk stone		25	31
	Yellow clay and stone		c.10	c.41
Sand and Gravel c.13	Sand and stone	...	c. 8	49
	Sand and shingle	...	5	54 (16·46)
+24·69				
Crag 38 (11·58)	Grey sand	...	34	88
	Grey sand and shell	...	3	91
	Stone	...	1	92 (28·04)
+13·11				
UCk 44	Chalk	...	44	136 (41·45)

pp. F. Cox. 24·1·69.

6" quarter sheet
87 SE/E

TM29/39

161/509 Dawson's Farm, Shotesham

Surface +135. Lining tubes: 115 x 4 in from surface. Ck +43. R.W.L. +78. Page, Sept. 1950.

Yield c. 200 g.p.d. (summer); c. 100 g.p.d. (winter). I/c engine.

Aug. 1960.

	Loam ...	1	1
Boulder Clay	Yellow clay ...	5	6
c.41	Blue clay and chalk stone	25	31
	Yellow clay and stone	c.10	c.41
Sand and Gravel	Sand and stone ...	c. 8	49
c.13	Sand and shingle ...	5	54
Crag	Grey sand ...	34	88
38	Grey sand and shell...	3	91
	Stone ...	1	92
UCk	Chalk ...	44	136
44			

pp. F.Cox. 24.1.69.

6" quarter sheet
87 SE/E

1.

RECORD OF WELL (SHAFT OR BORE)

TM29/39
For Survey use only
N. 6740
161/509
Licence No.

EXACT SITE OF WELL

At Dawson's Farm

Town or Village Shoresham

County Norfolk Six-inch quarter sheet 84 SE/E.

For P.W. Rounding State whether owner, tenant, builder, contractor, consultant, etc.:— owner

Address (if different from above)

Level of ground surface above sea-level (O.D.) +135 ft. If well-top is not at ground level, state how far .. {above: / below;} ..... ft.

SHAFT ..... ft.; diameter ..... ft.; Full details of headings (dimensions and directions)

BORE 136 ft.; diameter of bore: at top 4 ins.; at bottom 4 ins.

Full details of permanent lining tubes (position, length, diameter, plain, slotted etc.)

Lined 115 ft.

TEST CONDITIONS

Water struck at depths of ..... ft. below well-top.

Rest level of water 57 ft. ~~above~~ / below well-top. Suction at ..... ft. Yield on ..... hours' / days' test pumping at ..... galls. per ..... with depression to ..... ft. below well-top.

Recovery to rest-level in ..... mins. / hours Capacity of pump ..... g.p.h. Date of measurements .....

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type D.W. Pattern pump Motive power .....

Capacity ..... gallons per hour. Suction at ..... ft.

Amount pumped ..... galls. per day. Estimated consumption 450-500 galls. per ~~week~~ / day.

Well made by T.W. Page. Sprowston Rd. Norwich Date of well 12.9.50.

Information from Norfolk AEC. file WS 1358/136. 8.12.54. Pok + REA.

ADDITIONAL NOTES

ANALYSIS (please attach copy if available)

Sited by ⊙ on 6" map Norfolk 87 SE/E

Visited.
OD c.135.
Consumption c.200 g.p.d (Summer). 400 gall. tank.
c.100 g.p.d (Winter)
Petrol engine.
26/8/60 BH.

LOG OF STRATA OVERLEAF.

Geological Survey and Museum, South Kensington, London, S.W.7.		Section 6.	Date Received	1" O.S. Map No.	Site marked on 1" Map	(use symbol) on 6" Map
			8.12.54		⊙	⊙

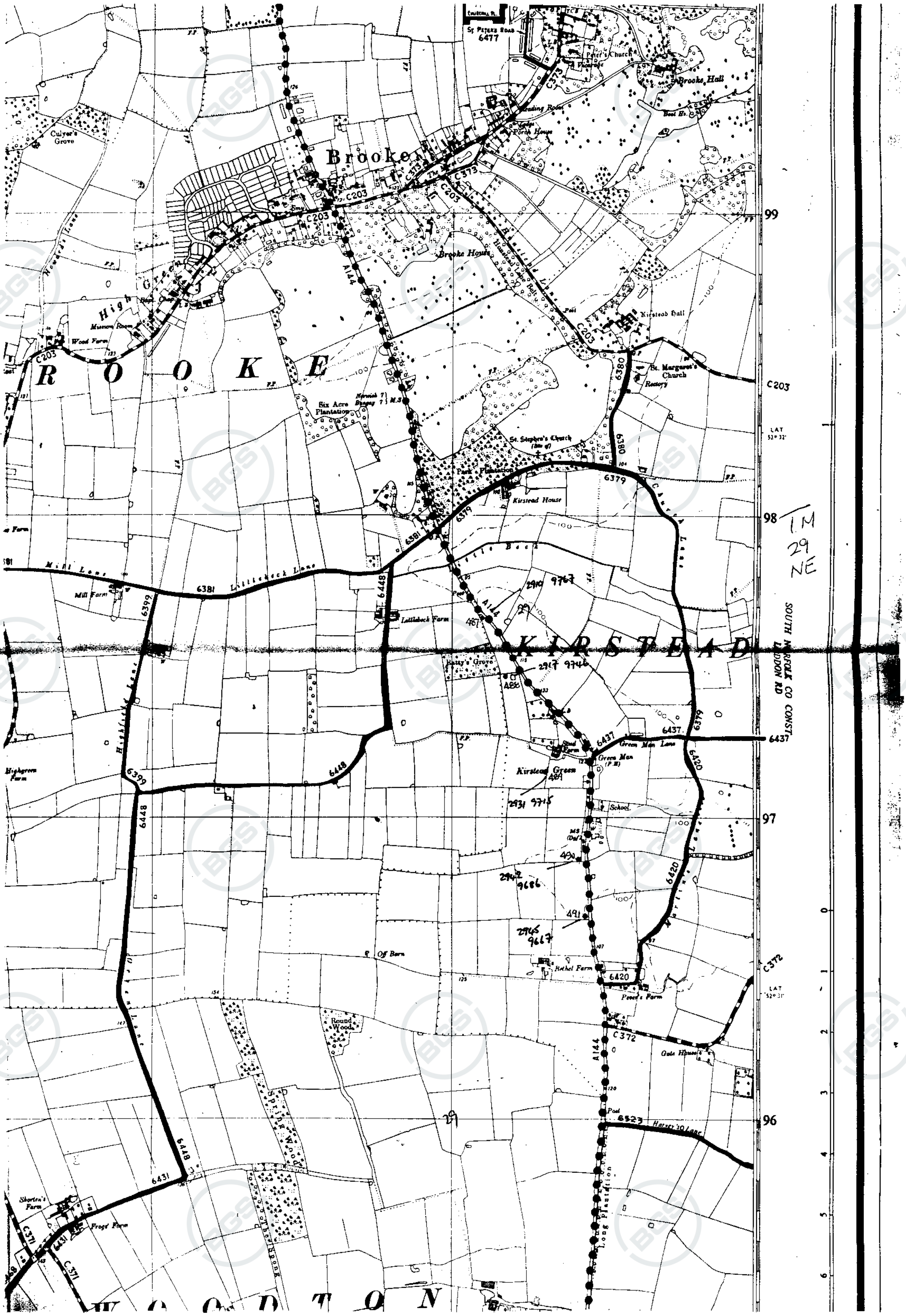
(1527) Dd574/Wt37583 12,000 8/54 JC&S Gp669

2

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far ..	THICKNESS Feet	THICKNESS Inches	DEPTH Feet	DEPTH Inches
Glacial Drift: Chalky Boulder clay	Loam	1			
	Yellow Clay	5		6	
	Blue Clay & Chalk Stone	25		31	
	Yellow " & Stone	10		41	
	Clay Sand & Stone	8		49	
glacial sand + gravel	Sand & Shingle	5		54	
Norwich crag	Grey Sand	34		88	
	" " & Shell	3		91	
	Stone	1		92	
Uch	Chalk	44		136	

[illegible]
24 . 1 . 69

DATA Bank


Brooke
Brooke Hall
Brooke House
St Peter's Church
Culyer's Grove
High Green
Mission Room
Wood Farm
C203
C373
A144
B R O O K E
Six Acre Plantation
Kirstead Hall
St. Margaret's Church
Rectory
St. Stephen's Church
Park Plantation
Kirstead House
6379
6380
6381
Mill Lane
Littlebeck Lane
Mill Farm
Littlebeck Farm
6399
6448
K I R S T E A D
Kirstead Green
Green Man Lane
6437
6420
School
Off Barn
Hethel Farm
Round Wood
C372
Gate House
Harvey's Lane
6323
Long Plantation
Shorten's Farm
Frogs' Farm
C371
6431
W O O D T O N
99
98
97
96
TM
29
NE
SOUTH NORFOLK CO CONST
LONDON RD

Eastern A.W.A.

NOTIFICATION No 890061

RECORD OF WELL

For Institute use only Licence No. N 890061

TM 29/75

TM29NE 13

At LEY FARM

Town or Village SHOTESHAM

County NORFOLK

EXACT SITE OF WELL

Six-inch National Grid sheet and reference TM 26549728

For MR CREY

State whether owner, tenant, builder, contractor, consultant, etc.: OWNER

Address (if different from above) ASHBY HALL

ASHBY ST MARY NORWICH

Level of ground surface above sea level (O.D.) ..... ft (37 APPROX m)

*DELETE AS NECESSARY

If well top is not at ground level state how far above* below: ..... ft (..... m)

SHAFT ..... ft (..... m); diameter ..... ft (..... m);

HEADINGS (please attach details—dimensions and directions)

BORE 180 ft (54.86 m); diameter: at top 4" in (101 mm);

at bottom 4" in (101 mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

WELDED STEEL TUBES 145'

PLAIN BORED 35'

Water struck at depths of ..... ft (..... m) below well top

TEST CONDITIONS

Rest level of water 36 ft (—— m) above* below well top. Suction at ..... ft (..... m)

Yield on 1 hours* days* test pumping at 450 galls per HOUR (..... l/s) with

depression to 100 ft (—— m) below well top. Recovery to rest level in —— mins* hours

Capacity of pump 450 g.p.h. (—— l/s)

Date of measurements 29.8.89

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type DAB BC24M. Motive power 240 VOLTS

Capacity ..... galls (..... m³) per hour. Suction at ..... ft (..... m)

below well top. Amount pumped ..... galls (..... m³) per day. Estimated

consumption ..... galls (..... m³) per week

Well made by PANKS ENGINEERS LTD NORWICH. Date of sinking AUGUST 89

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF STRATA OVERLEAF

Received from Panks Engineers Ltd

Date 22.9.89

Observation well .....

Recorder .....

ER log .....

Site marked on

1" map .....

6" map—Grid Sheet .....

(use symbol)

Copy to .....

Date .....

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2494 10 000 7/79

For Institute use only

Geological Classification	Nature of Strata *If measurements start below ground surface, state how far.*	Thickness			Depth		
		Feet	Inches	Metres	Feet	Inches	Metres
Boulder Clay	YELLOW CLAY	14	00		14	00	
	GREY CLAY	69	00		83	00	
? Crag	SAND & CLAY	18	00		101	00	
Upper Chalk	CHALK	79	00		180	00	

Eastern A.W.A.

NOTIFICATION No 890061

RECORD OF WELL

For Institute use only Licence No.

N 890061

TM 29/75

TM29NE

At LEY FARM

Town or Village SHOTESHAM

County NORFOLK

EXACT SITE OF WELL

Six-inch National Grid sheet and reference TM 26549728

For MR CREY

State whether owner, tenant, builder, contractor, consultant, etc.: OWNER

Address (if different from above) ASHBY HALL

ASHBY ST MARY NORWICH.

