Springwell Solar Farm

Environmental Statement
Appendix 11.2: Springwell Preliminary Risk Assessment
Part 4

Volume 3

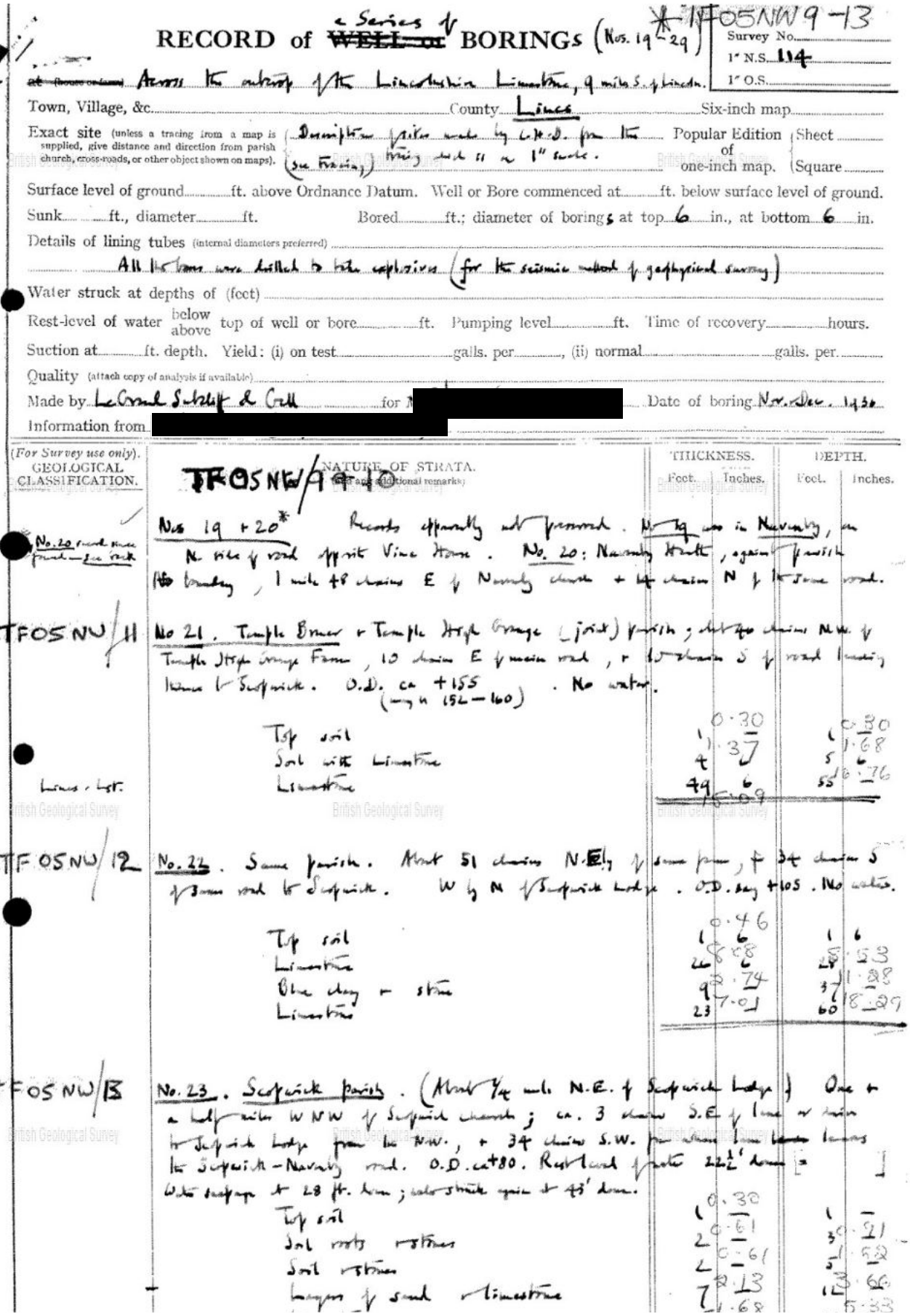
APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

EN010149/APP/6.3
November 2024
Springwell Energyfarm Ltd

APPENDIX E6 BGS BOREHOLE LOGS – ZONE H



RECORD of a Series of ~~WELL or~~ BORINGS (Nos. 19–29) *TF05NW9-13

Survey No.
1" N.S. 114
1" O.S.

at (house or farm) Across the outcrop of the Lincolnshire Limestone, 9 miles S. of Lincoln.

Town, Village, &c. County Lincs Six-inch map

Exact site (unless a tracing from a map is supplied, give distance and direction from parish church, cross-roads, or other object shown on maps). Description given made by L.H.C. from the (see Tracing) Tracing sent on 1" scale. Popular Edition of one-inch map. Sheet Square

Surface level of ground ft. above Ordnance Datum. Well or Bore commenced at ft. below surface level of ground.

Sunk ft., diameter ft. Bored ft.; diameter of boring at top 6 in., at bottom 6 in.

Details of lining tubes (internal diameters preferred)

All the holes were bottled to take explosives (for the seismic method of geophysical survey)

Water struck at depths of (feet)

Rest-level of water below / above top of well or bore ft. Pumping level ft. Time of recovery hours.

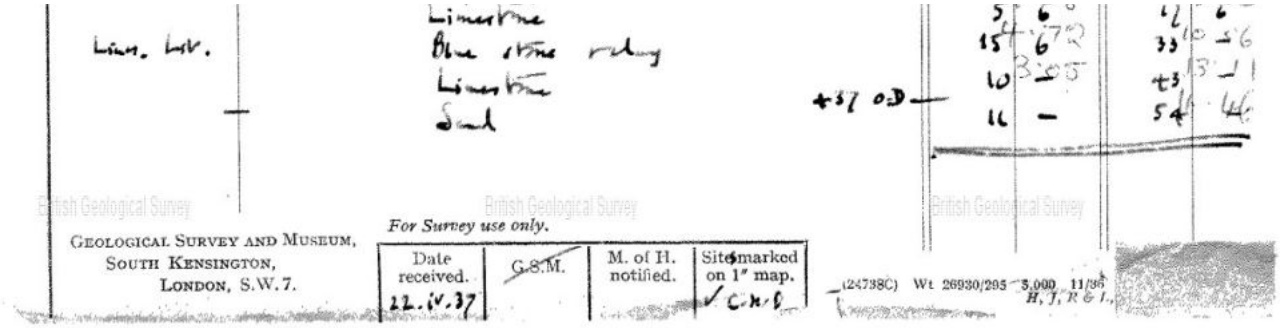
Suction at ft. depth. Yield: (i) on test galls. per, (ii) normal galls. per.

Quality (attach copy of analysis if available)

Made by L. Cornish Sutcliff & Gell for [redacted] Date of boring Nov.-Dec. 1930

Information from [redacted]

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA. (Thickness and additional remarks)	THICKNESS. Feet.	Inches.	DEPTH. Feet.	Inches.
	TF05NW/9 & 10				
	Nos 19 + 20* Records apparently not preserved. No 19 was in Navenby, on N side of road opposite Vine Farm. No. 20: Navenby Heath, against parish boundary, 1 mile 48 chains E of Navenby church + 44 chains N of Farm road.				
TF05NW/11	No 21. Temple Bruer + Temple Heath Grange (joint) parish; about 40 chains N.W. of Temple Heath Grange Farm, 10 chains E of main road, + 10 chains S of road leading from Scopwick to Scopwick. O.D. ca +155 (varies 152–160). No water.				
	Top soil	0	30	0	30
	Soil with limestone	1	37	1	68
	Limestone	4	5	5	6
Lincs. List.		49	6	55	76
		54	6		
TF05NW/12	No. 22. Same parish. About 51 chains N.E.ly of same farm, + 34 chains S of same road to Scopwick. W by N of Scopwick Lodge. O.D. say +105. No water.				
	Top soil	0	46	0	46
	Limestone	1	6	1	6
	Blue clay + stone	6	68	8	53
	Limestone	6	6	28	59
		9	74	34	88
		7	01	41	89
		23		60	
TF05NW/13	No. 23. Scopwick parish. (About ¼ mile N.E. of Scopwick Lodge.) One + a half miles W.N.W. of Scopwick church; ca. 3 chains S.E. of line of drain to Scopwick Lodge from the N.W., + 34 chains S.W. from same line between lanes to Scopwick–Navenby road. O.D. ca +80. Rest-level of water 22½' down. Water struck at 28 ft. down; water-struck again at 45' down.				
	Top soil	0	30	0	30
	Soil roots + stones	2	61	3	91
	Soil + stones	2	61	5	52
	Layers of sand + limestone	7	13	12	66
		7	68	19	34


Lim. Wr.
Limestone
Blue stone rubbly
Limestone
Sand
+37 0.D
15 6 72
10 3 05
11 —
33 10 16
+3 13 11
54 46
British Geological Survey
British Geological Survey
British Geological Survey
GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.
For Survey use only.
Date received. 22.iv.37
G.S.M.
M. of H. notified.
Site marked on 1" map.
(24738C) Wt 26930/295 5,000 11/36
H, J, R & L.

CLR 9/10/90

RECORD OF WELL (SHAFT OR BORE)

036 45626

TF 05 NE 4

1" N.S. [illegible]

At [illegible] Hill Farm

Town or Village [illegible] Six-inch quarter sheet [illegible]

Exact site (Reach Twp ... See tracing in parish of Rowston (a rough sketch-map or a tracing from a map is very desirable)

Level of ground surface above sea-level (O.D.) 217 ft. If well starts below ground surface, state how far ____ ft.

Shaft ____ ft., diameter ____ ft. Bore ____ ft. Diameter of bore: at top ____ ins.; at bottom ____ ins.

Details of permanent lining tubes (internal diameters preferred) ____

Water struck at depths of (feet) ____

Rest-level of water ~~below~~ above top of well 44 feet. Suction at ____ feet. Yield on ____ hours' days' test ____ gallons per ____ (with pump of capacity ____ g.p.h.); depressing water level to ____ feet below top. Time of recovery ____ hrs. Amount normally pumped daily ____ g.p.h. for ____ hours.

Quality (attach copy of analysis if available) ____

Sunk by [redacted] e of well Jul 1926

Informati [redacted]

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA (and any additional remarks).		THICKNESS Feet.	THICKNESS Inches.	DEPTH Feet.	DEPTH Inches.
Soil, [illegible] Clay	(map location). Red soil	0.46	1	6	1	6
	Yellow sandstone	1.37	4	6	6	—
	Blue clay	0.30	1	—	7	—
Great Oolite Limestone	Blue stone	1.22	4	—	11	—
	Blue clay	DWL 0.15				
	Blue stone	2.74	9			
	Yellow sandstone	0.46	1	6		
	Blue clay	0.30	1		25	—
Upper Estuarine Beds	Very hard blue stone	RLD 1.52	5		28	—
	Black clay	0.161				
	Blue stone	1.83	6			
	Blue clay	0.30	1			
	Very hard blue stone	11.89	39		74	—
L.F.	Brown sandstone	LL 1.22	4		80	—
	Hard blue stone	9.75	32	—	112	—

Comments

? DWL DGL RLD RD

6.71 Rock CLAY SST ZDG

11.28 CLAY STONE RLD

34.14 STONE LL

Taken by [illegible] sampled and cut off 5 inches down.

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

For Survey use only

Date received	G.S.M. Offices File No.	Site marked on 1" map (see symbol)
VIII – 5K		

(*11818) Wt.29061/O.889 10,000 A.& E.W.Ltd. Gp.536

British Geological Survey

Version 2.0.6.6

BGS ID: 469074 : BGS Reference: TF05NW7/A
British National Grid (27700) : 504886,356649
[redacted]

WELL BORING at Digby Aerodrome, 17V County Lincs

Geol. map OS 70(NE) 1 in. map New Series 114 6 in. map 87S.W.

Made by R.C. boring squad Date 1935.