Level of ground surface above sea level (O.D.) ..... ft (37 APPROX m)

*DELETE AS NECESSARY

If well top is not at ground level state how far above* below*: ..... ft (..... m)

SHAFT ..... ft (..... m); diameter ..... ft (..... m);

HEADINGS (please attach details—dimensions and directions)

BORE 180 ft (54.86 m); diameter: at top 4" in (101 mm);

at bottom 4" in (10.1 mm)

Full details of permanent lining tubes (position, length, inner and outer diameters, plain slotted etc.):

WELDED STEEL TUBES 145'

PLAIN BORED 35'

Water struck at depths of ..... ft (..... m) below well top

TEST CONDITIONS

Rest level of water 36 ft (— m) above* below* well top. Suction at ..... ft (..... m)

Yield on 1 hours* days* test pumping at 480 galls per HOUR (..... l/s) with

depression to 100 ft (— m) below well top. Recovery to rest level in — mins* hours*

Capacity of pump 450 g.p.h. (— l/s)

Date of measurements 29.8.89

NORMAL CONDITIONS

DESCRIPTION OF PERMANENT PUMPING EQUIPMENT:

Make and/or type DAB BCZ4M. Motive power 240 VOLTS

Capacity ..... galls (..... m³) per hour. Suction at ..... ft (..... m)

below well top. Amount pumped ..... galls (..... m³) per day. Estimated

consumption ..... galls (..... m³) per week

Well made by PANKS ENGINEERS LTD NORWICH. Date of sinking AUGUST 89

ADDITIONAL NOTES ANALYSIS (please attach copy if available)

LOG OF STRATA OVERLEAF

INSTITUTE OF GEOLOGICAL SCIENCES
HYDROGEOLOGY UNIT
EXHIBITION ROAD
LONDON SW7 2DE

IGS 2494 10 000 7/79

Received from Panks Engineers Ltd

Date 27.9.89

Observation well .....

Recorder .....

ER log .....

Site marked on

1" map .....

6" map—Grid Sheet .....

(use symbol)

Copy to .....

Date .....

BGS ID: 565613 : BGS Reference: TM29NE13
British National Grid (27700) : 626540,297280

For Institute use only

Geological Classification	NATURE OF STRATA *If measurements start below ground surface, state how far.*	Thickness Feet	Thickness Inches	Thickness Metres	Depth Feet	Depth Inches	Depth Metres
	YELLOW CLAY.	14	00		14	00	
	GREY CLAY	69	00		83	00	
	SAND & CLAY.	18	00		101	00	
	CHALK	79	00		180	00	

Annex 4 Regulatory Consultation Responses – South Norfolk and Broadlands District Council

From: [redacted]
Sent: 01 April 2025 15:26
To: [redacted]
Subject: RE: Freedom of Information Request - East Pye Solar, Private Water Supplies
Attachments: East Pye PWS.xlsx

Good afternoon,

Please find the locations of the supplies within a 1km radius of your site boundaries. Hopefully all self-explanatory, for the PWSTYPE row BHW is borehole, MXW is mixed source, WEL is well and UNK is unknown. There may be other supplies that we have not been made aware of.

This information can be used to identify individual properties and is being supplied to you for the purpose of managing risk and protecting the drinking supplies in the area associated with the East Pye Solar scheme.

Kind regards
[redacted]

[redacted]
Environmental Quality Team Manager
[redacted]

Our Broadland and South Norfolk Councils offices are now based at Broadland Business Park in the Horizon Centre. Find out how you can access our services by visiting our website or by calling us on 01508 533633

From: [redacted]
Sent: 01 April 2025 12:00
To: [redacted]
Cc: [redacted]
Subject: RE: Freedom of Information Request - East Pye Solar, Private Water Supplies

Good Morning [redacted]

Following my emails on 11th and 18th of March, please could you confirm receipt of our query regarding private water supplies?

Kind regards,

[redacted]
MSci, RSoBRA, FGS
Principal Geoenvironmental Scientist

Address: Caversham Bridge House, Waterman Place, Reading, RG1 8DN
[redacted]

Proud to Support Pride@Stantec

Stantec

From: [redacted]
Sent: 18 March 2025 09:42
To: [redacted]
Cc: [redacted]
Subject: RE: Freedom of Information Request - East Pye Solar, Private Water Supplies

Good Morning [redacted]

Just following up on my email below, please could you confirm receipt?

Kind regards,

[redacted]
MSci, RSoBRA, FGS
Principal Geoenvironmental Scientist

Address: Caversham Bridge House, Waterman Place, Reading, RG1 8DN
[redacted]

Proud to Support Pride@Stantec

Stantec

From [redacted]
Sent: 11 March 2025 09:22
To [redacted]
Cc: [redacted]
Subject: RE: Freedom of Information Request - East Pye Solar, Private Water Supplies

Good Morning [redacted]

We have recently received the Scoping Opinion on this scheme and ground conditions will be forming part of the Preliminary Environmental Information Report (PEIR) and Environmental Statement (ES).

In their scoping response, the Environment Agency (EA) stated the following:

"***Issue***: *The report shows 35 No. private water supplies within 250m of the Site, for which accurate location data and abstraction stratum information was unavailable. Approximate locations of the abstractions are shown as Annex 4 of the Phase 1 GCA report. Assuming a worst-case scenario that all private abstractions are for potable use, they would each require default 50m Source Protection Zone 1 buffers. Without accurate locations it is difficult to ascertain what parts of the site overlie these designated buffers.*

Impact: *Unknown risk to private water supplies.*

Recommendation: *Determine the locations (and where possible abstracted strata) of, and assess potential impacts to, private water abstractions and their applicable SPZ1 buffers, within potential influencing distance of the site. In the absence of further information assume a reasonable worst case in terms of spatial influence*".

And

*"**Issue**: The stated 250m search buffer is insufficient for the proposed Substation in Site 5.*

Impact: *Until design parameters are determined there remains the risk that HDD and/ or foundation construction could impact the bedrock aquifer / Secondary A aquifers. Should be 1km to be consistent with BESS & other substations*

Recommendation: *Increase the search buffer for identification of groundwater abstractions and source protection zones to 1km around all substations and BESS*".

In order to comply with the EA's requests we will require further information from the Council relating to private water supplies.

Please could you provide the locations of all private water supplies within 1.0 km of the scheme boundary as shown on the attached. Where it is known, please could you also provide information relating to the nature of the water supply, e.g., whether it is a borehole, or a shallow well, or another form of supply, and which stratum water is abstracted from. A .kmz file of the red line boundary is attached for your convenience.

I recognise that the locations of the private water supplies were purposefully anonymised in your earlier response (see attached). If, following the EA's request, a buffer area is still required to anonymise the locations please could this buffer be limited to 50m at most as this would then align with the 50m source protection zone that the EA would require.

I also recognise that this request is likely to entail a lot of work, if there is anything I can do to assist further or help this process, please do let me know.

Kind regards,

[redacted]
MSci, RSoBRA, FGS
Principal Geoenvironmental Scientist

Address: Caversham Bridge House, Waterman Place, Reading, RG1 8DN
[redacted]

Proud to Support Pride@Stantec

Stantec

From: [redacted]
Sent: 04 October 2024 14:16
To:
Cc: [redacted]

[redacted]
Subject: RE: Freedom of Information Request - East Pye Solar

Here you go – the yellows contain PWS supplies that we are aware of, we had 35 records (supplies) in total, it is possible there may be some we are not aware off.

[redacted]
Senior Environmental Management Officer
[redacted]

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From: [redacted]
Sent: Thursday, October 3, 2024 8:25 AM
To: [redacted]
Cc: [redacted]
Subject: RE: Freedom of Information Request - East Pye Solar

Hi [redacted]

Thanks for the below.

Even a rough idea, e.g., a point that has been anonymised within a 20m radius, would be very helpful.

Kind regards,

[redacted]
MSci, RSoBRA, FGS
Principal Geoenvironmental Scientist

Address: Caversham Bridge House, Waterman Place, Reading, RG1 8DN
[redacted]

Proud to Support Pride@Stantec

Stantec

From: [redacted]
Sent: Wednesday, October 2, 2024 2:29 PM
To: [redacted]
Subject: RE: Freedom of Information Request - East Pye Solar

You don't often get email from [redacted] Learn why this is important

We have been advised in the past that we should not provide grid references for boreholes as they would identify residential properties. We would not necessarily know the stratum used for abstraction either most PWS owners do not know this information themselves. I could give you rough areas where we are aware of private supplies but the not precise location.

[redacted]
Senior Environmental Management Officer
[redacted]

From: [redacted]
Sent: Wednesday, October 2, 2024 12:31 PM
To: [redacted]
Cc: [redacted]
Subject: RE: Freedom of Information Request - East Pye Solar

Good Afternoon [redacted]

Thanks for your swift response below.

Regarding the private water supplies, we are required under Environment Agency guidance to assess potential risks to private water supplies, if such features are present. For this, we only need to know the location of the abstraction points and the stratum from which water is abstracted, and do not need any information relating to the owner/operator of the private abstractions.

Please could you advise what data you are able to provide in this regard to enable us to discharge our duties in line with EA guidance.

Kind regards,

[redacted]
MSci, RSciBRA, FGS
Principal Geoenvironmental Scientist

Address: Caversham Bridge House, Waterman Place, Reading, RG1 8DN

[redacted]

Proud to Support Pride@Stantec

Stantec

From: [redacted]
Sent: Wednesday, October 2, 2024 11:58 AM
To: [redacted]
Cc: [redacted]
Subject: FW: Freedom of Information Request - East Pye Solar

Good Morning all,

Thank you for your email:

- Land within 250m of the Site which has been classified as Contaminated Land (including ground investigated or designated under Part 2A) and any associated enforcement (e.g. remediation) and prohibition notices.

  No land which has been formally determined as Contaminated Land as defined in Part 2A of the Environmental Protection Act 1990 (as amended)

- Water abstractions, including any private water supplies registered pursuant to the provisions of the Private Water Supply Regulations 2016, within 250m of the Site.

  Information relating to large scale abstraction is held by the Environment Agency. We hold records of Private Water Supplies but have been advised that we are unable to release this information as it enable identification of personal data under GDPR.

- Any known animal burial sites pursuant to the provisions of the Animal Health Act 1981 and the Animals (Miscellaneous Provisions) Order 1927, within 250m of the Site.

  This is not information we currently hold – we would recommend yout contact APHA - Animal and Plant Health Agency - GOV.UK (www.gov.uk)

- Any records of ground instability (e.g., due to subsidence, ground collapse due to soluble bedrock etc.) within 250m of the Site.

  This is not information we currently hold – see BGS records.

- Any relevant ground conditions information that may impact the Proposed Development.

  No relevant records.

Kind regards

[redacted]

[redacted]
Senior Environmental Management Officer
[redacted]

Our Broadland and South Norfolk Councils offices are now based at Broadland Business Park in the Horizon Centre.
Find out how you can access our services by visiting our website or by calling us on 01508 533633

From: [redacted]
Sent: Thursday, September 26, 2024 3:43 PM
To: FOI (BDC) <foi.bdc@southnorfolkandbroadland.gov.uk>; FOI (SNC) <foi.snc@southnorfolkandbroadland.gov.uk>
Cc: [redacted]
Subject: Freedom of Information Request - East Pye Solar

Good Afternoon,

We are currently carrying out a Phase 1 Ground Conditions Assessment (Desk Study) for a Site located between Sneath Common and Seething, in Norfolk. A copy of the site boundary is attached. For clarity the site includes both the red-ringed land parcels and the red-shaded cable route corridors. I have also attached a shapefile of the boundary to assist you.

We would be grateful if you could carry out a search of your records for any environmental information relating to the site or within 250m. We are particularly interested in any issues concerning:

- Land within 250m of the Site which has been classified as Contaminated Land (including ground investigated or designated under Part 2A) and any associated enforcement (e.g. remediation) and prohibition notices.
- Water abstractions, including any private water supplies registered pursuant to the provisions of the Private Water Supply Regulations 2016, within 250m of the Site.
- Any known animal burial sites pursuant to the provisions of the Animal Health Act 1981 and the Animals (Miscellaneous Provisions) Order 1927, within 250m of the Site.
- Any records of ground instability (e.g., due to subsidence, ground collapse due to soluble bedrock etc.) within 250m of the Site.
- Any relevant ground conditions information that may impact the Proposed Development.