Bored

Communicated by [redacted]

Height above Ordnance Datum 0ft. 0102 3104 Rest level of water

Yield sufficient quantity

Quality (with copy of analysis on separate sheet)

TF05NW7

114

No 2 Bore - 04895665

54A

GEOLOGICAL FORMATION.	NATURE OF STRATA.	THICKNESS. Feet.	Inches.	TH. Feet.	Inches.
	Pennell gravel	0.61	2 —	0.61	2 —
	Hard siliceous limestone Lincs. Lst.	10.52	34 6	11.13	36 6
	" " " W. Sandstone Sands.	2.66	8 —	13.56	44 6
	Very hard bluestone	8.38	24 6	21.95	72 —
	Bluestone with yellow sandstone	0.61	2 —	22.56	74 —
	Greyish blue conglomerate) Probable Lst.	5.49	18 —	28.06	92
	Hard siliceous limestone	1.22	4 —	29.28	96
	Hard bluestone	1.37	4 6	30.65	100 6
	Blue Sandy shale Lower Estuarine	0.91	3 —	31.56	103 6
	Soft yellow sandstone [? sand] Northampton Sands	0.61	2 —	32.16	105 6
	Dark blue shale Upper Lias	3.88	16 —	37.03	121 6

A.B. Bored on Lincs 87SW-E.

Site visited by [illegible] (1.i.'47)

[Digby aerodrome is apparently the same place as Scopwick Camp 114/93 R.L.S. 14/4/42]

[Trouble was followed by a loss of part of the "sufficient quantity" for boring only]

[Remedy would be to drill middle sandy & marl R.L.S. 14/4/42]

Bored on Lincs 87SW-E

No 2 Bore. RWL. 53'05. 22.10.49. [LWB Return]

Yield. 2,120 gph.

OD.C102.

GSM 6469 § Digby

Subsurface 4.xi.25 by J.A.H.

GEOLOGICAL SURVEY AND MUSEUM,

[redacted]RMYN STREET, LONDON, S.W. 1.

(S. 1456.) Wt. 36[illegible]/269. 2000. 6-19. Ph. & Ty. Ltd.

RECORD OF WELL (SHAFT OR BORE)

"TF05/18A 114. / 54A

At Scopwick Camp (R.A.F.) No1 Bore.

Town or Village

County Lincs. Six-inch quarter sheet 87 SW/E

For Mr.

Exact site of well TF05NW 0488 5668 (Attach a tracing from a map, or a sketch-map, if possible.)

Level of ground surface above sea-level (O.D.) C99 feet.

Is well-top at ground level? If not, state how far above / below; feet.

Shaft ft., diameter ft. Details of headings

Bore 91 ft.; diameter of bore: at top 11 ins.; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes

Water struck at depths, below well-top, of (feet) 46 ft.

TEST DETAILS

Month May
Year 1918

Rest-level of water 38 ft. above / below well-top. Suction at ft. Yield on hours' / days'
pumping. gallons per (max. capacity of pump g.p.h.),
with depression of feet. Recovery to in mins. / hours.

WORKING CONDITIONS

Rest-level of water in (month), (year), ft. above / below well-top.
Highest " in (month), (year), ft. above / below "
Lowest " in (month), (year), ft. above / below "
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins. / hours

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

Well made by J.T. BARNES & son, Date of well Apr - May 1918

Information from SLEAFORD-do

ADDITIONAL NOTES.

"Supply not known, but a lot of water"

Aerodrome marked on 1" pop 47.

(a) No1 Bore. RWL 38' 6.5
yield 2.480 gph.
OD. C99 Rm 1969

LOG OF STRATA OVERLEAF.

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

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked on 1" Map.	(use symbol) on 6" Map.
		11 G		△	⊙

(17208) Wt.42201/0377 10,000 2/41 A.& E.W.Ltd. Gp.686

British Geological Survey

Version 2.0.6.6

BGS ID: 469074 : BGS Reference: TF05NW7/A
British National Grid (27700) : 504886,356649

[redacted]

(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	
91	-	91	-	SL4A

TF 05 18/4/5

Limes.ht. Limestone

RJB
16/12/75

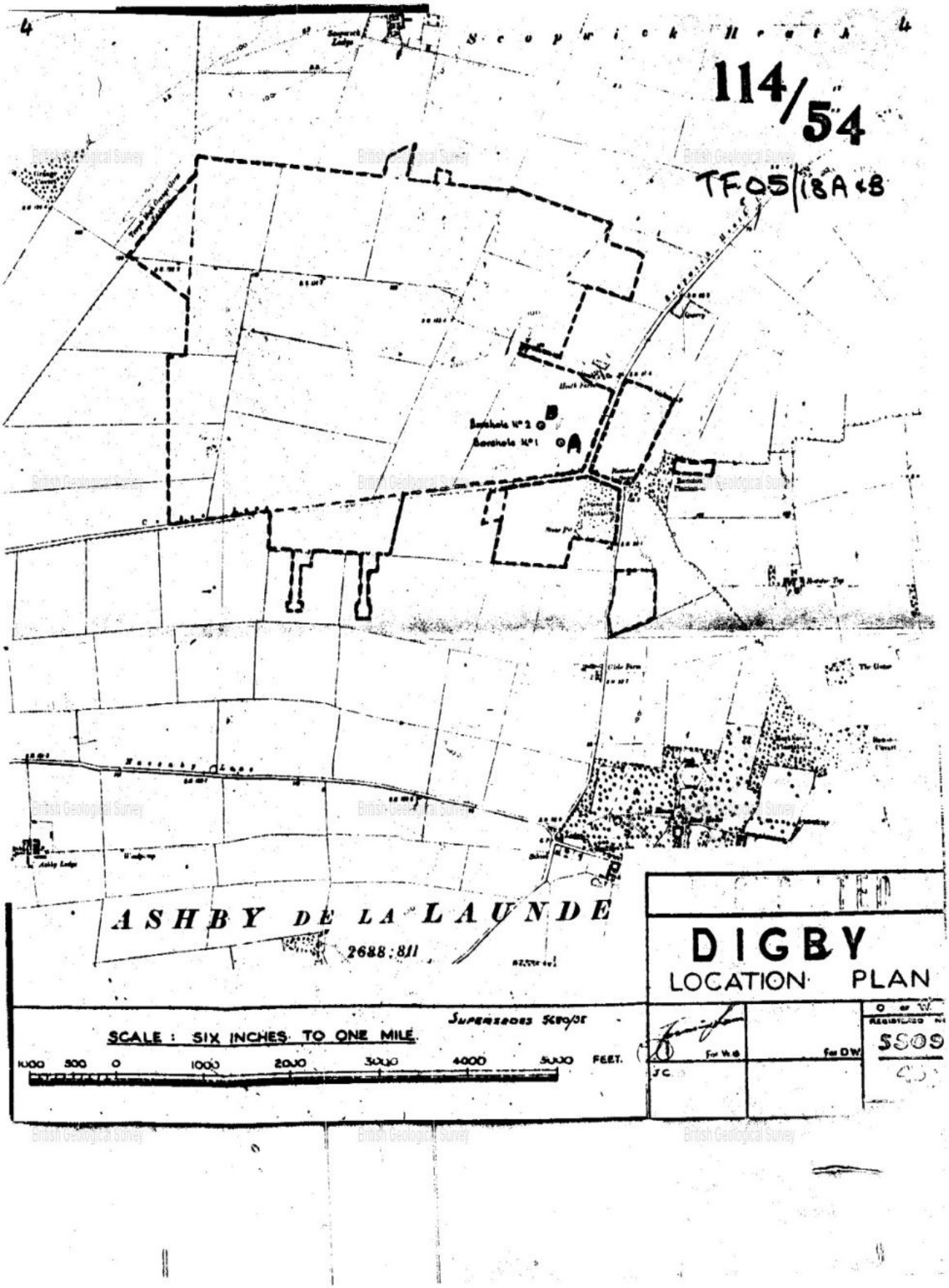

British Geological Survey
British Geological Survey

British Geological Survey

Version 2.0.6.6

BGS ID: 469074 : BGS Reference: TF05NW7/A
British National Grid (27700) : 504886,356649

[redacted]

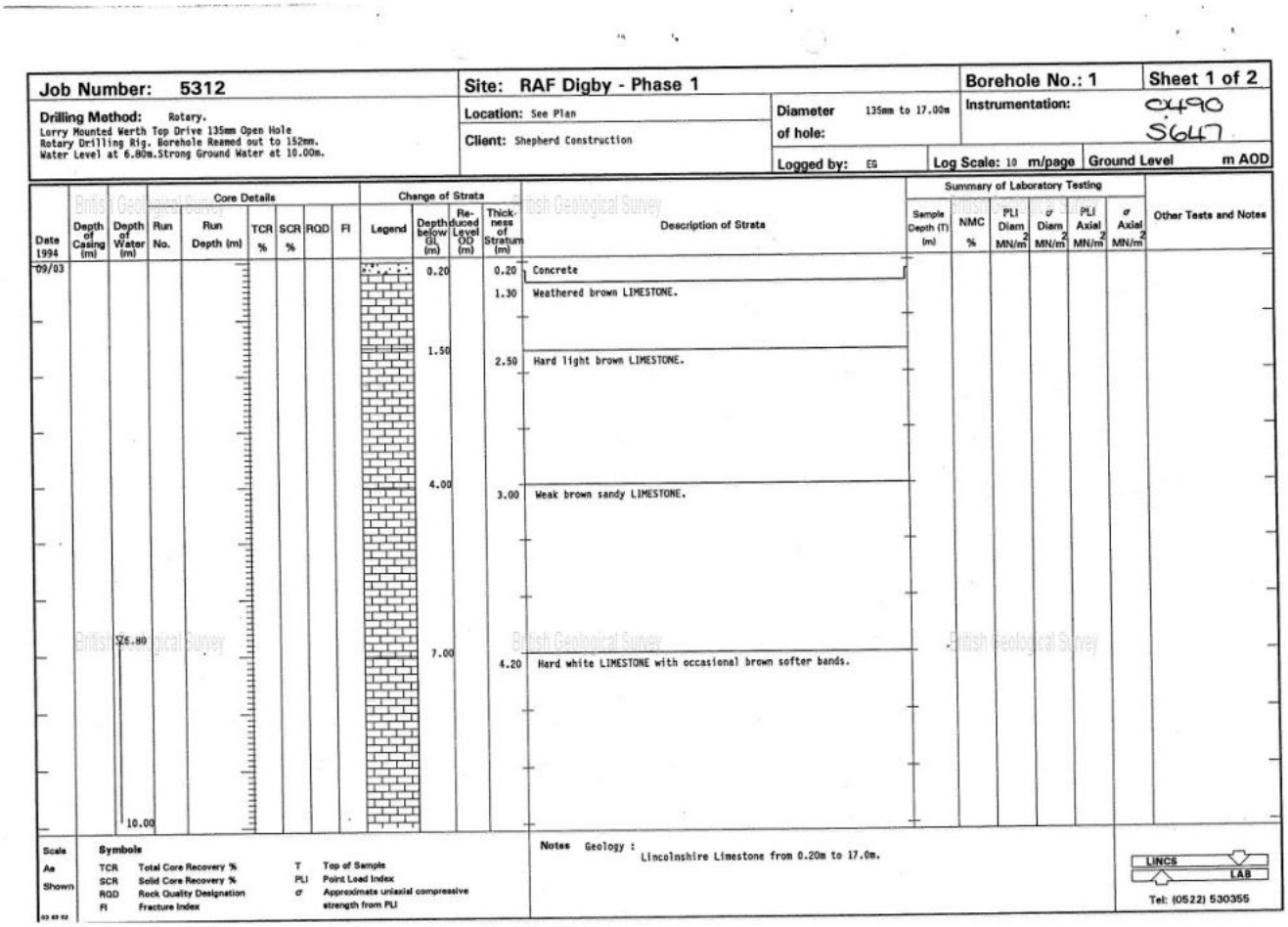


British Geological Survey

Version 2.0.6.6

BGS ID: 15611372 : BGS Reference: TF05NW44
British National Grid (27700) : 504900,356470

[redacted]



Job Number: 5312 | **Site:** RAF Digby - Phase 1 | **Borehole No.:** 1 | **Sheet 1 of 2**

Drilling Method: Rotary.
Lorry Mounted Werth Top Drive 135mm Open Hole Rotary Drilling Rig. Borehole Reamed out to 152mm. Water Level at 6.80m.Strong Ground Water at 10.00m.

Location: See Plan | **Client:** Shepherd Construction | **Diameter of hole:** 135mm to 17.00m | **Instrumentation:** CX490 S647 | **Logged by:** EG | **Log Scale:** 10 m/page | **Ground Level** m AOD

Date 1994	Depth of Casing (m)	Depth of Water (m)	Core Details: Run No.	Run Depth (m)	TCR %	SCR %	RQD %	FI	Change of Strata: Legend	Depth below GL (m)	Re-duced Level OD (m)	Thick-ness of Stratum (m)	Description of Strata	Summary of Laboratory Testing: Sample Depth (T) (m)	NMC %	PLI Diam MN/m²	σ Diam MN/m²	PLI Axial MN/m²	σ Axial MN/m²	Other Tests and Notes
09/03										0.20		0.20	Concrete							
										1.50		1.30	Weathered brown LIMESTONE.							
										4.00		2.50	Hard light brown LIMESTONE.							
		▽6.80								7.00		3.00	Weak brown sandy LIMESTONE.							
		10.00										4.20	Hard white LIMESTONE with occasional brown softer bands.							

Scale As Shown

Symbols
TCR Total Core Recovery %
SCR Solid Core Recovery %
RQD Rock Quality Designation
FI Fracture Index
T Top of Sample
PLI Point Load Index
σ Approximate unaxial compressive strength from PLI

Notes Geology : Lincolnshire Limestone from 0.20m to 17.0m.

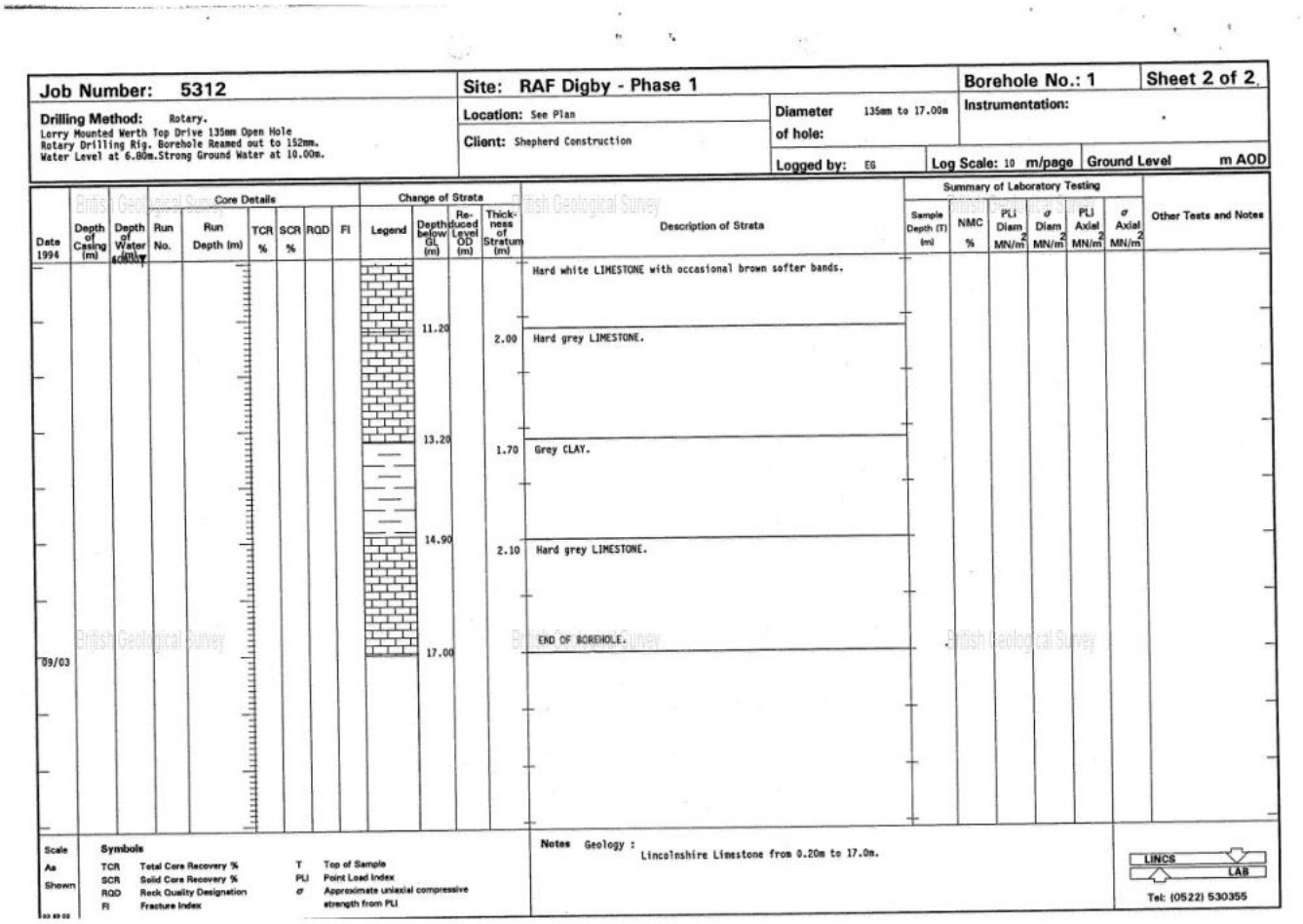
LINCS LAB
Tel: (0522) 530355

British Geological Survey

Version 2.0.6.6

BGS ID: 15611372 : BGS Reference: TF05NW44
British National Grid (27700) : 504900,356470

[redacted]



Job Number: 5312 | **Site:** RAF Digby - Phase 1 | **Borehole No.:** 1 | **Sheet 2 of 2**

Drilling Method: Rotary.
Lorry Mounted Werth Top Drive 135mm Open Hole Rotary Drilling Rig. Borehole Reamed out to 152mm. Water Level at 6.80m.Strong Ground Water at 10.00m.

Location: See Plan | **Client:** Shepherd Construction | **Diameter of hole:** 135mm to 17.00m | **Instrumentation:** | **Logged by:** EG | **Log Scale:** 10 m/page | **Ground Level** m AOD

Date 1994	Depth of Casing (m)	Depth of Water (m)	Core Details: Run No.	Run Depth (m)	TCR %	SCR %	RQD	FI	Change of Strata: Legend	Depth below GL (m)	Re-duced Level OD (m)	Thick-ness of Stratum (m)	Description of Strata	Summary of Laboratory Testing: Sample Depth (T) (m)	NMC %	PLI Diam MN/m²	σ Diam MN/m²	PLI Axial MN/m²	σ Axial MN/m²	Other Tests and Notes
										11.20		2.00	Hard white LIMESTONE with occasional brown softer bands.							
										13.20		1.70	Hard grey LIMESTONE.							
										14.90		2.10	Grey CLAY.							
09/03										17.00			Hard grey LIMESTONE. END OF BOREHOLE.							

Scale As Shown

Symbols
TCR Total Core Recovery %
SCR Solid Core Recovery %
RQD Rock Quality Designation
FI Fracture Index
T Top of Sample
PLI Point Load Index
σ Approximate uniaxial compressive strength from PLI

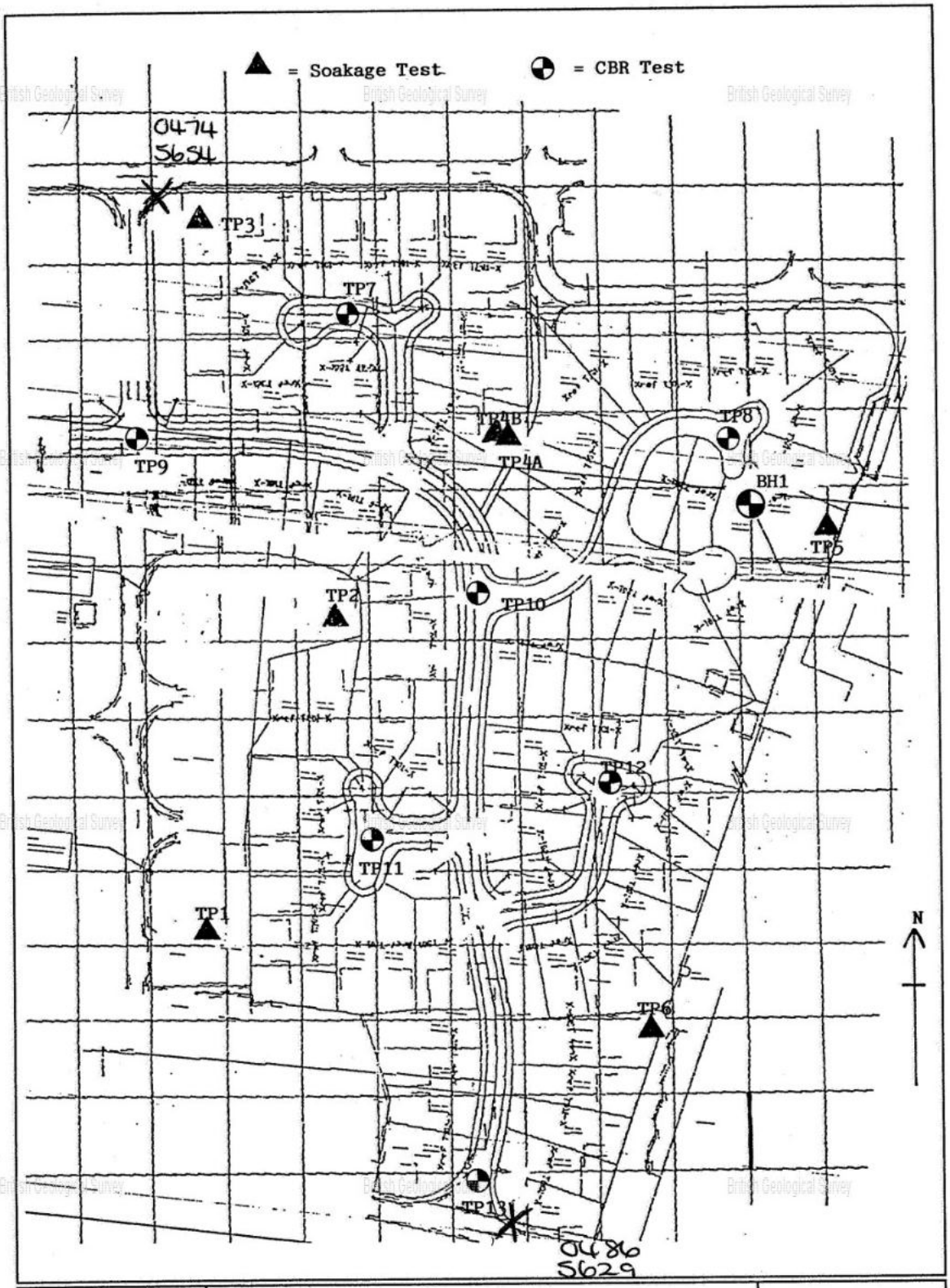
Notes Geology : Lincolnshire Limestone from 0.20m to 17.0m.

LINCS LAB
Tel: (0522) 530355

British Geological Survey

Version 2.0.6.6

BGS ID: 15611372 : BGS Reference: TF05NW44
British National Grid (27700) : 504900,356470
[redacted]



March 1994 Dwg No 2	R.A.F. Digby - Phase 1 Trial Pit/Borehole Location Plan	LINCS LAB Telephone (0522) 530355

APPENDIX E7 BGS BOREHOLE LOGS – ZONE I

RECORD OF WELL (SHAFT OR BORE)

06225799

TF05NE/2

SCOPWICK.

Pilot borehole sunk by Messrs. Hamblett & Son for Messrs. British Crop Driers Ltd. at Scopwick, July 1943.

Ground level 60.83 O.D.