Kind regards,

[redacted]
MSci, RSoBRA, FGS
Principal Geoenvironmental Scientist

Address: Caversham Bridge House, Waterman Place, Reading, RG1 8DN
[redacted]

Proud to Support Pride@Stantec

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Atención: Este correo electrónico proviene de fuera de Stantec. Por favor, tome precauciones adicionales.

Annex 5 Regulatory Consultation Responses – Environment Agency and Animal and Plant Health Agency

From: Enquiries_EastAnglia <Enquiries_EastAnglia@environment-agency.gov.uk>
Sent: 17 October 2024 09:30
To: [redacted]
Subject: East Pye Solar, site located between Sneath Common and Seething, Norfolk - Our ref: EAn/2024/378627
Attachments: 378627 Reply.pdf; EAn_2024_378627 240927_LG15 17102024.xlsx

Follow Up Flag: Follow up
Flag Status: Flagged

Dear [redacted]

Please see attached our response in relation to your enquiry of 26 September 2024.

Regards

[redacted]
Customers & Engagement Officer, Customers & Engagement Team,
Environment Agency East Anglia Area

Internal use only [redacted]
External customers: enquiries_eastanglia@environment-agency.gov.uk
Internal: 55472
External: 02030 255472

If you use the Defra **Data Sharing Platform** (DPS) you can use this link to find out about new and updated datasets and much more. Not using DPS yet? **Register for an account** here and you will receive email notifications direct.

creating a better place

Environment Agency

[redacted]
Stantec
[redacted]

Our ref EAn/2024/378627

Date 17 October 2024

Dear [redacted]

Enquiry regarding site located between Sneath Common and Seething, in Norfolk

Thank you for your enquiry of 26 September 2024.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

Please see attached spreadsheet detailing active IPPC authorisations, historic landfills and waste management licences in the area of interest.

As none of the landfill sites are current, there is no monitoring information to provide. We do not hold any monitoring information for the historic landfills.

The majority of the IPPC authorisations are for intensive agriculture sites.

We can confirm that there are no RSA Authorisations inside the land parcels and cable corridors or within 250 metres of these areas.

Location data for all Intensive farms and other installation sites is publicly available https://environment.data.gov.uk/public-register/downloads/industrial-installations

Part B environmental permits are regulated by the local authority, so please contact them for this information.

According to our records, there are no prosecutions, enforcement or prohibitions for the area.

You can also find the data relating to issues you are concerned with using the public register: https://environment.data.gov.uk/public-register/view/search-all and the register of enforcement actions https://environment.data.gov.uk/public-register/view/search-enforcement-action.

The following sites within 250 m of the site have been reviewed with respect to Land Contamination, and all documents including our responses relating to the sites can be found via the South Norfolk District Council planning website under the following planning references:

- 2008/0917/F, Land at Busseys Loke, Hempnall
- 2013/0105, Land surrounding Busseys Loke, North of Bungay Road, Hempnall
- 2011/1861, Land surrounding Busseys Loke, North of Bungay Road, Hempnall
- 2021/0515, Poultry Farm Road, Green Hempnall NR15 2NH

East Anglia Area
Ipswich Office, Iceni House, Cobham Road, Ipswich, Suffolk, IP3 9JD
Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE
General Enquiries: 03708 506506
Email: enquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

- 2013/0199, Land East of Long Stratton Village, Ipswich Road, Long Stratton
- 2020/2338, Grange Farm, Lundy Green, Hempnall, Norfolk, NR15 2NX
- No Reference number , Land at Busseys Loke, Hempnall

There is also the following site investigation which we do not have an electronic copy of. This investigation is also outside the retention period so it is unlikely information would be held in paper form and any information may be out of date. If you need us to review the paper file please let us know:

- N0020 Hardwick Airfield (from 1992)

The Local Authority will be able to advise on matters relating to human health.

According to our records, there are no abstraction licenses within the shapefile area and none within a 250m buffer.

Certain private and small water supplies do not require a licence to abstract water; therefore, we are not necessarily aware of their existence. The locations of private domestic sources may be held by the local authority on the register required by Regulation 14 Private Water Supplies Regulations 2016. Further details on regulating private water supplies are available on the drinking water inspectorate website (https://www.dwi.gov.uk/private-water-supplies/).

We have no specific information on animal burials. We suggest you contact the Animal and Plant Health Agency (who enforce the Animal By-Product Regulations), or the Local Authority.

Please read the Open Government Licence: www.nationalarchives.gov.uk/doc/open-government-licence/version/3/ which explains the permitted use of this information.

Please get in touch if you have any further queries or contact us within two months if you would like us to review the information we have sent.

We deal with requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 (EIR). The Act requires that we respond to requests by advising you whether or not information is held, and if so by providing you with that information.
EIR Regulation 3(2) states that information is held if it is in our possession and has been produced or received by us, or it is held by another person on our behalf at the time the request is received.

Information not held by us
In this case, the Part B environmental permits and animal burial information you have requested is not held by the Environment Agency, and we are therefore refusing your request on the grounds that there is no information we can provide.

Where a request is for environmental information, the Regulations allow us to refuse to disclose it if the exception at EIR Regulation 12(4)(a) applies. The regulation states that a public authority may refuse to disclose environmental information to the extent that it does not hold that information when an applicant's request is received.

It is not possible for us to conduct a public interest balancing test because the reason for non-disclosure is that the information is not held.

Information held by South Norfolk Council & Animal and Plant Health Agency
We believe that the information you have requested is held by South Norfolk Council & Animal and Plant Health Agency. If you wish us to pass on your request please let me know. If you would rather approach that body yourself, the contacts details are:

South Norfolk Council
Contact us | Broadland and South Norfolk (southnorfolkandbroadland.gov.uk)

Animal and Plant Health Agency
Contact APHA - GOV.UK (www.gov.uk)

Rights of appeal
If you are not satisfied you can contact us within 2 calendar months to ask for our decision to be reviewed. We shall review our response to your request and give you our decision in writing within 40 working days.

If you are still not satisfied following this, you can raise a concern with the Information Commissioner, who is the statutory regulator for Freedom of Information and the Environmental Information Regulations. The contact details are:

Information Commissioner's Office
Wycliffe House
Water Lane
Wilmslow
Cheshire
SK9 5AF
[redacted]
Website: http://ico.org.uk
www.ico.org.uk/foicomplaints

Yours sincerely

[redacted]

Customers & Engagement Officer

Customers and Engagement Team
[redacted]

Waste Mar	Facility typ	Facility type description
70496	SR/21	SR2011 No 3: Vehicle Depollution Facility <5000 tps
70518	A13	A13 : Household Waste Amenity Site
71361	A19	A19 : Metal Recycling Site (Vehicle Dismantler)
71415	A19	A19 : Metal Recycling Site (Vehicle Dismantler)

EPR licence number	Site name	National Grid Reference
EA/EPR/AP3499NU	[redacted]	TM3071495938
EA/EPR/CB3800KU	NORSE ENVIRONMENTAL WASTE SERVICES LIMITED	TM2205194253
EA/EPR/XP3494NA	[redacted]	TM2482093585
EA/EPR/HP3794NK	[redacted]	TM2521696150

Historic Landfill Dataset reference	Site name	NGR
EAHLD02920	Off West side of Shelton Airfield Disused	TM6243029100
EAHLD02930	Off B1135	TM6218029430

Permit number	Installation name	Grid Reference of site entrance
UP3231MJ	Firs Field Farm Duck Unit - EPR/UP3231MJ	TM25159365
BP3943QS	Grange Farm Poultry Unit EPR/ZP3631MF	TM23779219
WP3438NR	Lost Lands Farm Poultry Unit - EPR/WP3438NR	TM17608890
RP3531AZ	Hempnall Poultry Farm EPR/RP3531AZ	TM25579366
RP3129SN	The Mill	TM20809210
HP3628SC	Spring Farm	TM25269219
TP3431HD	Littlebeck Poultry Farm EPR/TP3431HD	TM28769767
ZP3631MF	Grange Farm Poultry Unit	TM23779219
CP3333UA	Hardwick Farm Poultry Unit	TM24509024
BP3830UY	Shelton Farm	TM23199018
VP3138FM	Friars Farm	TM21639257
RP3129SN	The Mill	TM20809210
FP3932QL	Kates Hole Site	TM19429374
VP3433CY	Picton Farms Poultry Unit	TM18709340
JP3938JC	Wild Rose Poultry Farm	TM19209050

From: SM-APHA-CSC One Health ABP <CSCOneHealthABP@apha.gov.uk>
Sent: 21 October 2024 13:09
To: [redacted]
Cc: SM-APHA-Customer Advice; [redacted]
Subject: RE: Environmental Information Request - East Pye Solar
Attachments: AB142.doc

Good Afternoon [redacted]

ANIMAL HEALTH ACT 1981
ANIMALS (MISCELLANEOUS PROVISIONS) ORDER 1927

Thank you for your enquiry of 21/10/24. There is no register of animal burial sites to assist with your enquiry therefore the Animal & Plant Health Agency is not in a position to give reassurance in respect of the suitability of the land in question.

If burial sites are disturbed, there may be implications under the Control of Pollution Act and in this respect I suggest that you contact the appropriate authority.

In the event that animal remains are discovered in the course of land excavation, work should cease immediately and you should report the occurrence or your suspicions to this office. A licence will be required under the above legislation to enable excavation and subsequent disposal of the remains in a line with Animal By-products regulations.

I have enclosed a copy of the Guidelines for Exhumation and Disposal of Animal Carcasses (AB142) for your information.

Please do not hesitate to contact me if further assistance is required.

Kind regards,

[redacted]

AO

Animal By Products (ABP) Team

Normal working pattern Mon-Fri 8am – 1pm

Animal and Plant Health Agency (APHA)
Telephone: [redacted] | Email: CSCOneHealthABP@apha.gov.uk
Website: www.gov.uk/apha | Twitter: @APHAgovuk | Facebook: aphagov
Address: Customer Service Centre – Business Support, Worcestershire County Hall
Spetchley Road, Worcester, WR5 2NP

From: SM-APHA-Customer Advice <customeradvice@apha.gov.uk>
Sent: 19 October 2024 15:27
To: SM-APHA-CSC One Health ABP <CSCOneHealthABP@apha.gov.uk>
Subject: FW: Environmental Information Request - East Pye Solar

Would this be a query you can help with.

Regards

[redacted]
Customer Advice Team

From: [redacted]
Sent: 18 October 2024 17:00
To: SM-APHA-Customer Advice <customeradvice@apha.gov.uk>
Cc: [redacted]
Subject: Environmental Information Request - East Pye Solar

You don't often get email fro[redacted] Learn why this is important

Good Afternoon,

We are currently carrying out a Phase 1 Ground Conditions Assessment (Desk Study) for a Site located between Sneath Common and Seething, in Norfolk. A copy of the site boundary is attached. For clarity the site includes both the red-ringed land parcels and the red-shaded cable route corridors. I have also attached a shapefile of the boundary to assist you.

We have previously contacted the Environment Agency regarding animal burials. The EA suggested we contact yourselves in this regard (see EA enquiry response attached).

We would be grateful if you could carry out a search of your records for any known animal burial sites pursuant to the provisions of the Animal Health Act 1981 and the Animals (Miscellaneous Provisions) Order 1927 within, and within 250m of the attached red-line boundary.

Kind regards,

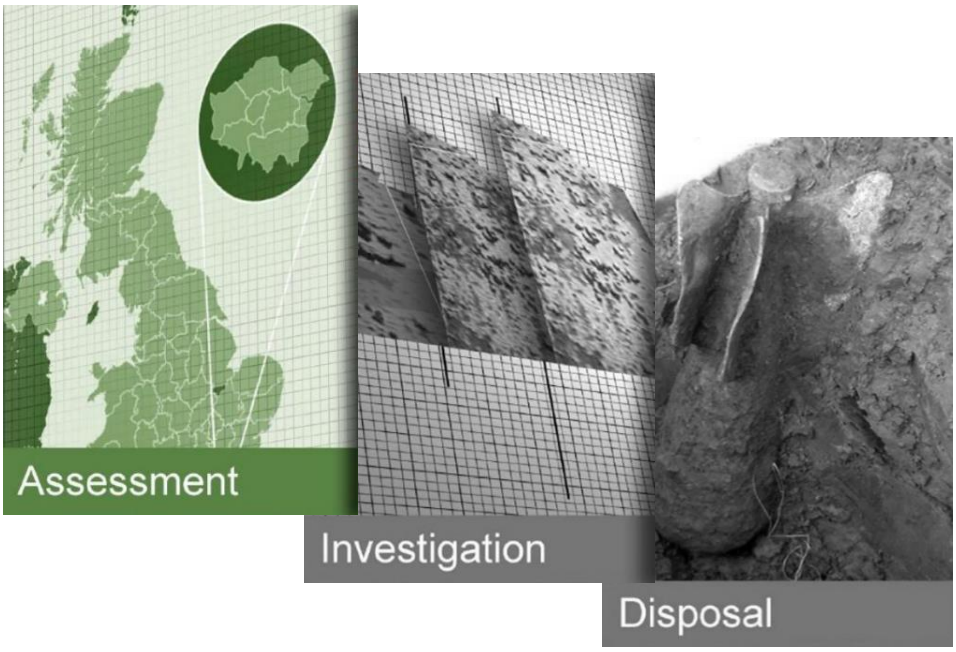
[redacted]
MSci, RSoBRA, FGS
Principal Geoenvironmental Scientist

Address: Caversham Bridge House, Waterman Place, Reading, RG1 8DN
[redacted]

Proud to Support Pride@Stantec

Stantec

Annex 6 UXO Desk Study and Constraints Assessment



UXO Desk Study & Constraints Assessment

Document Ref.	**P14931-24-R1**
Revision	**A**
Project Title	**Long Stratton to East Pye**
Client	**Stantec**
Date	**4th November 2024**

Drafted by	[redacted]
Checked by	
Authorised by	

UXO DESK STUDY & CONSTRAINTS ASSESSMENT

EXECUTIVE SUMMARY

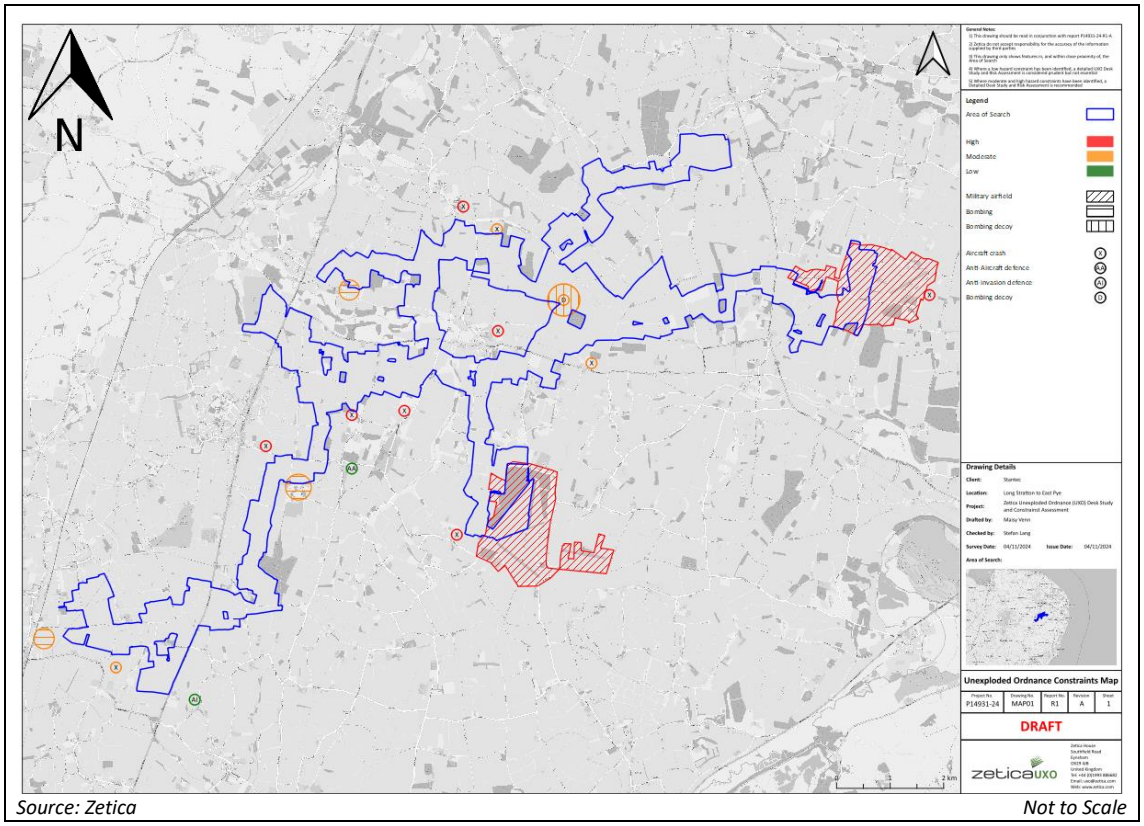
Zetica Ltd was commissioned by Stantec to carry out a detailed Unexploded Ordnance (UXO) Desk Study and Constraints Assessment for an area of approximately 2,216 hectares (ha) area in the vicinity of Long Stratton, Hempnall, and Woodton, in South Norfolk.

The aim of this report is to gain a fair and representative view of the UXO hazard constraints for the Area of Search in accordance with the Construction Industry Research and Information Association (CIRIA) C681, 'Unexploded Ordnance (UXO), a Guide for the Construction Industry'.

The main potential UXO hazard constraints in and within close proximity of the Area of Search are shown on the accompanying P14931-24-R1-MAP01-A.

The Figure below, reproduced as Figure 4 in the main report, illustrates the main UXO hazard constraints identified.

UXO hazard constraints in and within close proximity of the Area of Search



Source: Zetica *Not to Scale*

The main findings of the report are summarised below.

Wartime bombing

- No significant World War One (WWI) bombing has been identified in the Area of Search.
- World War Two (WWII) bombing densities in the Area of Search were generally low. Several instances of United States Army Air Force (USAAF) aircraft jettisoning bombs in and within close proximity to the Area of Search have been recorded.
- Records also indicate that there was 1No. bombing decoy within the Area of Search.

Military airfields & aircraft crashes

- 2No. WWII-era bomber airfields were identified within the Area of Search.

- There were at least 9No. aircraft crashes in and within close proximity to the Area of Search during WWII, some of which may provide a constraint to development.

Military defences

- During WWII Anti-Aircraft (AA) and anti-invasion defences were established in and within close proximity to the Area of Search to counter bombing raids and the threat of invasion. These included AA searchlights and pillboxes.

For the majority of the Area of Search, evidence indicates that the risk of a UXO hazard being present owing to local military activity is low. There is credible evidence to conclude that at discrete locations, a moderate to high UXO hazard level may exist, especially within the boundaries of former or current military establishments such as airfields and defensive installations.

RECOMMENDATIONS

Avoidance

Where possible, the proposed route corridor options should be diverted around the identified UXO hazard constraints.

UXO Desk Study and Risk Assessment

Once a preferred route option(s) has been selected, it is recommended that a detailed UXO desk study is commissioned to confirm the UXO hazard level along the route.

Risk mitigation plan

Where a potential UXO hazard is identified by the desk study and risk assessment, UXO risk mitigation measures will be recommended for the intended types of development and common working practices.

Non-intrusive geophysical surveys can be undertaken to further delineate the potential UXO hazard along the preferred route options, whilst also identifying other buried hazards and features such as archaeology, changes in ground conditions, buried obstructions and utilities.

What do I do next?

If you have any questions or wish to discuss recommendations, contact us and we can help.

	**01993 886682**		**uxo@zetica.com**		**zeticauxo.com**

If you have requirements to identify other buried hazards (such as mapping utilities or obstructions) we can provide these surveys.

If the boundary of the Area of Search changes, or additional works are planned, contact Zetica for a re-assessment of the UXO risk and the risk mitigation requirements.

CONTENTS

Figures, Plates, & Tables

Accompanying GIS Data

P14931-24-R1-MAP01-A (UXO Desk Study & Constraints Assessment)

ABBREVIATIONS

AA	Anti-Aircraft
ALARP	As Low As Reasonably Practicable
AP	Anti-Personnel
ARP	Air Raid Precaution
AXO	Abandoned Explosive Ordnance
BGS	British Geological Survey
CIRIA	Construction Industry Research and Information Association
DCLG	Department of Communities and Local Government
EO	Explosive Ordnance
EOC	Explosive Ordnance Clearance
EOR	Explosive Ordnance Reconnaissance
ERW	Explosive Remnants of War
ESA	Explosive Substances and Articles
HAA	Heavy Anti-Aircraft
HE	High Explosive
HER	Historic Environment Record
IB	Incendiary Bomb
IWM	Imperial War Museum
LAA	Light Anti-Aircraft
MoD	Ministry of Defence
MU	Maintenance Unit
NARA	National Archives & Records Administration
NCAP	National Collection of Aerial Photography
OB	Oil Bomb
OSNGR	Ordnance Survey National Grid Reference
PM	Parachute Mine
RAF	Royal Air Force
RE	Royal Engineers
SAA	Small Arms Ammunition
USAAF	United States Army Air Force
UXAA	Unexploded Anti-Aircraft
UXB	Unexploded Bomb
UXO	Unexploded Ordnance
WO	War Office
WWI	World War One
WWII	World War Two
ZAA	Rocket Anti-Aircraft

UXO DESK STUDY & CONSTRAINTS ASSESSMENT

Please read: Zetica has colour coded each paragraph. Paragraphs with black text on a white background provide Area of Search-specific information or information specifically researched as part of this project.

Boxed paragraphs in a dark green text with a green background provide general information and, where appropriate, links to online resources giving further detail. These are all available at www.zeticauxo.com. If you cannot gain access to these resources, Zetica can forward them on request.

1 INTRODUCTION

1.1 Project outline

Zetica Ltd was commissioned by Stantec to carry out a detailed Unexploded Ordnance (UXO) Desk Study and Constraints Assessment for an area of approximately 2,216 hectares (ha) in the vicinity of Long Stratton, Hempnall, and Woodton, in South Norfolk (the 'Area of Search').

The aim of this report is to gain a fair and representative view of the UXO hazard constraints for the Area of Search in accordance with the Construction Industry Research and Information Association (CIRIA) C681 'Unexploded Ordnance (UXO), a Guide for the Construction Industry'.

It should be noted that some military activity providing a source of UXO hazard constraint may not be recorded and therefore there cannot be any guarantee that all UXO hazard constraints affecting the Area of Search have been identified in this report.

This report is intended to provide 'high level' information of potential UXO hazard constraints as a result of military activity within the defined Area of Search. The UXO hazard constraints identified within the defined Area of Search and described in this report are based on the experience of Zetica Ltd for other military establishments elsewhere in the UK.

The actual activities on any establishment will vary and further, more detailed study will be required during the subsequent stages of the proposed route design and construction process where the proposed route options actually impacts on these hazards.

At this stage, the UXO hazard ranking is indicative only. The hazard level of a potential source of UXO hazard can be further determined as part of a detailed desk study once route selection has been completed.

Where appropriate, this hazard assessment includes:

- Likelihood of ordnance being present.
- Type of ordnance (size, filling, fuze mechanisms).
- Quantity of ordnance.
- Potential for live ordnance.
- Probable location.
- Ordnance condition.