Soil etc.	Soil & stones	0.46	1-6			
	Sand & gravel	1.07	3-6	1.52	5-0	
	Soft limestone	3.96	13-0	3.99	18-0	
	Hard limestone	3.81	12-6	3.80	30-6	
	Very hard "	0.91	3-0	10.21	33-6	
	Black clay	0.91	3-0	1.13	36-6	
	Limestone	0.61	2-0	1.73	38-6	
	Grey clay	0.61	2-0	12.34	40-6	
	Limestone grey	15.24	50-0	27.58	90-6	
	" yellow					
	"light grey					
Northampton Sands and Lower Estuarine Beds	Blue sandstone fairly hard	2.74	9-0	36.33	99-6	
? Upper Lias	Limestone	0.91	3-0	3.24	102-6	
	Black clay	3.05	10-0	34.71	112-6	

Lined with 6" tubes. SAGK RH

Most water found in this layer. LL

GRF (rel 3)

Water rest level in bore 8 feet below ground level 25.7.43.(Sunday)
Centrifugal pump test gave 5,000 galls per hour measured over V-notch.
Impossible to measure loss of head owing to suction pipe filling bore tube.
Level of subsoil water between bore tube and working tube 12 feet below ground level.

map, or a sketch map if possible. Plotted on Lines 8 NW-SE

above / below well-top.

above / below "

above / below "

hours per day.

mins. hours

[redacted]

This bore supplies most of the water used at the British Crop Driers' Factory (see 114/123)

Inf. per No 3 Regional Engineer (Mr J Mackay) per D. Mason 25. VI. 48
14 - 12" Cons. Barnsha submersible Pump. 36 K. V. A. motor.
8000 g.p.h. but throttled back to 7000 g.p.h.
Runs 8 hours/day. Summer 4½ hours/day. Not worked continuously but makes up storage in 12,000 gallon tank
J.J. 27. VI. 48

LOG OF STRATA OVERLEAF.

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

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map.	on 6" Map.
				⊙	⊙

(17208) Wt.42901/0877 10,000 2/41 A.& E.W.Ltd. Gp.686

BGS ID: 469005 : BGS Reference: TF05NE3
British National Grid (27700) : 506381,357874

[redacted]

TF05NE3

A description of the strata pierced should be given as follows :—

Other information from W.B. Marsden's 1924 printed return :—
Surface level : max. 64·5′, min. 51·5′ (O.D.)
Pumping level : max 58′, min 48′ (O.D.)
Pumps : 5"×6" double ram, 3000 g.p.h. by capacity, working average 3 hrs. per day.
Remarks [Water Tower site 1 mile N. of town] 31,000 g, 10 ft draft, top water level 135·5 ft O.D.
Yield, never fully tested, more than 150,000 gals per day, maximum capacity 7,500 g. in 540 minutes. [each minute]

	Thickness of each stratum.		Total depth of the strata.	
	Feet.	Inches.	Feet.	
Vegetable Soil.	4	1·22	4	1·22
Running Quick Sands (§)	12	3·66	16	4·88
White Limestone	24	7·32	40	12·19
Blue Limestone	40	12·19	80	24·38
Hard Blue Limestone	36	10·97	116	35·36
Blue clay [? W. Walton W.B. boring]	4	1·22	120	36·58

Lincs. List 100′ OD −61

~~If Soil Sect attached~~

The Static level of water in Borehole was taken under favourable conditions. The variation in the Static level of water in the boreholes belonging to the Council in the North District averages 9'6". The variation in the South district is much greater having been found at Osbournby on one occasion to be 28' 10". The Quick sands shewn in Section have been cut off from borehole by means of a 4'0" diameter* C.I 1/8" thick cylinder, and there is no pollution whatever to the borehole

(*W.B.M says 5′ diameter in written record)

[redacted]

Feby 25th 1911

The following should also be forwarded to the Board :—

(1.) Map 6 in. to 1 mile. On this map the position of the well or boring should be shewn in red color.

(2.) Section to scale showing the size of the well or boring, strata pierced, rest level of water, and other particulars.

CLR 9/10/90

RECORD OF WELL (SHAFT OR BORE)

036 45626

TF 05 NE 4

1" N.S. [illegible]

At Roughton Hill Farm, Roughton

Town or Village [illegible] Six-inch quarter sheet TF 05 NE

Exact site (Roads Tfk ... in 1/3 ... 1560 yds N 45 E of Hall ... Lamb church) See tracing in parish of Roughton (A rough sketch-map or a tracing from a map is very desirable)

Level of ground surface above sea-level (O.D.) 247 ft. If well starts below ground surface, state how far ft.

Shaft ft., diameter ft. Bore ft. Diameter of bore: at top ins.; at bottom ins.

Details of permanent lining tubes (internal diameters preferred)

Water struck at depths of (feet)

Rest-level of water ~~below~~ above top of well 44 feet. Suction at feet. Yield on hours' days' test gallons per (with pump of capacity g.p.h.); depressing water level to feet below top. Time of recovery hrs. Amount normally pumped daily g.p.h. for hours.

Quality (attach copy of analysis if available)

Sunk by [redacted] e of well July 1926

Informati [redacted]

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA (and any additional remarks).		THICKNESS Feet.	THICKNESS Inches.	DEPTH Feet.	DEPTH Inches.
Soil, [illegible] Clay	(map location). Red soil	0.46	1	6	1	6
	Yellow sandstone	1.37	4	6	6	—
	Blue clay	0.30	1	—	7	—
Great Oolite Limestone	Blue stone	1.22	4	—	11	—
	Blue clay	DWL 0.15				
	Blue stone	2.74	9			
	Yellow sandstone	0.46	1	6		
	Blue clay	0.30	1		25	—
Upper Estuarine Beds	Very hard blue stone	RLD 1.52	5		28	—
	Black clay	0.61	2		30	—
	Blue stone	1.83	6			
	Blue clay	0.30	1			
	Very hard blue stone	11.89	39		74	—
	Brown sandstone	LL 1.22	4		80	—
	Hard blue stone	9.75	32	—	112	—

Comments

?DWL DGL RLD RD

6.71 Rock CLAY SST DGL

11.28 CLAY STONE RLD

34.14 STONE LL

[illegible] sampled at 54 metres down.

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

For Survey use only

Date received	G.S.M. Office File No.	Site marked on 1" map (see symbol)
VIII – 5K		

(*11818) Wt.29061/O.889 10,000 A.& E.W.Ltd. Gp.536

Version 2.0.6.6

BGS ID: 469063 : BGS Reference: TF05NE54
British National Grid (27700) : 506370,357820
[redacted]

114 114/69. 51B 51A

To be furnished in Triplicate.

Transferred under SI: 1961: 2349 to Kesteven Water Board

WELLS AND BOREHOLES

Information to be supplied to the Ministry of Health

TF 05/13B

Name of District EAST KESTEVEN RURAL DISTRICT

If the District is a Rural District, name of Contributory Place concerned Scopwick, Digby, Rowston, etc..

Level of surface of ground above O.D. 55.58'

Depth and diameter of shaft or boring, or of each 15" bore to 42' 5" (lining for 42' down) 8" bore to 100'

Depth or depths at which water was found 4.58' O.D. (51' depth) and -32.42' O.D. (88' depth).

Yield of water in gallons per diem, as ascertained by continuous pumping during ----------- days or otherwise overflowed 210,000 gallons. (3750 g.p.h.)

Water rose to ground level & was allowed to run for two weeks, then gauged & found to be 210,000 galls per day. (An elec. motor driven pump is to be installed - capacity 3000 galls per hour.) See Report.

Level of water (above O.D.) at commencement of pumping ---

Level of water (above O.D.) at cessation of pumping ---

Time taken for water to return to original rest level after pumping ceased ---

A tabulated Statement should be sent showing the quantity of water pumped in each 24 hours during the duration of the test together with the level of the water (above O.D.) at the end of each day. If there should be any stoppage, the reason and duration should be stated. --- See note above

Distances of the well or borehole from any other known wells or boreholes in the neighbourhood 7 feet.

Quality. (Copies of chemical and bacteriological analyses should be annexed. Information as to the mineral constituents of the water is desirable) Copy. Attached.

A 6" to the mile Ordnance map showing (in red) the precise situation of the well or borehole Attached.

Scopwick Parish; 130 yds SW ... at W. of village ... 114/51 ...

Date of completion of well or borehole June 16th, 1937.

Well or borehole sunk by Messrs. Wm. Stone & Co., Eye, Suffolk.

Sig[redacted]

Date 12th July, 1937.

Normally the pumping test should be continuous over a period of 14 days.
This form should be signed by the Engineer for the proposed works.

P.T.O.

K.20 a

S.P.M. 44786·2·1956·AP

British Geological Survey

Version 2.0.6.6

BGS ID: 469007 : BGS Reference: TF05NE5
British National Grid (27700) : 506848,356681
[redacted]

RECORD OF WELL (SHAFT OR BORE)

TF 05 NE/5
114/94

At [illegible]

Town or Village [illegible] Newton

County [illegible] Six-inch quarter sheet 87 SW/E

For Mr. [illegible]

Exact site of well [illegible] { Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) 78 feet.

Is well-top at ground level? [illegible] If not, state how far above / below; [illegible] feet.

Shaft [illegible] ft., diameter [illegible] ft. Details of headings [illegible]

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

Lengths, diameters, perforations, etc., of lining tubes [illegible] [Le40]

Water struck at depths, below well-top, of (feet) [illegible]

TEST DI [illegible] Suction at [illegible] ft. Yield on [illegible] hours' / days'

Month. [illegible] g.p.h.),

Year [illegible] [illegible] ıs. [illegible] ırs.

[illegible] ft. above / below well-top.

[illegible] ft. above / below "

WORI / COND [illegible] ft. above / below "

[illegible] hours per day.

[illegible] mins. / hours

Quality of water [illegible]

Well made by J. T. BARNES & SON Date of well [illegible]

Information from SLEAFORD.

do

ADDITIONAL NOTES.

Visited. Sited on Lines 87SW-E.

[redacted]

Supplies farm. Plentiful supply.
Was tested to 400 gph when sunk.
O.D. C 78.

4-7.51 RM.

LOG OF STRATA OVERLEAF.

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

Date received.	G.S.M. Office 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.
		114		⊙	⊙

(17208) Wt.42901/0377 10,000 2/41 A.& E.W.Ltd. Gp.686

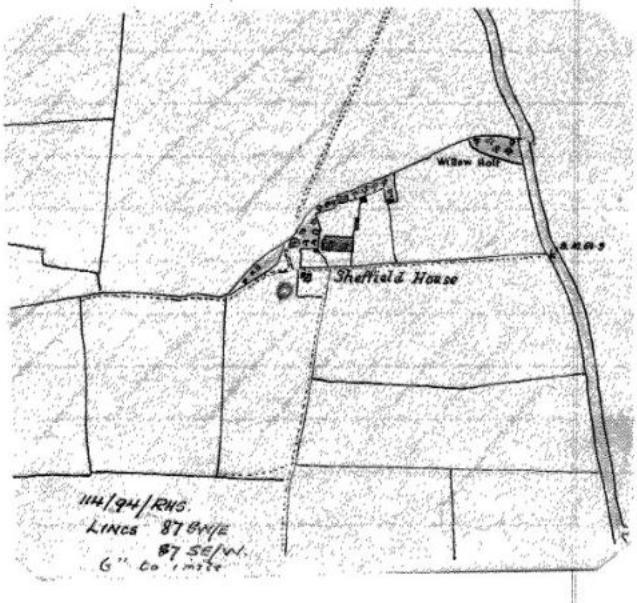
British Geological Survey

Version 2.0.6.6

BGS ID: 469007 : BGS Reference: TF05NE5
British National Grid (27700) : 506848,356681
[redacted]

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA 170 If measurements start below ground surface, state how far... ...	THICKNESS Feet ...	THICKNESS Inches ...	DEPTH Feet	DEPTH Inches
	Soil			3	—
	~~Blisworth Clay~~, Gt. Oolite Lst				
	and Upper Estuarine Beds	10	36	37	11.28
	Lincs Lst	18	29	97	29.56
		1	52	102	31.09

RJB



RECORD OF WELL (SHAFT OR BORE)

220

114/94

TF05/2

At Sheffield Arms

Town or Village ~~Scopwick~~ Newton

County Lincs. Six-inch quarter sheet 87 SW/E

For Mr.