It should be noted that some military activity providing a source of UXO hazard may not be recorded and therefore there cannot be any guarantee that all UXO hazards affecting the Area of Search have been identified in this report.

1.2 The Area of Search

The Area of Search comprises approximately 2,216 hectares (ha) in South Norfolk, as defined by the following Ordnance Survey National Grid References (OSNGRs):

North: TM 279983 (Brooke)

West: TM 165890 (Monlton St. Michael)

Centre: TM 254951 (North Hempnall)

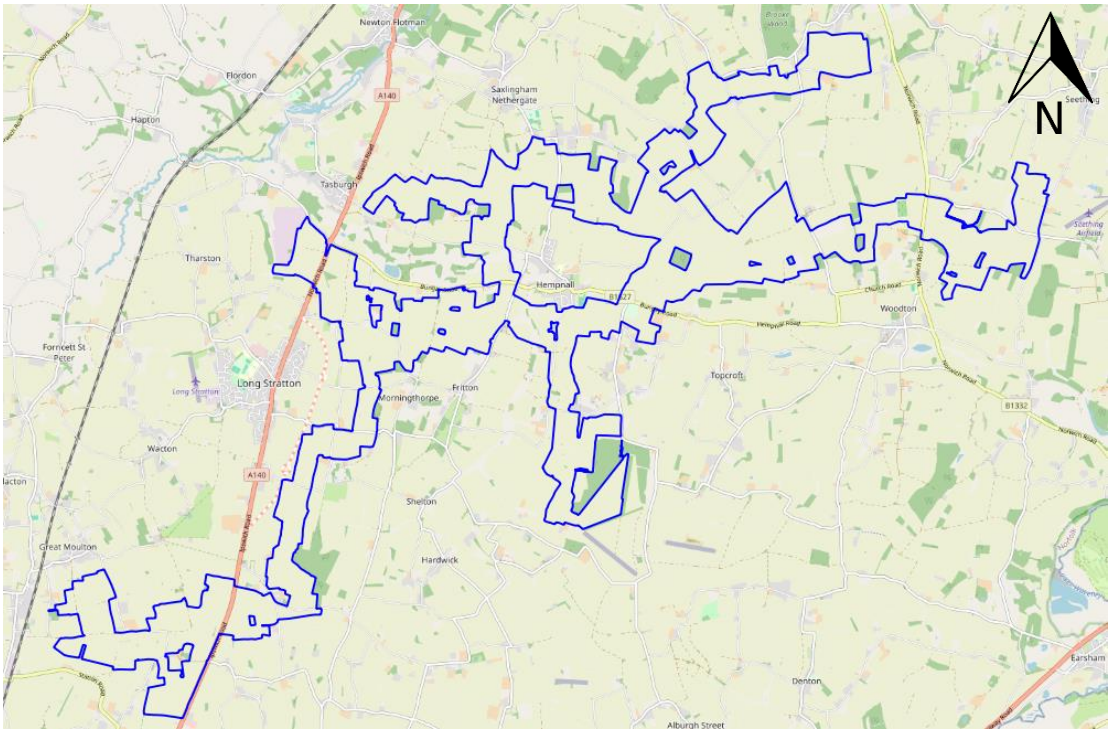
East: TM 312956 (Seething)

South: TM 182874 (Tivetshall St Margaret)

The areas referred to in this report are shown on P14931-24-R1-MAP01-A. Specific locations within the Area of Search are referred to by geographic local names and by approximate OSNGRs where appropriate.

Figure 1 is a location map of the Area of Search and Plate 1 is a recent satellite image of the Area of Search.

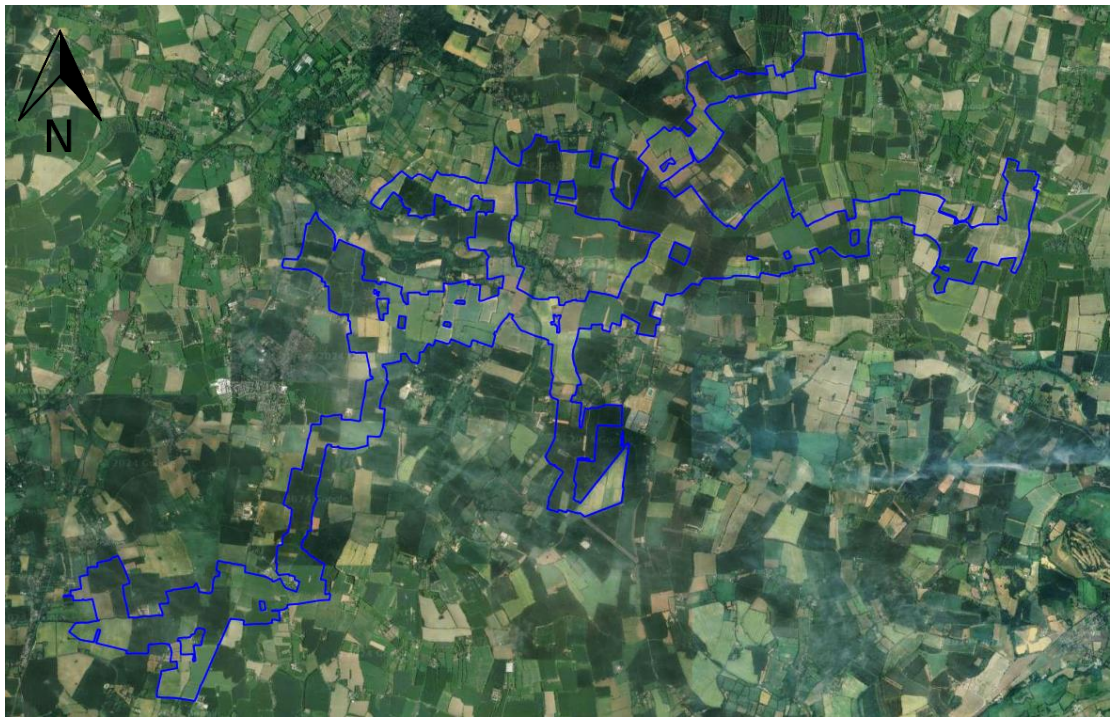
Figure 1 Map of the Area of Search



Source: OpenStreetMap *Not to Scale*

Legend	Area of Search

Plate 1 Recent satellite image of the Area of Search



Source: Google Earth *Not to Scale*

Legend	Area of Search

2 RESEARCH

2.1 Sources of information

Zetica Ltd researched the World War One (WWI)/World War Two (WWII) bombing and military history of the Area of Search and its surrounding area using a range of information sources. The main sources of information are detailed in the following sections and referenced at the end of this report.

1.2.1 Zetica Ltd records

Zetica Ltd's in-house records were consulted, including the Zetica Ltd bomb risk maps (http://zeticauxo.com/downloads-and-resources/risk-maps/), previous requests for information from government bodies, reference books, and archive materials from past work in the region.

Relevant documents have been cited in the bibliography of this report.

1.2.2 Historical records, maps, and drawings

Numerous reference documents including historical maps, aerial photographs and drawings have been consulted from sources such as the National Archives, the US National Archives & Records Administration (NARA), the Imperial War Museum (IWM), Historic England, National Collection of Aerial Photography (NCAP), the Defence of Britain Project, the Royal Air Force (RAF) Museum), the Airfield Research Group, the American Air Museum, The Pillbox Study Group, The Second World War Experience Centre, the Society for Army Historical Research, Subterranea Britannica, The UK Fortifications Club, and relevant archaeological bodies.

The British Geological Survey (BGS) was consulted for borehole information.

1.2.3 Local records

Norfolk County Council, Norfolk Record Office, local historical groups, local newspapers, and the Norfolk Historic Environment Record (HER) were consulted for records.

2.2 Data confidence level

In general, there is a high level of confidence in the researched information sources used for this report. Further detail is given in the text of the report where appropriate.

Definitions of data confidence level		
Data Confidence Level		**Definition**
	Low	There are very few sources of information, and/or those available are lacking in detail.
	Moderate	There is a limited range of available sources of information, a key source of information is missing, and/or some sources may be contradictory or lacking in detail.
✓	**High**	There is a wide range of available sources of information, which are detailed and corroborate each other.

3 MILITARY ACTIVITY

The following sections outline the recorded military activity in and within close proximity to the Area of Search. The potential UXO hazard constraints from WWI and WWII bombing are detailed in Section 4.

3.1 Military airfields

For further information on military airfields, and the potential UXO hazards associated with them, follow the link below:

- Military Airfields

2No. military airfields have been identified within the Area of Search. These are described below.

3.1.1 RAF Seething/United States Army Air Force (USAAF) Station 146

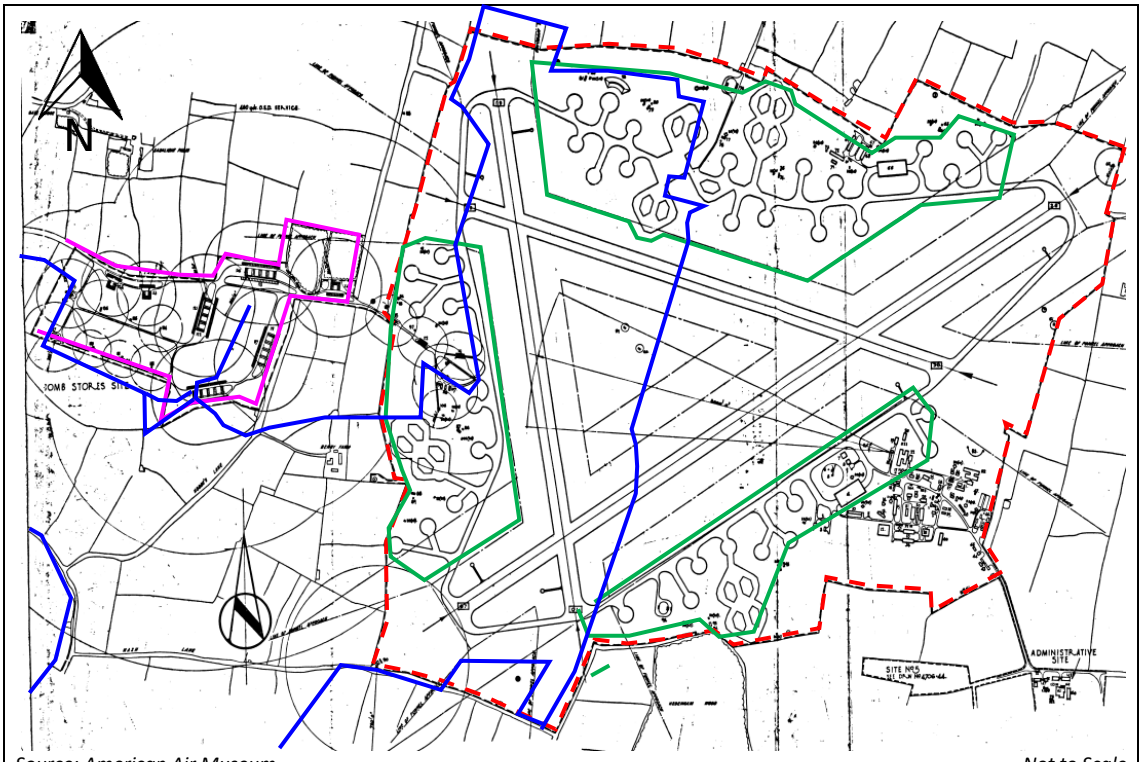
Between 1942 and 1943, RAF Seething was established on land encroaching onto the eastern part of the Area of Search (TM 308954).

The airfield comprised 3No. concrete runways, 17No. bomb and ammunition stores, 2No. T-2 hangars, and several dispersed administrative areas.

On the 1st December 1943, RAF Seething was handed to the USAAF. It was designated USAAF Station 146 and used by the 448th Bombardment Group, flying the Consolidated B-24 Liberator heavy bomber aircraft.