Exact site of well TF05NE 0680 5669

Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) C 78. feet.

Is well-top at ground level? If not, state how far above / below; feet.

Shaft ft., diameter ft. Details of headings

Bore ft.; diameter of bore: at top ins.; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes 6" tubes to blue rock [1660]

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

TEST DETAILS
Month
Year

Rest-level of water ft. above / below well-top. Suction at ft. Yield on hours' / days'
pumping gallons per (max. capacity of pump g.p.h.),
with depression of feet. Recovery to in mins. / hours.

WORKING CONDITIONS

Rest-level of water in (month), (year), ft. above / below well-top.
Highest " in (month), (year), ft. above / below "
Lowest " in (month), (year), ft. above / below "
Suction at ft. Rate of pumping galls. per for hours per day.
with average depression of ft. Recovery to in mins. / hours

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

Well made by J. T. BARNES & son, Date of well Oct 1936

Information from SLEAFORD.

do

ADDITIONAL NOTES.

Plenty of water.
Visited. Listed as Lines 87SW-E.
Farmer: J. Bamber.
Supplies farm. Plentiful supply.
Was tested to 400 gph when sunk.
OD. C78.

47.51 RM.

Windpump on 1" popular 1963. & 6" grid sheet.

LOG OF STRATA OVERLEAF.

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

Date received.	G.S.M. Office File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (see symbol) on 1" Map.	on 6" Map.
		114.		⊙	⊙

(17296) Wt.42901/0877 10,000 2/41 A.& E.W.Ltd. Gp.656

British Geological Survey

Version 2.0.6.6

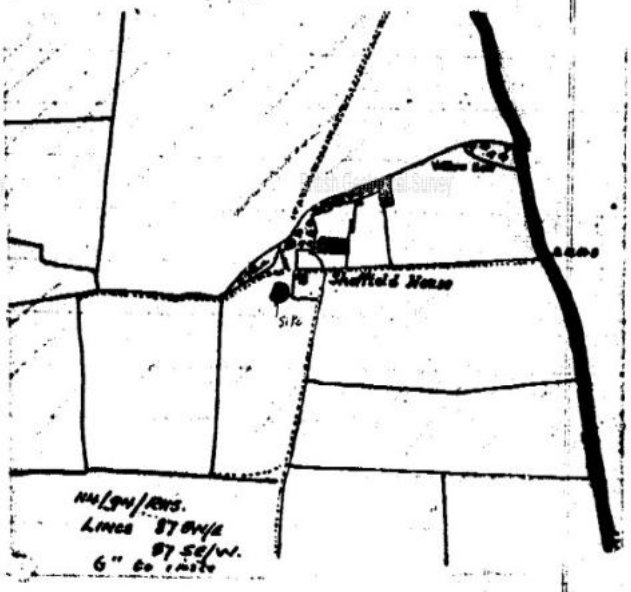
BGS ID: 469007 : BGS Reference: TF05NE5
British National Grid (27700) : 506848,356681
[redacted]

TF05/7

4/4/94

(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
Gt. Oolite Lst & U. Estuarine	Soil + gravel Soil	3		3	—
	Clay + stone Gt. Oolite Lst + Upper Estuarine Beds	34		37	—
Lincs Lst.	Blue rock } Lincs. Lst.	60		97	—
(WBE)	Limestone }	5		102	—

RJB.
16/12/75



WATER RESOURCES BOARD (Geology Division)

Reference Number G.S.M. 114/94 ..... TF05/2 .....

Chemical analysis of water sample (to be copied in the same units as original document)

Source of sample SHEFFIELD HOUSE

N.G.R. ..... Date Collected 15/11/68

Aquifer LINCOLNSHIRE LIMESTONE

Analyst F.A.LYNE Analyst's ref.no. 69

Appearance .....

E. cond. at 20°C ..... Turbidity (silica scale) .....

Reaction pH 7.7 Colour (hazen) .....

S.G. at ..... Odour .....

Temperature .....°C / .....°F Taste .....

Constituents (the units of the original analysis to be indicated, if not mg/l)

	Units:	mg/l		Units:	mg/l
T.D.S. (dried at 180°C)	.....	566	Nitrogen in nitrates	.....	.....
Hardness, Total*	.....	410	Nitrogen in nitrites	.....	.....
Carbonate*	.....	.....	Free ammonia	.....	.....
Non-carbonate*	.....	.....	Albuminoid ammonia	.....	.....
Alkalinity*	.....	240	Oxygen absorbed in		
Chlorine in chlorides	.....	55	4 hours at 27°C	.....	.....
Free carbon dioxide	.....	.....	Residual chlorine	.....	.....
Silica	.....	.....		.....	.....
Fluoride	.....	1.05		.....	.....
Metals	.....	.....		.....	.....

* expressed as calcium carbonate

		Units:	mg/l	me/l	Percentage reacting equivalents
Calcium	(Ca)	.....	.....	.....	.....
Magnesium	(Mg)	.....	.....	.....	.....
Sodium	(Na)	.....	.....	.....	.....
Potassium	(K)	.....	.....	.....	.....
		Total			
Carbonate	(CO_3)	.....	.....	.....	.....
Bicarbonate	(HCO_3)	.....	.....	.....	.....
Sulphate	(SO_4)	.....	116.	.....	.....
Chloride	(Cl)	.....	55.	.....	.....
Nitrate	(NO_3)	.....	.....	.....	.....
		Total			

Remarks: (continue overleaf if necessary)

DR 44378/1/89 2m 3/66 XL

BGS ID: 469024 : BGS Reference: TF05NE15
British National Grid (27700) : 507190,358530
[redacted]

RECORD of WELL or BORING (Nos. 19–29)

Survey No.
1" N.S. 114
1" O.S.

Across the outcrop of the Lincolnshire Limestone, 9 miles S. of Lincoln.

Town, Village, &c. County Lincs Six-inch map

Exact site (unless a tracing from a map is supplied, give distance and direction from parish church, cross-roads, or other object shown on maps). Description of site made by G.W.D. from the (see Tracing) tracing and is on a 1" scale. Popular Edition (Sheet of one-inch map. (Square

Surface level of ground ft. above Ordnance Datum. Well or Bore commenced at ft. below surface level of ground.

Sunk ft., diameter ft. Bored ft.; diameter of boring at top 6 in., at bottom 6 in.

Details of lining tubes (internal diameters preferred)
All the bores were bottled to take explosives (for the seismic method of geophysical survey)

Water struck at depths of (feet)

Rest-level of water below above top of well or bore ft. Pumping level ft. Time of recovery hours.

Suction at ft. depth. Yield: (i) on test galls. per, (ii) normal galls. per

Quality (attach copy of analysis if available)

Made by [redacted] Date of boring Nov.-Dec. 1930

Informat [redacted]

(For Survey use only).

TF05 NE/14 +15

	THICKNESS.	DEPTH.

Nos. 24 + 25 Records of 1" not received. No. 24 was 64 chains W.N.W of Scopwick church, & just N. of the Navenby Road. No. 25 was 26 chains N by E of Scopwick church and 26 chains E of the Blankney road at the turning to Navenby + Lincoln.

TF05 NE/16

No. 26. Scopwick parish; on the boundary, 78 chains E.N.E of Scopwick church and about 9 chains W.S.W of "Scopwick Lodge Fm." [another near Scopwick Lodge & bore 23]. O.D. [just below 50' contour] say 49'. No water met with

	Metres		Metres
Mould	0 5	6	60
Soil & stones	1 3	1	90·53
Limestone	5 1	6	92·06
Mottled clay	20 6	8	92·67
Clay	39 3	45	14·63
Hard sandy clay	123 6	60	18·29

"Bore is in Combrash over Upper Lias. ? Base of Oolite Lst"

TF05NE17 MARTIN PARISH BORE NO. 27 TF 09541 58809

TF05 NE/17

No. 27. Martin parish, on the Timberland boundary. 8 chains E of the railway at Scopwick Station and 37 chains N. by E of bridge (& level crossing ?) O.D. (just below 25' contour) say 24'. Rest-water-level 3 ft. down.

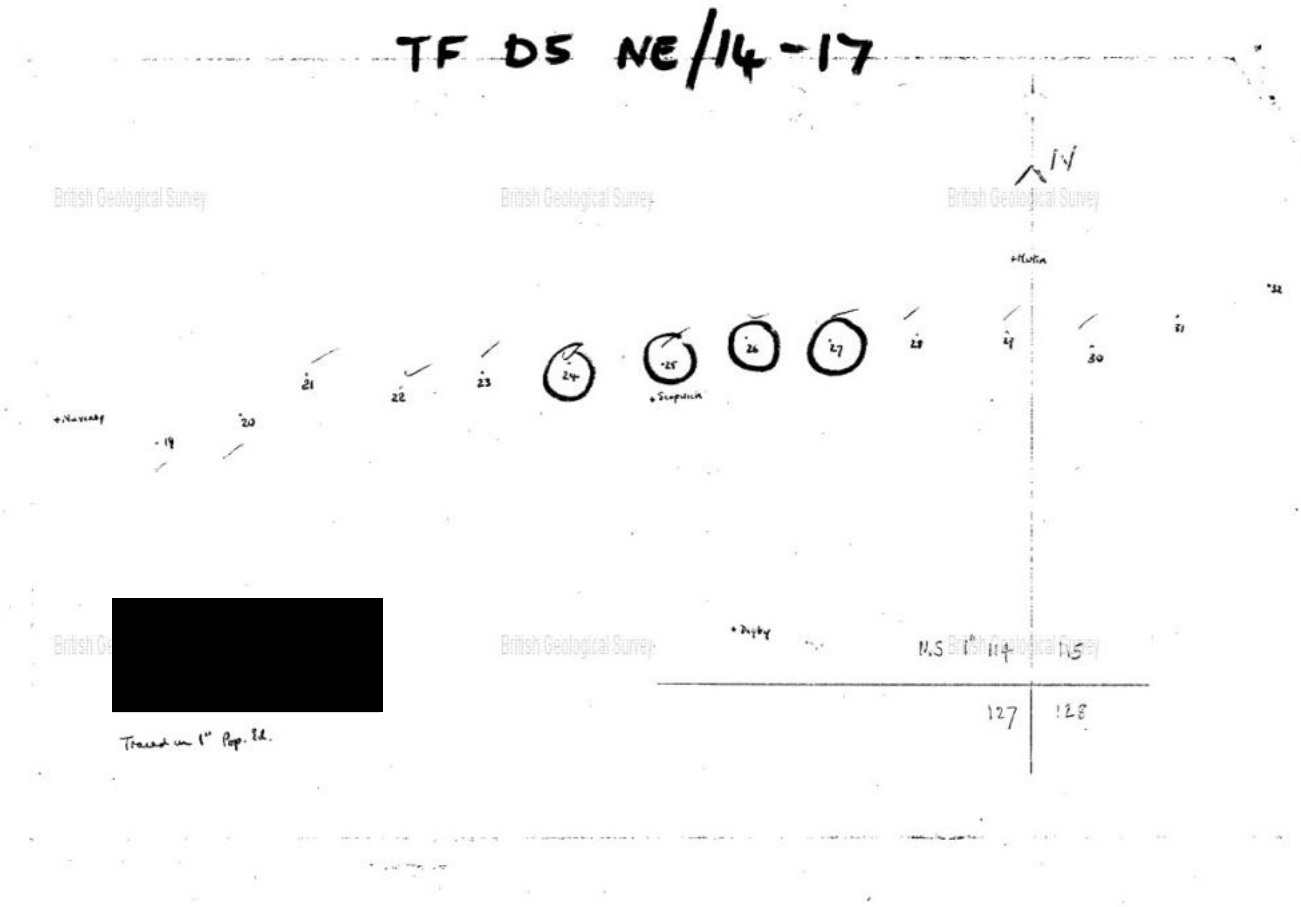
Top soil	1 —	1	—
Mottled clay	39 8	40	12·19
Blue sandy clay	20 6	60	18·21

"? Kellaways under B. Clay. [If so] Chr. is here −36' [or less], but it is + 47' O.D. in No. 26 — giving dip of 83' per ¾ mile = 112 ft. per mile."