Figure 2 is a plan of USAAF Station 146, dating from November 1944. Several airfield features have been identified.

Figure 2 Plan of USAAF Station 146, November 1944



Source: American Air Museum *Not to Scale*

Legend	Area of Search	Airfield boundary
	Dispersal areas	Bomb stores

In June 1945, the 448th Bombardment Group left USAAF Station 146 and the station was handed back to the RAF

In late 1945, RAF Seething accommodated Nos. 53 and 94 Maintenance Unit (MU).

By 1946, RAF Seething had closed. The majority of the airfield reverted to agricultural use. The eastern section, including part of the main runway, became Seething Airfield. It is used by the Waveney Flying Group.

3.1.2 RAF Hardwick/USAAF Station 104

Between 1941 and 1942, RAF Hardwick was established on land encroaching onto the southern part of the Area of Search (TM 246912).

The airfield comprised 3No. concrete runways, 3No. T-2 hangars, bomb stores, and several dispersed accommodation areas.

In September 1942, RAF Hardwick was handed to the USAAF. It was designated USAAF Station 104 and used by the 310th Bombardment Group, flying the North American B-25 Mitchell medium bomber aircraft.

In December 1942, the 93rd Bombardment Group (Heavy) arrived at USAAF Station 104, flying Consolidated B-24 Liberator heavy bomber aircraft.

From the 7th November 1943, USAAF Station 104 served as Headquarters (HQ) for the 20th Combat Bombardment Wing of the 2nd Bomb Division.

Plate 2 is an aerial photograph dated the 2nd March 1944. Several airfield features have been identified.

Plate 2 Aerial photograph, 2nd March 1944

Source: Historic England *Not to Scale*

Legend	Area of Search	Airfield boundary
	Bomb stores	Dispersal areas

On the 25th June 1945, the airfield was returned to the RAF and reverted to RAF Hardwick. It was placed into care and maintenance status.

In 1962, RAF Hardwick closed, and the main airfield buildings and hangars were demolished. Some of the smaller buildings remain extant and are used by commercial businesses.

Military airfields provide a high UXO hazard constraint. Bomb stores and aircraft dispersal areas have been identified in the Area of Search, which both provide potential UXO hazards.

Airfields within the Area of Search are identified on the accompanying P14931-24-R1-MAP01-A.

3.2 Aircraft crashes

For further information on military aircraft crashes, and the potential UXO hazards associated with them, follow the link below:

- Aircraft Crashes

No WWI aircraft crashes have been identified in the Area of Search.

During WWII, at least 9No. aircraft crashed in and within close proximity to the Area of Search. Given the 2No. USAAF bomber command stations encroached onto the Area of Search (see Section 3.1), these crashes were predominantly bomber aircraft.

Some of the WWII crashes may have had live munitions on board, which could have scattered across a wide area. This would typically have comprised Small Arms Ammunition (SAA) for machine guns, and cannon shells for those aircraft arms with cannons. Some of the crashed aircraft may also have been carrying a bomb load, potentially resulting in Unexploded Bombs (UXBs) falling on or near the crash site.

Plate 3 is a photograph of a crashed B-24 Liberator bomber aircraft. The aircraft crashed on take-off at USAAF Station 104 (see Section 3.1.2), potentially in the Area of Search, on the 3rd May 1944.

Plate 3 Photograph of crashed B-24 Liberator, 3rd May 1944

Source: American Air Museum *Not to Scale*

Post-WWII at least 1No. aircraft crashed in close proximity of the Area of Search. These crash sites were usually more thoroughly cleared and are less likely to have munitions on board that could remain undetected in the ground.

Table 1 (Appendix 1) includes known locations of aircraft crashes in and within close proximity of the Area of Search. These are also mapped on the accompanying P14931-24-R1-MAP01-A.

Aircraft crashes frequently occurred on take-off or landing from airfields, particularly during training. It should be assumed that numerous aircraft crashes occurred at military airfields (see Section 3.1). Given this, aircraft crashes that occurred on military airfields have been omitted from Table 1 and the accompanying P14931-24-R1-MAP01-A.

3.3 Anti-invasion defences

For further information on military defences, and the potential UXO hazards associated with them, follow the links below:

- Anti-Invasion Defences
- Home Guard
- Mined Locations
- Mortar & Gun Emplacements
- Pillboxes

During WWII the Area of Search was under control of Eastern Command.

Defences in the area were concentrated around the extensive East Anglian coastline. The flat plains inland offered easy access to the industrial midlands. A dense network of defensive sites was created as part of the anti-invasion preparations, designed to interrupt and delay the progress of any invading force.

The Area of Search was located within between Sector 'D' and Sector 'B' of the 18th Division (Defence).

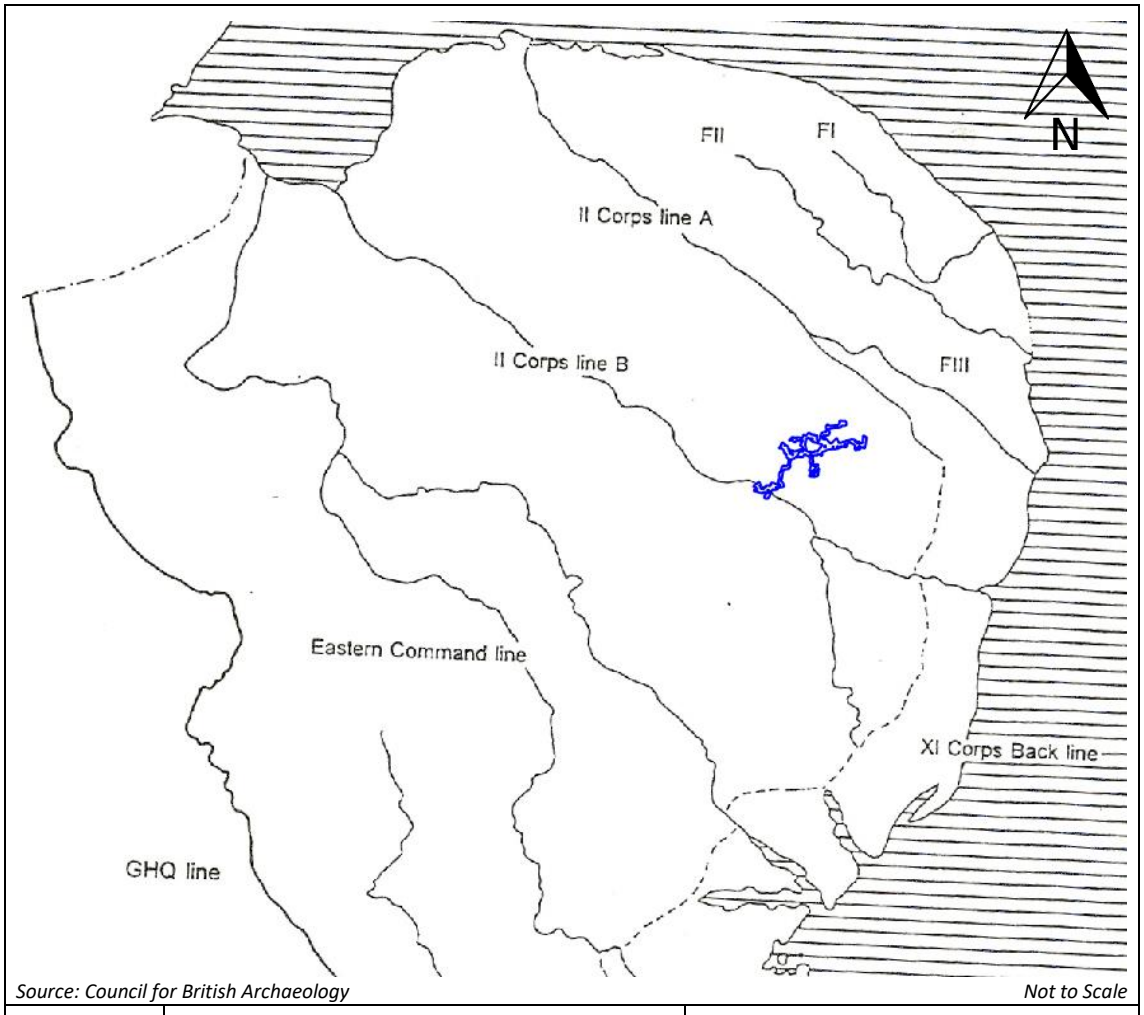
3.3.1 Anti-Invasion defences

Due to Norfolk's vulnerability to invasion, an extensive network of stop lines was established. Stop lines were dense networks of defences, typically comprising fortifications such as pillboxes and coastal batteries. The majority of these fortifications were located along the coast, although many were established near prominent towns, such as Norwich, approximately 10km north of the Area of Search.

Anti-invasion defences were used to protect strategically significant areas, including roads and bridges. Defensive structures such as pillboxes, Anti-Tank (AT) obstacles, and spigot mortar emplacements were common anti-invasion defences.

Figure 3 is a map showing the network of stop lines in Eastern Command, in the vicinity of the Area of Search, 1No. of which encroached onto the southwestern part of the Area of Search.

Figure 3 Map of stop lines in the vicinity of the Area of Search



Source: Council for British Archaeology *Not to Scale*

Legend	Area of Search	Stop lines

No records have been found to suggest that any pillboxes, AT obstacles, or spigot mortar emplacements were established in the Area of Search. Records have been found to indicate that 1No. pillbox was established at Rookery Farm (TM 190874) approximately 0.4km east of the Area of Search.

Pillboxes typically had associated munitions caches and were often manned by the Home Guard (see Section 3.3.2).

Table 2 (Appendix 1) includes known anti-invasion defence structures in and within close proximity of the Area of Search. These are also mapped on the accompanying P14931-24-R1-MAP01-A.

3.3.2 Home Guard and Auxiliary Units

Stop lines and anti-invasion defences were often manned by members of the Home Guard, backed up by regular Army troops wherever possible. The troops were issued with 'No Withdrawal' orders.

During WWII, units of the 3rd Norfolk Battalion Home Guard were active in the vicinity of the Area of Search.

The Home Guard carried out training exercises, using both liver munitions and dry training aids (blanks and pyrotechnics). No records of Home Guard training taking place in or within the vicinity of the Area of Search have been found.

Identified Home Guard battalions known to have been in operation in the vicinity of the Area of Search are listed in Table 3 (Appendix 1).

3.4 Anti-Aircraft (AA) defences

For further information on military defences, and the potential UXO hazards associated with them, follow the links below:

- Anti-Aircraft Guns
- Barrage Balloons
- Bombing Decoys

3.4.1 AA batteries and searchlights

During WWI and WWII there were no AA batteries recorded in the Area of Search.

1No. AA Searchlight was recorded at Morningthorpe (TM 219918), approximately 0.6km east of the Area of Search. Searchlight emplacements typically consisted of a small ring-ditch to provide shelter during an air raid, a predictor emplacement for calculating the range and height of targets, an Light AA (LAA) machine gun pit, a generator, and hutted accommodation.

Plate 4 is an aerial photograph dating from 1946. The searchlight at Morningthorpe has been identified.

Plate 4 Aerial photograph of Morningthorpe searchlight, 1946

Source: Norfolk Historic Map Explorer *Not to Scale*

Legend	Area of Search	Searchlight

Table 4 (Appendix 1) includes known locations of AA defences in and within close proximity to the Area of Search. These are also mapped on the accompanying P14931-24-R1-MAP01-A.

3.4.2 Bombing decoys

During WWII 1No. bombing decoy was located within the Area of Search. Bombing decoys were designed to draw enemy aircraft away from towns and other strategically important targets and would often have associated LAA gun defences.

1No. 'Q-Type' bombing decoy was established at Hempnall, centred on TM 255952, in the Area of Search. It was designated Q172a and active between 18th June 1942 and 12th August 1942. The decoy was designed to replicate an active airfield, to deflect bombing from nearby RAF Hardwick and RAF Seething (see Section 3.1).

Plate 5 is an aerial photograph of Hempnall, dating from 1946.

The location of the decoy has been identified, although no features associated with the decoy can be seen. It is considered likely that these were removed after WWII.

Plate 5 Aerial photograph of Hempnall decoy, 1946

Source: Norfolk Historic Map Explorer *Not to Scale*

Legend	Area of Search	Decoy

Successful bombing decoys can provide a high UXO hazard due to the possibility of UXBs located at depth. No records have been found to indicate the decoy in the Area of Search was successful.

Known bombing decoys in and in the vicinity of the Area of Search are mapped on the accompanying P14931-24-R1-MAP01-A.

4 BOMBING

4.1 WWI bombing

For further information on WWI bombing in the UK, and the potential UXO hazard associated with it, use the following link.

- WWI Bombing

During WWI an estimated 9,000No. German bombs were dropped over Britain. It was the first time that strategic aerial bombing had been used, initially from Zeppelin airships.

No records of WWI bombing in the Area of Search have been found.

4.2 WWII bombing

For further information on WWII bombing in the UK, and the potential UXO hazard associated with it, see Appendix 2.2 or use the following link.

- WWII Bombing

Details of WWII bombing in the vicinity of the Area of Search are provided in the following sections.

4.2.1 Bombing in South Norfolk

Given its predominantly rural nature, Norfolk was generally subjected to few significant bombing raids during WWII and bombing densities for the counties were typically low. Some areas of Norfolk, such as Norwich approximately 10km north of the Area of Search, and Great Yarmouth approximately 24km northeast of the Area of Search, were deliberately targeted due to their important industrial and port facilities.

Operational airfields were also targeted by the Luftwaffe. Records for heavy raids on many of the region's airfields were suppressed until after WWII.

The areas surrounding the Area of Search were subjected to the occasional 'tip and run' bombing raids and aircraft jettisoning bombs on their return flights from strategically important targets further inland.

Given the number of USAAF airfields in and within close proximity to the Area of Search, many US aircraft jettisoned their bombs before returning to their airfields, some of which were recorded in and within close proximity of the Area of Search.

It should be noted that although rural areas were bombed less heavily than urban districts, Air Raid Precaution (ARP) records may under-represent the number and frequency with which bombs fell in rural areas.

4.2.2 Strategic targets

The presence of strategic targets significantly increased the likelihood of bombing within the local area. Airfields, docks, industrial facilities, transport infrastructure and anti-invasion defences were all targeted by Luftwaffe bombers.

During WWII, the Area of Search was rural in nature, with few strategic targets. RAF Hardwick and RAF Seething (see Section 3.1) were the only strategic targets in and within close proximity to the Area of Search.

Plate 6 is a Luftwaffe target photograph of RAF Hardwick (outlined in red) dating from June 1942.

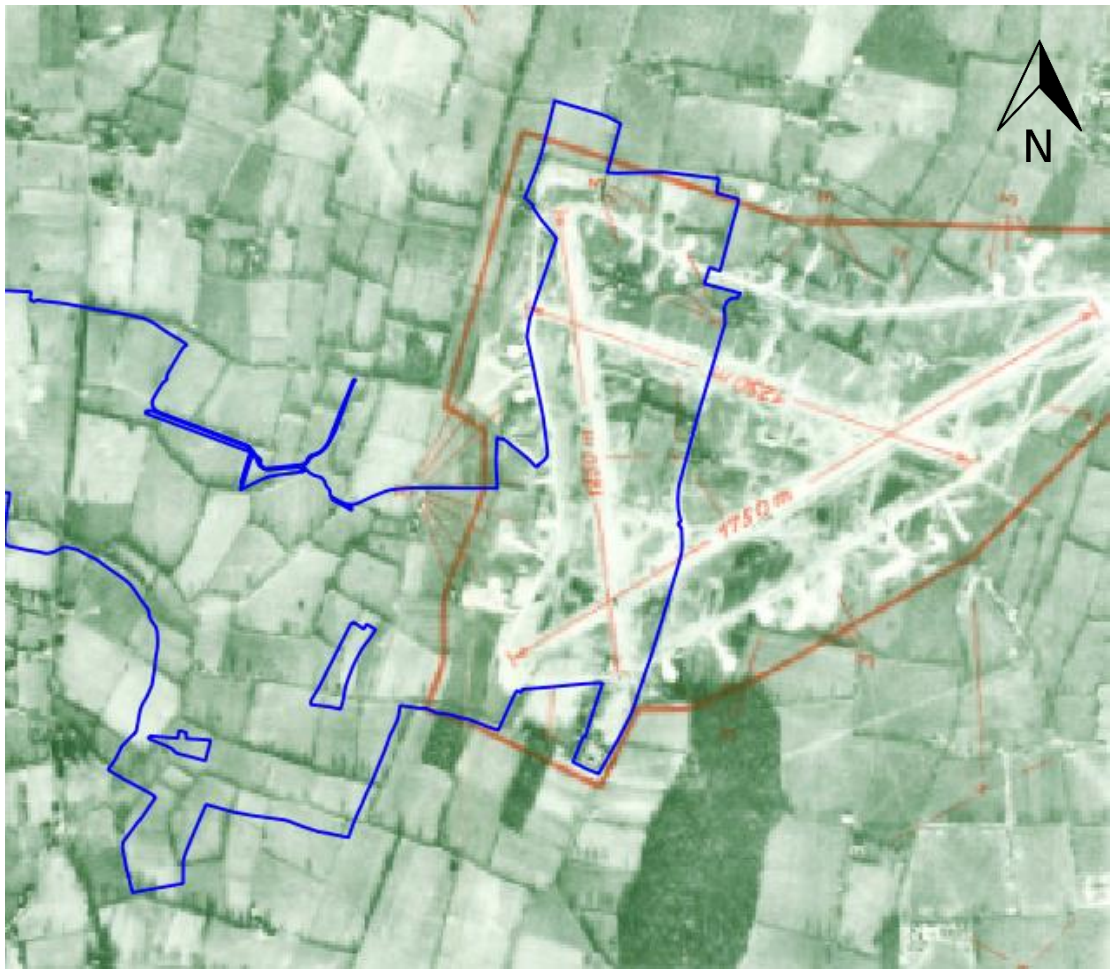
Plate 6 Luftwaffe target photograph of RAF Hardwick, June 1942

Source: NARA *Not to Scale*

Legend	Area of Search

Plate 7 is a Luftwaffe target photograph of RAF Seething (outlined in red) dating from February 1943.

Plate 7 Luftwaffe target photograph of RAF Seething, February 1943



Source: NARA *Not to Scale*

Legend	Area of Search

4.2.3 Bombing densities and incidents

Table 5 (Appendix 1) gives details of the overall bombing statistics recorded for the Local Authority (LA) Districts of the Area of Search. These were categorised as Rural Districts (RD), Urban Districts (UD), Municipal Borough (MB), Metropolitan Boroughs (MetB) and County Boroughs (CB). WWII bomb density levels are defined below:

<5 bombs per 405ha is a Very Low regional bombing density.

5-15 bombs per 405ha is Low.

15-50 bombs per 405ha is Moderate.

50-250 bombs per 405ha is High.

>250 bombs per 405ha is Very High.

Official UK bombing statistics have been compiled from both British and German sources. There were differences in the way the figures were originally reported and collated which has led to discrepancies in the summary data.

Note that Table 5 excludes the figures for Incendiary Bombs (IBs). Discrepancies between the below list and other records, such as bomb clearance records, demonstrate that this data is likely to under-represent actual bombing.

An indicative list of the more significant air raid incidents in and within close proximity to the Area of Search given below.

6th August 1941

10No. High Explosive (HE) bombs fell on Wood Green Farm, Long Stratton, in the Area of Search.

9th May 1944

7No. 1000lb HE US bombs were jettisoned on open ground near Lime Tree Farm, in the Area of Search. These were recorded as Unexploded Bombs (UXBs). The UXBs were taken to RAF Hardwick and disposed of.

30th May 1944

1No. 500lb HE US bomb was jettisoned on open land near Hardwick, in the Area of Search. This was recorded as a UXB and taken to RAF Tibbenham, approximately 1.6km east of the Area of Search, for disposal.

16No. HE US bombs jettisoned on open ground near Sneath Common, approximately 0.4km west of the Area of Search. These were recorded as UXBs and taken to RAF Tibbenham for disposal.

Note that air raid incident reports do not always give precise details of the bombs which fell, often only indicating in which area they fell.

More detailed ARP and LA records would be included as part of a site-specific UXO Desk Study and Risk Assessment.

In general, the WWII bombing densities across the Area of Search were low and it is considered unlikely that a significant UXB hazard exists for the majority of the area. There is the potential for discrete areas to have had a higher WWII bombing density than the regional averages, particularly around military establishments. These areas would be more precisely defined in a detailed UXO Desk Study and Risk Assessment for the chosen route.

4.2.4 Abandoned bombs

No records have been found indicating that any officially abandoned bombs are located in the Area of Search.

5 POST-WWII EXPLOSIVE ORDNANCE CLEARANCE (EOC) ACTIVITIES

Based on data from 1939 to 1945, War Office statistics indicate that 200,195No. HE bombs exploded within Great Britain. Additionally, 25,195No. HE bombs (approximately 11%) were recorded as UXBs. However, records from the Royal Engineers (RE) who were responsible for bomb disposal at the time indicate that by 27th February 1946, more than 45,000No. UXBs were disposed of.

On average, 8.5% of UXBs later self-exploded. In some cases, the bombs had delayed action fuzes or were never intended to explode, their purpose being to cause inconvenience and fear. Given the discrepancy in records and the fact that UXBs are still being found unexpectedly, it is clear that the original figures are understated and provide only an approximation of the number of potential UXBs in the UK.

War Office (WO) statistics also show that between October 1940 and May 1941 most UXBs (93%) were either 50kg or 250kg. It should be noted that details of the recovery and size of the UXB were not always accurately reported.

The larger WWII UXBs are often difficult to recover due to both penetration depths and the presence of two or more fuzes, combined with more sensitive fillings of explosive mixtures including Amatol and Trialen.

5.1 EOC tasks

Zetica holds no records of post-WWII EOC tasks having taken place on or in the vicinity of the Area of Search.

6 UXO HAZARD ASSESSMENT

6.1 UXO hazard level

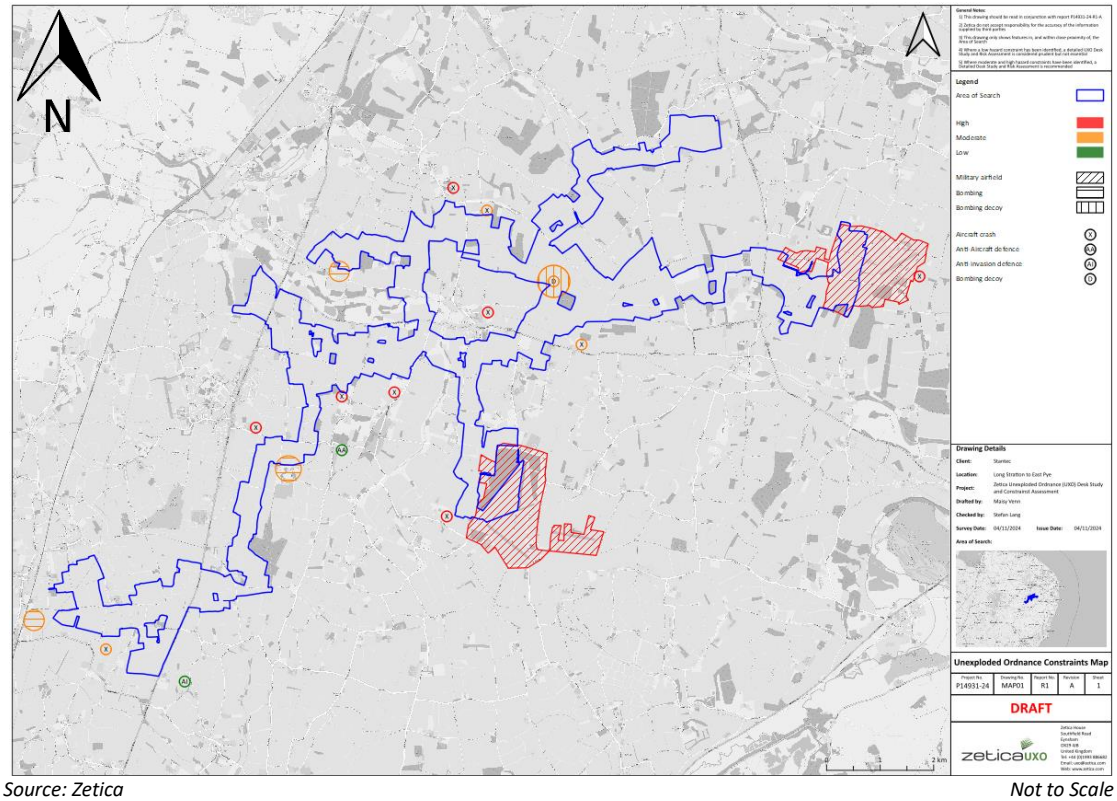
Definitions of UXO hazard constraint level for the Area of Search	
Hazard Level	**Definition**
Low	It is considered unlikely that UXO will be encountered within the footprint of the constraint.
Moderate	Ordnance will have been stored or used within the footprint of the constraint and the potential for UXO to remain cannot be discounted.
High	There is an elevated probability that UXO will be encountered within the footprint of the constraint.