British Geological Survey

Version 2.0.6.6

BGS ID: 469024 : BGS Reference: TF05NE15
British National Grid (27700) : 507190,358530
[redacted]



British Geological Survey

Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640

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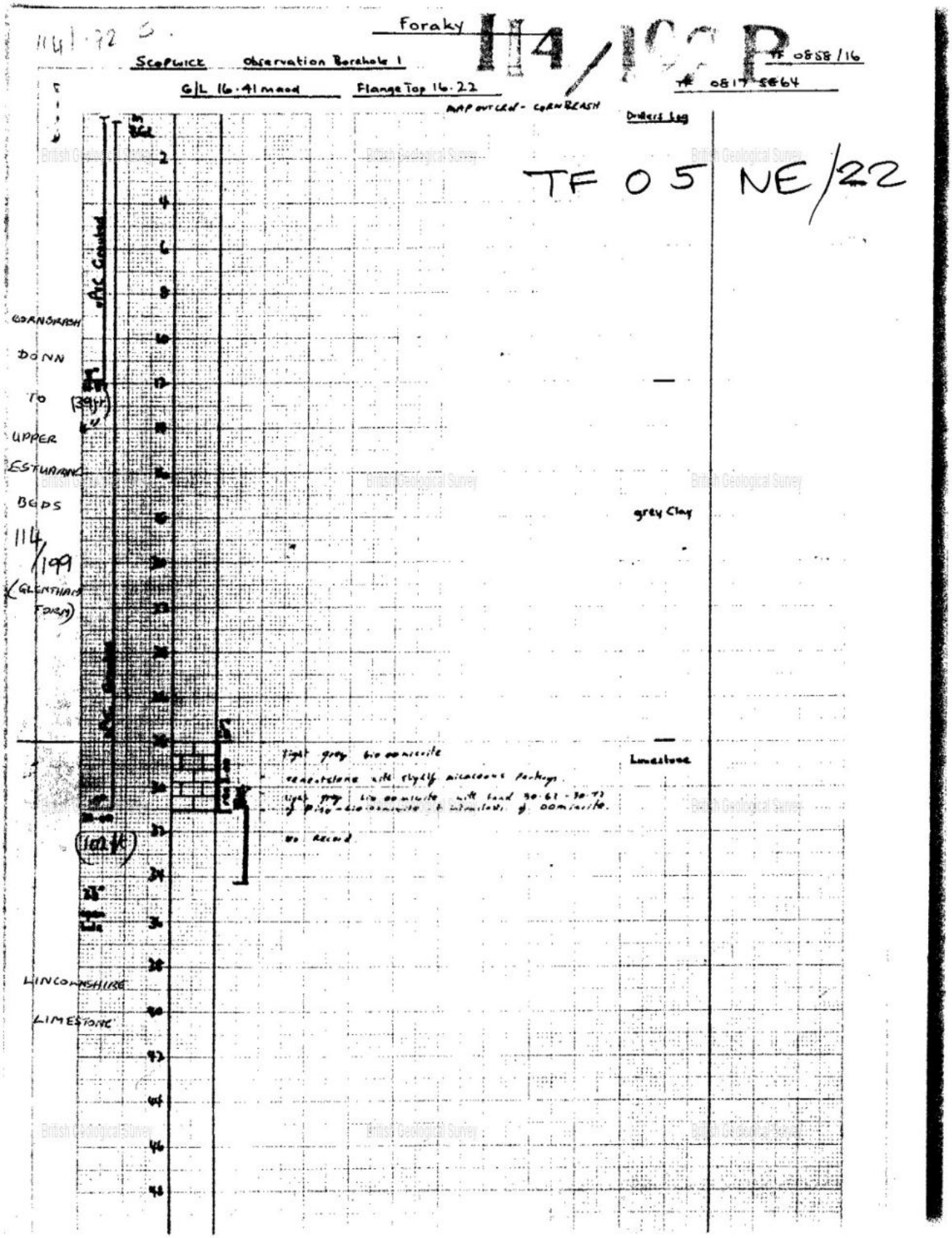

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640

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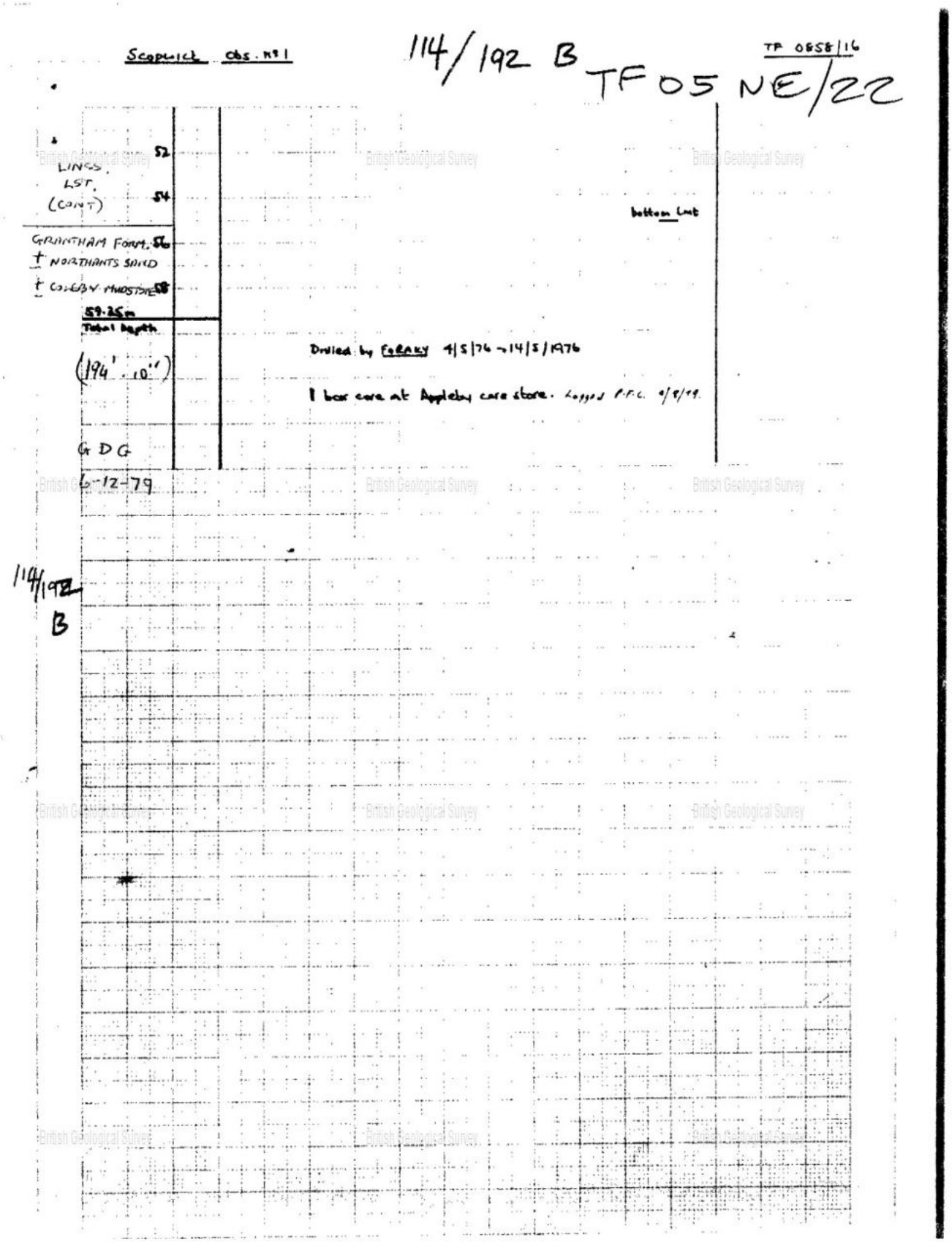


British Geological Survey

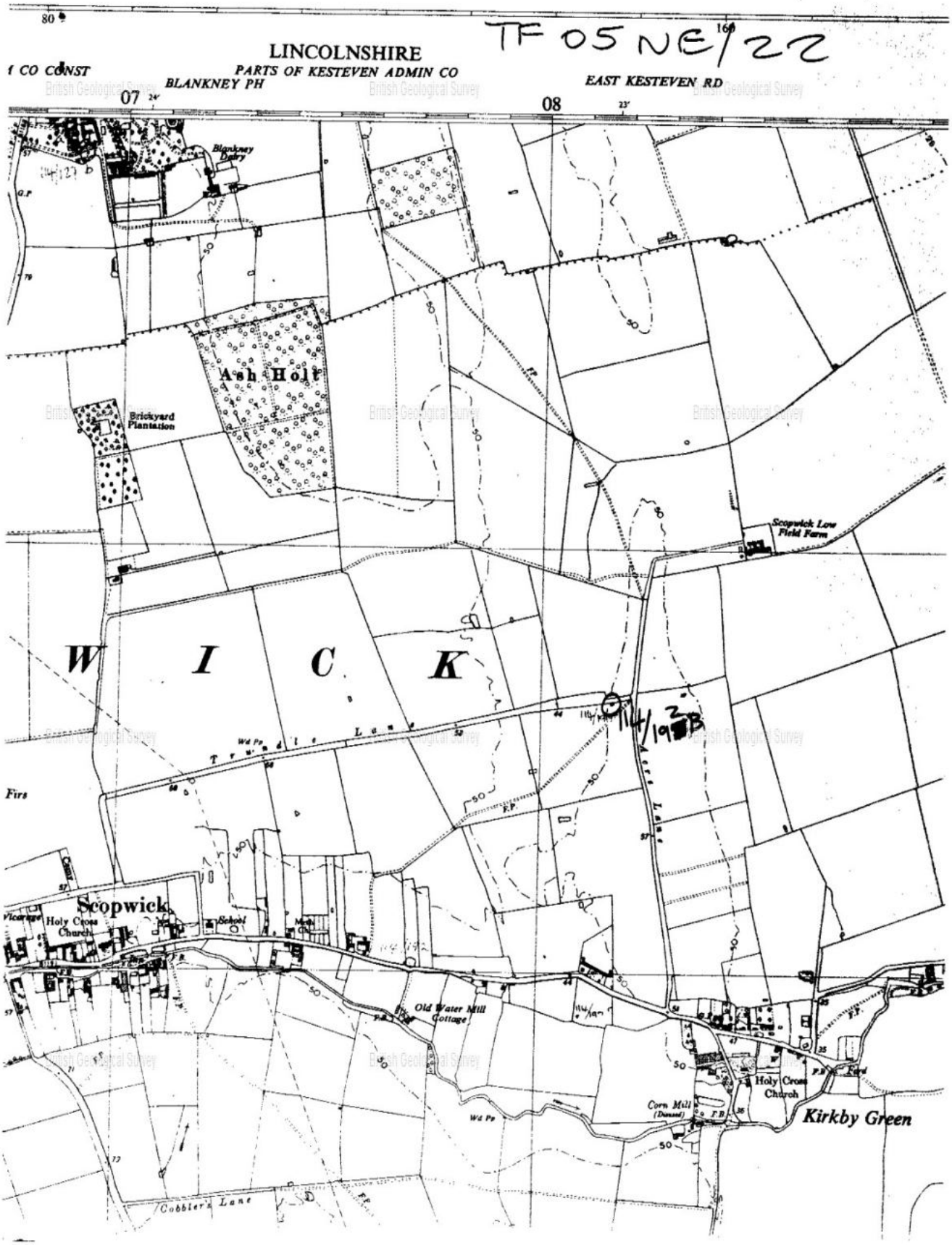
Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640
[redacted]

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

Provisional

TF 05 NE/22



British Geological Survey

Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640
[redacted]

TF05/45

TF 05 58/16

Scopwick obs. No 1

114/192 B

LINCOLNSHIRE LIMESTONE (CONT.) 52

54

bottom Unit

GRANTHAM FM + NORTHAMPTON SAND + COCKEBY MUDSTONE 56

58

59.25m Total depth

(194'.10")

Drilled by Foraky 4/5/76 - 14/5/1976

1 box core at Appleby core store. Logged P.F.C. 4/9/79

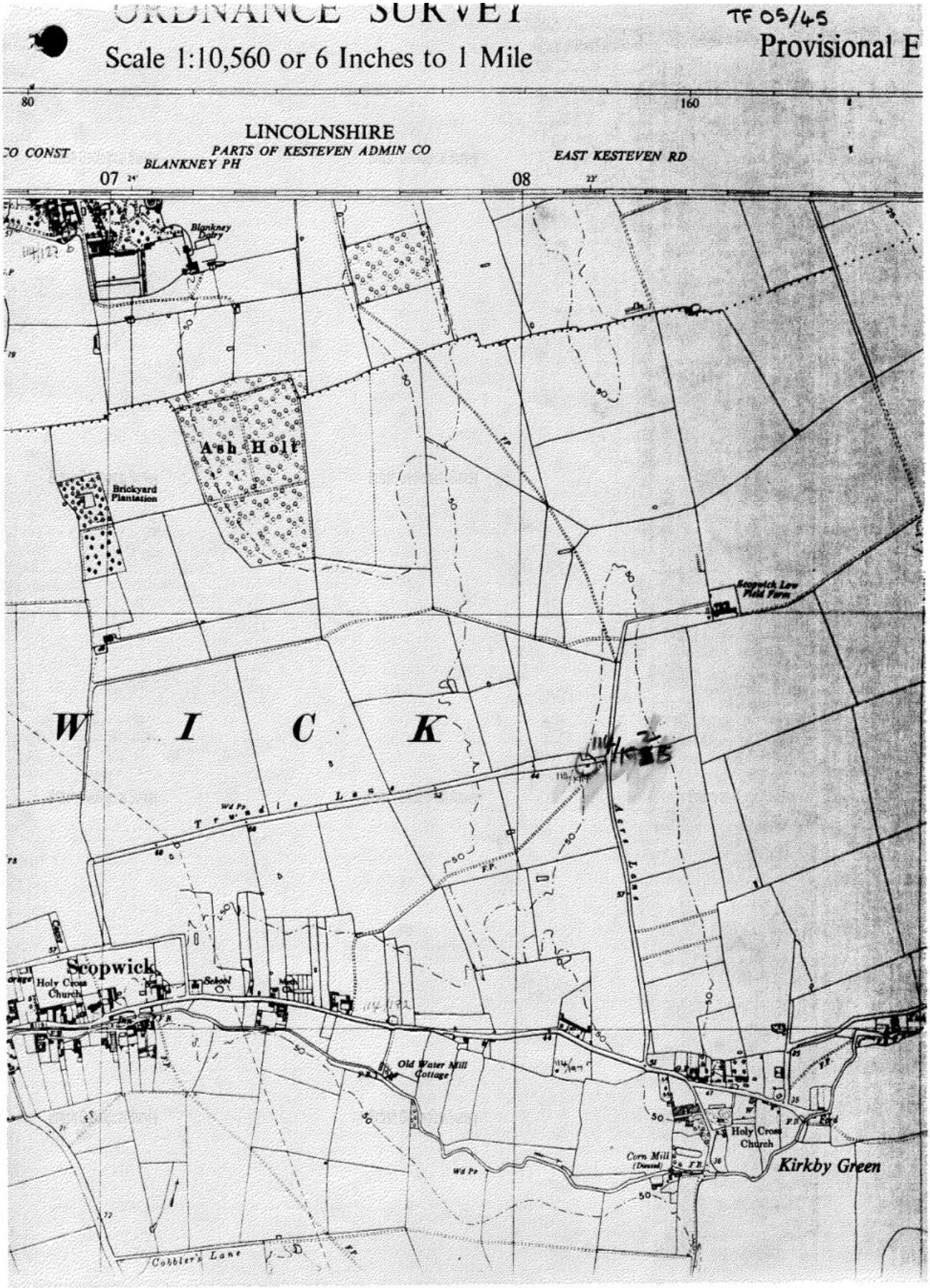
PER. G.D.G. 6.12.79.

114/192 B

British Geological Survey

Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640
[redacted]


ORDNANCE SURVEY
TF 05/45
Provisional E
Scale 1:10,560 or 6 Inches to 1 Mile
80
160
LINCOLNSHIRE
PARTS OF KESTEVEN ADMIN CO
BLANKNEY PH
EAST KESTEVEN RD
07
08
Blankney Dairy
Ash Holt
Brickyard Plantation
Scopwick Low Field Farm
W I C K
Scopwick
Holy Cross Church
School
Old Water Mill Cottage
Holy Cross Church
Corn Mill (Disused)
Kirkby Green
Cobbler's Lane

APPENDIX E8 BGS BOREHOLE LOGS – ZONE J

BGS ID: 469026 : BGS Reference: TF05NE17
British National Grid (27700) : 509541,358809
[redacted]

RECORD of ~~WELL or~~ BORING (Nos. 19–29)

Survey No.
1" N.S. 114
1" O.S.

Across the outcrop of the Lincolnshire Limestone, 9 miles S. of Lincoln.

Town, Village, &c. County Lincs Six-inch map

Exact site (unless a tracing from a map is supplied, give distance and direction from parish church, cross-roads, or other object shown on maps). Description of site made by G.W.D. from the (see Tracing) tracing and is on a 1" scale. Popular Edition (Sheet of one-inch map. (Square

Surface level of ground ft. above Ordnance Datum. Well or Bore commenced at ft. below surface level of ground.

Sunk ft., diameter ft. Bored ft.; diameter of borings at top 6 in., at bottom 6 in.

Details of lining tubes (internal diameters preferred)
All the bores were backfilled to take explosives (for the seismic method of geophysical survey)

Water struck at depths of (feet)

Rest-level of water below above top of well or bore ft. Pumping level ft. Time of recovery hours.

Suction at ft. depth. Yield: (i) on test galls. per, (ii) normal galls. per

Quality (attach copy of analysis if available)

Made by [redacted] Date of boring Nov.-Dec. 1930

Informat

(For Survey use only).

	THICKNESS.	DEPTH.
TF05 NE/14 +15		

Nos. 24 + 25 Records of 1" not received. No. 24 was 64 chains W.N.W of Scopwick church, & just N. of the Navenby Road. No. 25 was 26 chains N by E of Scopwick church and 26 chains E of the Blankney road at the turning to Navenby & Lincoln.

TF05 NE/16

No. 26. Scopwick parish; on the boundary, 78 chains E.N.E of Scopwick church and about 9 chains W.S.W of "Scopwick Lodge Fm." [another near Scopwick Lodge & bore 23]. O.D. [just below 50' contour] say 49'. No water met with

	Metres	Metres
Mould	0 5	
Soil & stones	— 6	— 60
Limestone	1 3	1 90·53
Marked clay	5 12	6 93·06
Clay	20 61	8 92·67
Hard sandy clay	39 316	45 74·63
	123 66	60 18·29

"Bore is in Corallian outcrop & probably unfossiliferous. ? there is Ox. Oolite lst"

TF05NE17 MARTIN PARISH BORE NO. 27 TF 09541 58809

TF05 NE/17

No. 27. Martin parish, on the Timberland boundary. 8 chains E of the railway at Scopwick Station and 37 chains N. by E of bridge (or level crossing ?) O.D. (just below 25' contour) say 24'. Rest water-level 3 ft. down.

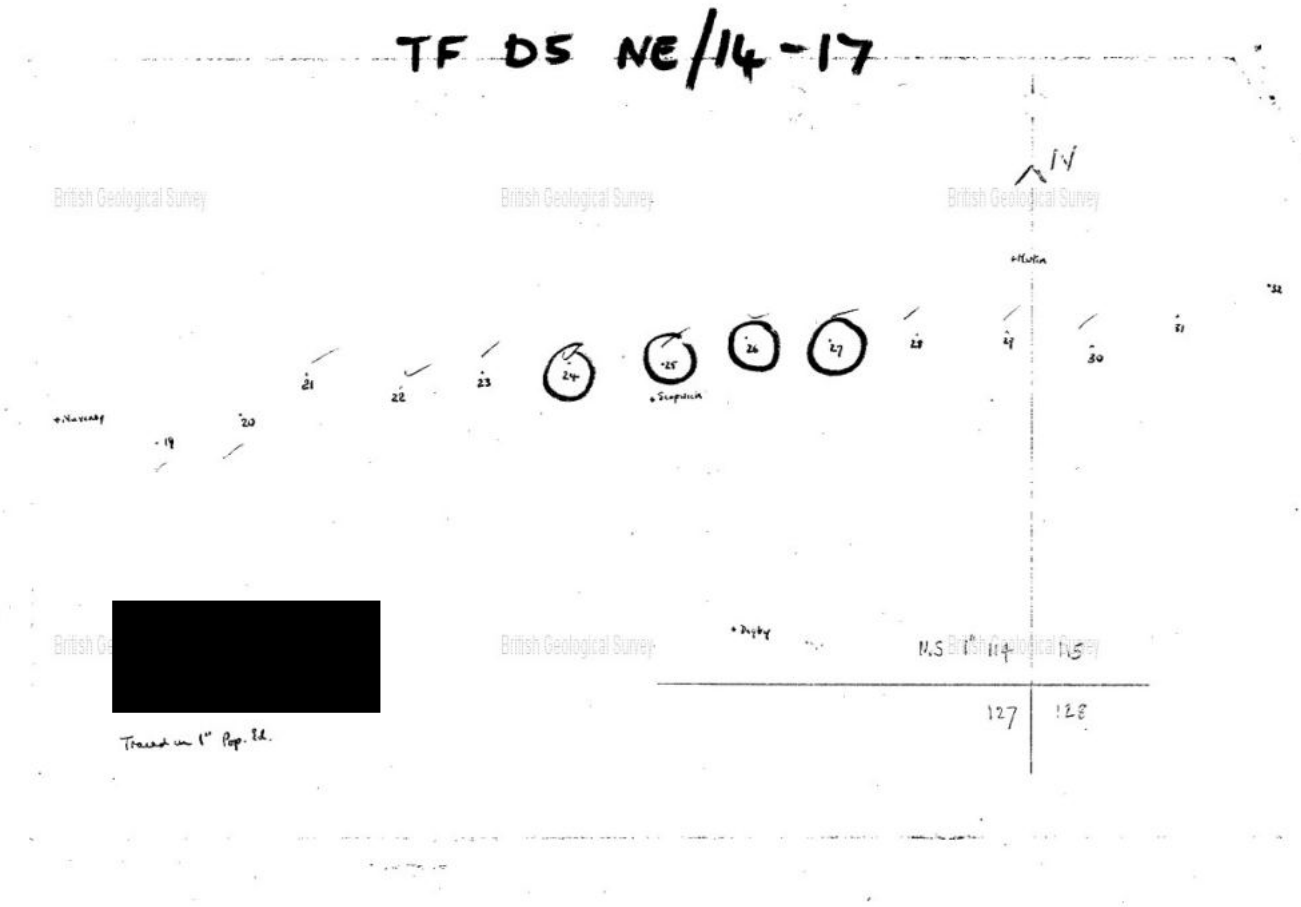
Top soil	1 —	1 —
Marked clay	39 89	40 12·19
Blue sandy clay	20 610	60 18·21

"? Kellaways under B. Clay. [If so] Chr. is here −36' [or less], but if as in + 47' O.D. in No. 26 — giving dip of 83' per 3/4 mile = 112 ft. per mile."