A number of potential UXO hazards which may present a constraint to the Area of Search have been identified. These are shown in Figure 4, also provided as the accompanying P14931-24-R1-MAP01-A.

For the majority of the Area of Search, evidence indicates that the risk of a UXO hazard being present due to local military activity is low. There is credible evidence to conclude that at discrete locations, a moderate to high UXO hazard level may exist, particularly within the boundaries of former or current military establishments.

As with all locations, the potential presence of UXO as a result of enemy action, unauthorised disposal, or unrecorded military activity cannot be totally discounted.

Figure 4 UXO hazard constraints in and within close proximity of the Area of Search



Source: Zetica *Not to Scale*

7 RECOMMENDATIONS

Avoidance

Where possible, the proposed route corridor options should be diverted around the identified UXO hazard constraints.

UXO Desk Study and Risk Assessment

Once a preferred route option(s) has been selected, it is recommended that a detailed UXO desk study is commissioned to confirm the UXO hazard level along the route.

Risk mitigation plan

Where a potential UXO hazard is identified by the desk study and risk assessment, UXO risk mitigation measures will be recommended for the intended types of development and common working practices.

Non-intrusive geophysical surveys can be undertaken to further delineate the potential UXO hazard along the preferred route options, whilst also identifying other buried hazards and features such as archaeology, changes in ground conditions, buried obstructions and utilities.

What do I do next?

If you have any questions or wish to discuss recommendations, contact us and we can help.

	**01993 886682**		**uxo@zetica.com**		**zeticauxo.com**

If you have requirements to identify other buried hazards (such as mapping utilities or obstructions) we can provide these surveys.

If the boundary of the Area of Search changes, or additional works are planned, contact Zetica for a re-assessment of the UXO risk and the risk mitigation requirements.

APPENDICES

Appendix 1 Summary Tables

Table 1 Aircraft crashes in and within close proximity to the Area of Search

Grid Reference	Location	Type	Serial No.	Date
TM 261940	Road Green Farm, Hempnall	Mosquito BIV	DZ587	11-1943
TM 226929	Old Hall Farm, Fritton	B-24 Liberator	41-29116	01-1944
TM 243945	Hempnall	B-24 Liberator	41-24192	02-1944
TM 175879	Tivetshall	Lightning P-38J	42-67895	03-1944
TM 201922	St Michael's Church, Long Stratton	B-24 Liberator	41-29463	01-04-1944
TM 217928	North Morningthorpe	B-24 Liberator	N/A	08-05-1944
TM 237907	Shelton Green	B-24 Liberator	42-50597	12-1944
TM 235968	Saxlingham	B-24 Liberator	44-10577	04-1945
TM 324955	Fields off Airfield Lane	Flying Fortress	N/A	17-04-1945
Post WWII				
TM 242964	Saxlingham Green	Mosquito NF36M	RK995	01-1948

Table 2 Anti-invasion defences in and within close proximity to the Area of Search

Grid Reference	Type	Location
TM 190874	Pillbox	Rookery Farm

Table 3 Home Guard battalions in and within close proximity to the Area of Search

Battalion	Location
3rd Norfolk Battalion Home Guard	Norwich

Table 4 WWII AA searchlights in and within close proximity to the Area of Search

Grid Reference	Location
TM 219918	Morningthorpe

Table 5 Bombing statistics

Area	Bombs Recorded				
	High Explosive	Parachute Mines	Other	Total	Bombs per 405ha (1000 acres)
Forehoe & Henstead RD	425	24	2	451	6.4
Lodden RD	262	7	1	270	4.5
Depwade RD	309	0	5	314	3.9

Appendix 2 Glossary and definitions

Abandoned Explosive Ordnance (AXO)	Explosive ordnance that has not been used during an armed conflict, that has been left behind or disposed of by a party to an armed conflict, and which is no longer under control of that party. Abandoned explosive ordnance may or may not have been primed, fuzed, armed or otherwise prepared for use.
Demil	Derived from the term 'Demilitarisation', demil refers to the break down and the recycling or disposal of ordnance components.
Detonation	The high-speed chemical breakdown of an energetic material producing heat, pressure, flame, and a shock wave.
Device	Any component, sub-assembly or completed ordnance, which may or may not have an explosive risk. It can apply to detonators, primers, gaines, fuzes, shells, or bombs.
Explosive	Compounds forming energetic materials that under certain conditions chemically react, rapidly producing gas, heat, and pressure. These are extremely dangerous and should only be handled by qualified professionals.
Explosive Ordnance (EO)	All munitions containing explosives, nuclear fission or fusion materials, and biological and chemical agents. This includes bombs and warheads, missiles, artillery, mortar, rocket, Small Arms Ammunition, mines, torpedoes, depth charges, pyrotechnics, cluster bombs and dispensers, cartridge and propellant devices, electro-explosive devices, clandestine and improvised explosive devices, and all related items/components which are explosive in nature.
Explosive Ordnance Clearance (EOC)	The operation of ordnance detection, investigation, identification, and removal, with Explosive Ordnance Disposal being a separate operation.
Explosive Ordnance Disposal (EOD)	The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of Unexploded Ordnance.
Explosive Ordnance Reconnaissance (EOR)	The detection, identification, and on-site evaluation of Unexploded Ordnance before Explosive Ordnance Disposal.
Explosive Remnants of War (ERW)	Unexploded Ordnance and Abandoned Explosive Ordnance, excluding landmines.
Explosive Substances & Articles (ESA)	Explosive substances are solid or liquid substances (or a mixture) which are either: capable by a chemical reaction of producing gas at a speed, temperature, and pressure to cause damage to the surroundings; or designed to produce an effect by heat, light, sound, gas, or smoke (or a combination) as a result of a non-detonative, self-sustaining, exothermic reaction. One or more explosive substances form an explosive article.

Fuze	The part of an explosive device that initiates the main explosive charge to function. In common usage, the word fuze is used indiscriminately, but when being specific (and especially in a military context), fuze is used to mean a more complicated device, such as a device within military ordnance.
Gaine	Small explosive charge that is sometimes placed between the detonator and the main charge to ensure ignition.
Geophysical survey	A range of methods that can be used to detect objects or identify ground conditions without the need for intrusive methods (such as excavation or drilling). This is particularly suited to ordnance, as disturbance of ordnance is to be avoided where possible.
High Explosive (HE)	Secondary explosives (commonly known as HE) make up the main charge or filling of an ordnance device. They are usually less sensitive than primary explosives. Examples of secondary explosives are Nitro-glycerine (NG), Trinitrotoluene (TNT), Amatol (Ammonium nitrate and TNT), gunpowder, and Cyclotrimethylenetrinitramine (RDX).
Land Service Ammunition (LSA)	Items of ordnance thrown, propelled, or placed during land warfare, to include grenades, mortar bombs, projectiles, rockets, and landmines.
Munition	The complete device charged with explosives, propellants, pyrotechnics, initiating composition, or nuclear, biological, or chemical material for use in military operations, including demolitions. This includes those munitions that have been modified for use in training, ceremonial, or non-operational purposes. These fall into three distinct categories: inert (contain no explosives), live (contain explosives and have not been fired), and blind (have fired but failed to function as intended.)
Primary Explosive	Explosives used to initiate less sensitive explosives and usually extremely sensitive to friction, heat, and pressure. Primary explosives are commonly found in detonators. Examples of primary explosives are lead azide, lead styphnate, and mercury fulminate.
Propellants	Provide ordnance with the ability to travel in a controlled manner and deliver the ordnance to a predetermined target. Propellants burn rapidly producing gas, pressure, and flame. Although usually in solid form they can be produced in liquid form. Examples of propellants are ballistite, often in flake form, and cordite, often in string form.
Pyrotechnic	An explosive article or substance designed to produce an effect by heat, light, sound, gas, or smoke (or a combination), as a result of non-detonative, self-sustaining, exothermic chemical reactions.
Small Arms Ammunition (SAA)	Projectiles around 12mm or less in calibre and no longer than approximately 100mm. They are fired from a variety of weapons, including rifles, pistols, shotguns, and machine guns.

Unexploded Anti-Aircraft (UXAA) Shell	Ordnance containing High Explosives, although they can also contain pyrotechnic compounds that produce smoke. They ranged from 2" to 5.25" calibre, although most common were 3.7" and 4.5" HE shells.
Unexploded Bomb (UXB)	A common term for unexploded air-dropped munitions.
Unexploded Ordnance (UXO)	Explosive ordnance that has been primed, fuzed, armed, or prepared for use and subsequently fired, dropped, launched, projected, or placed in such a manner as to present a hazard to operations, persons, or objects, and remains unexploded either by malfunction or design.
V1	The Vergeltungswaffe-1, also designated Fieseler Fi 103/FZG-76, known colloquially in English as the Flying Bomb, Pilotless Aircraft, Buzz Bomb, or Doodlebug, was the first guided missile used in WWII and the forerunner of today's cruise missile.
V2	The Vergeltungswaffe 2 ('Reprisal Weapon 2') was the first ballistic missile. It was used primarily against Belgian and British targets during the later stages of WWII. It was also the first man-made object launched into space, during test flights in 1944.

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3) This drawing only shows features in, and within close proximity of, the Area of Search

4) Where a low hazard constraint has been identified, a detailed UXO Desk Study and Risk Assessment is considered prudent but not essential

5) Where moderate and high hazard constraints have been identified, a Detailed Desk Study and Risk Assessment is recommended

Legend

Area of Search

High

Moderate

Low

Military airfield

Bombing

Bombing decoy

Aircraft crash (X)

Anti-Aircraft defence (AA)

Anti-invasion defence (AI)

Bombing decoy (D)

0 1 2 km

Drawing Details

Client: Stantec

Location: Long Stratton to East Pye

Project: Zetica Unexploded Ordnance (UXO) Desk Study and Constraints Assessment

Drafted by: Maisy Venn

Checked by: Stefan Lang

Survey Date: 04/11/2024 **Issue Date:** 04/11/2024

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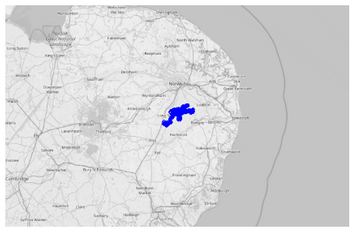

Unexploded Ordnance Constraints Map

Project No.	Drawing No.	Report No.	Revision	Sheet
P14931-24	MAP01	R1	A	1

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