British Geological Survey

Version 2.0.6.6

BGS ID: 469026 : BGS Reference: TF05NE17
British National Grid (27700) : 509541,358809
[redacted]



British Geological Survey

Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640

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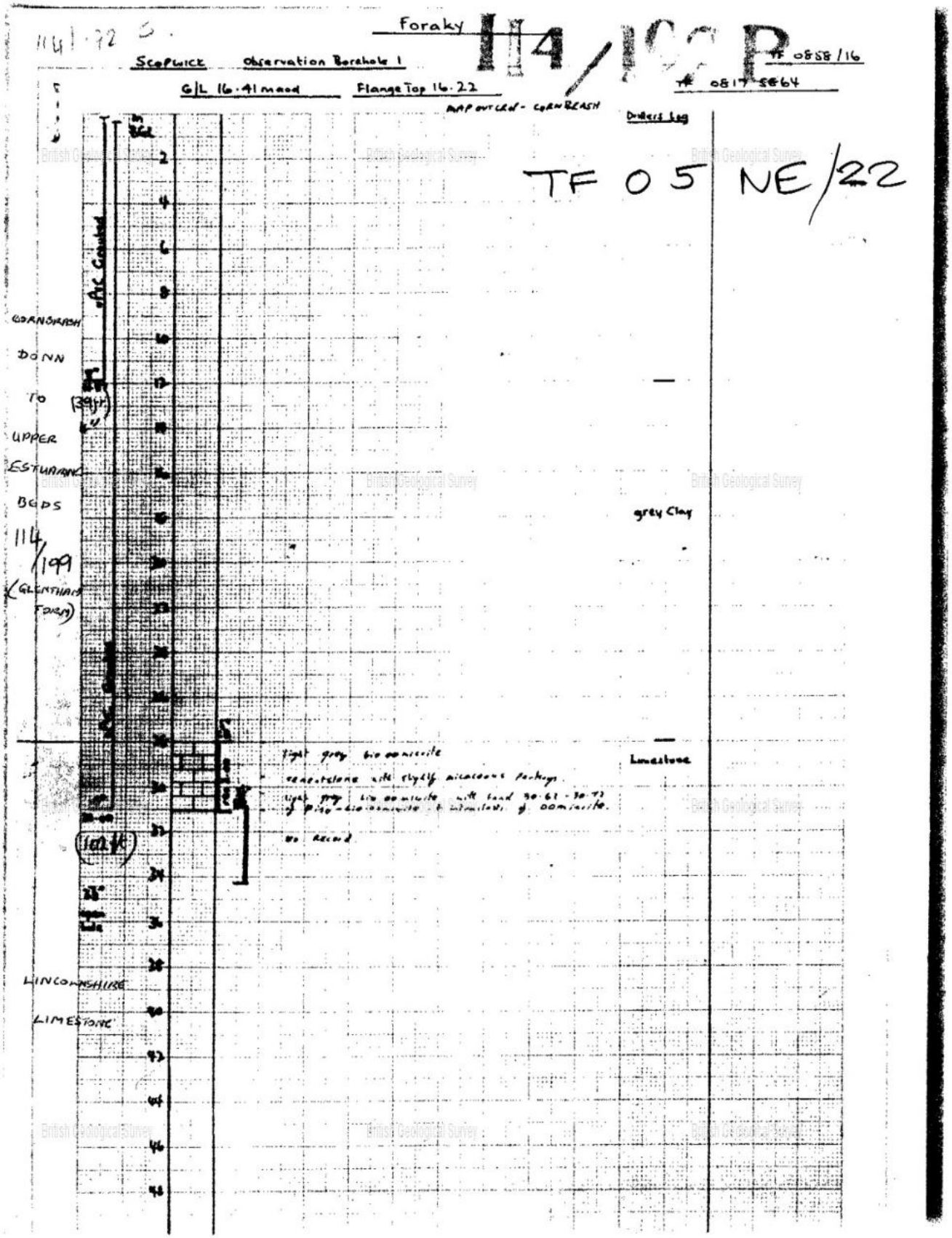
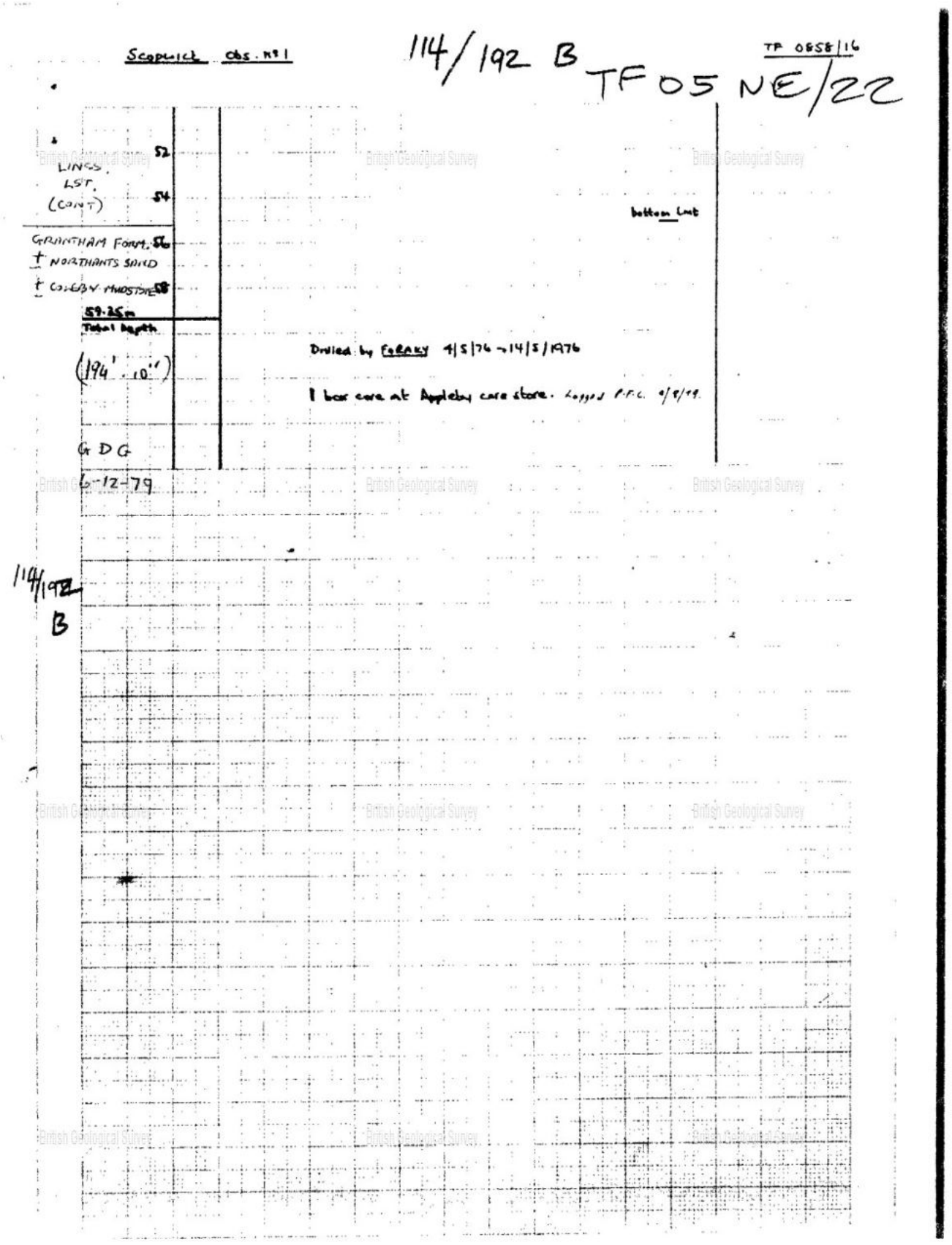


BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640

[redacted]



British Geological Survey

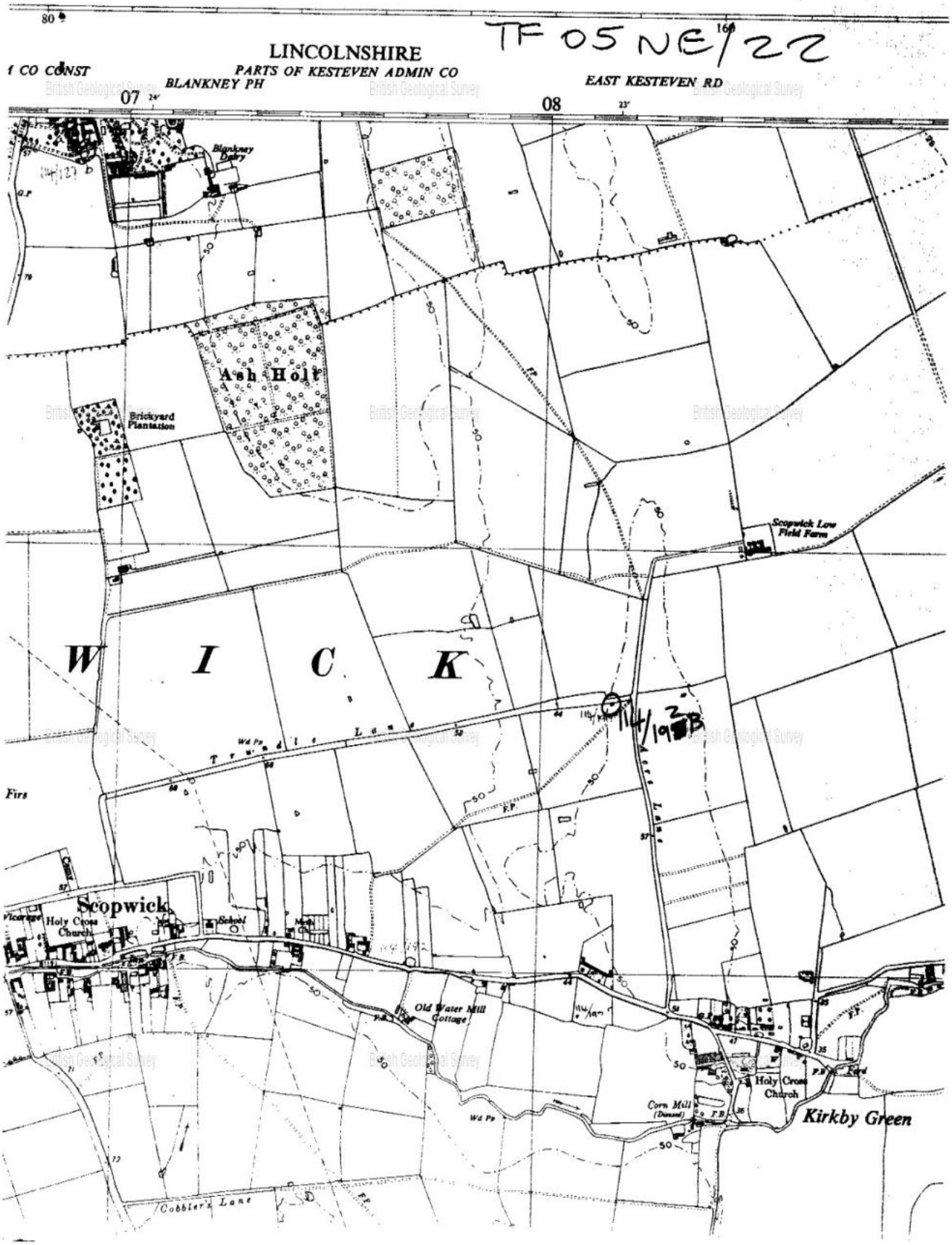
Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640
[redacted]

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

Provisional

TF 05 NE/22



British Geological Survey

Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640
[redacted]

TF05/45

TF 05 58/16

Scopwick obs. No 1

114/192 B

LINCOLNSHIRE LIMESTONE (CONT.) 52

54

bottom Unit

GRANTHAM FM + NORTHAMPTON SAND + COCKEBY MUDSTONE 56

58

59.25m Total depth

(194'.10")

Drilled by Foraky 4/5/76 - 14/5/1976

1 box core at Appleby core store. Logged P.F.C. 4/9/79

PER. G.D.G. 6.12.79.

114/192 B

British Geological Survey

Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640
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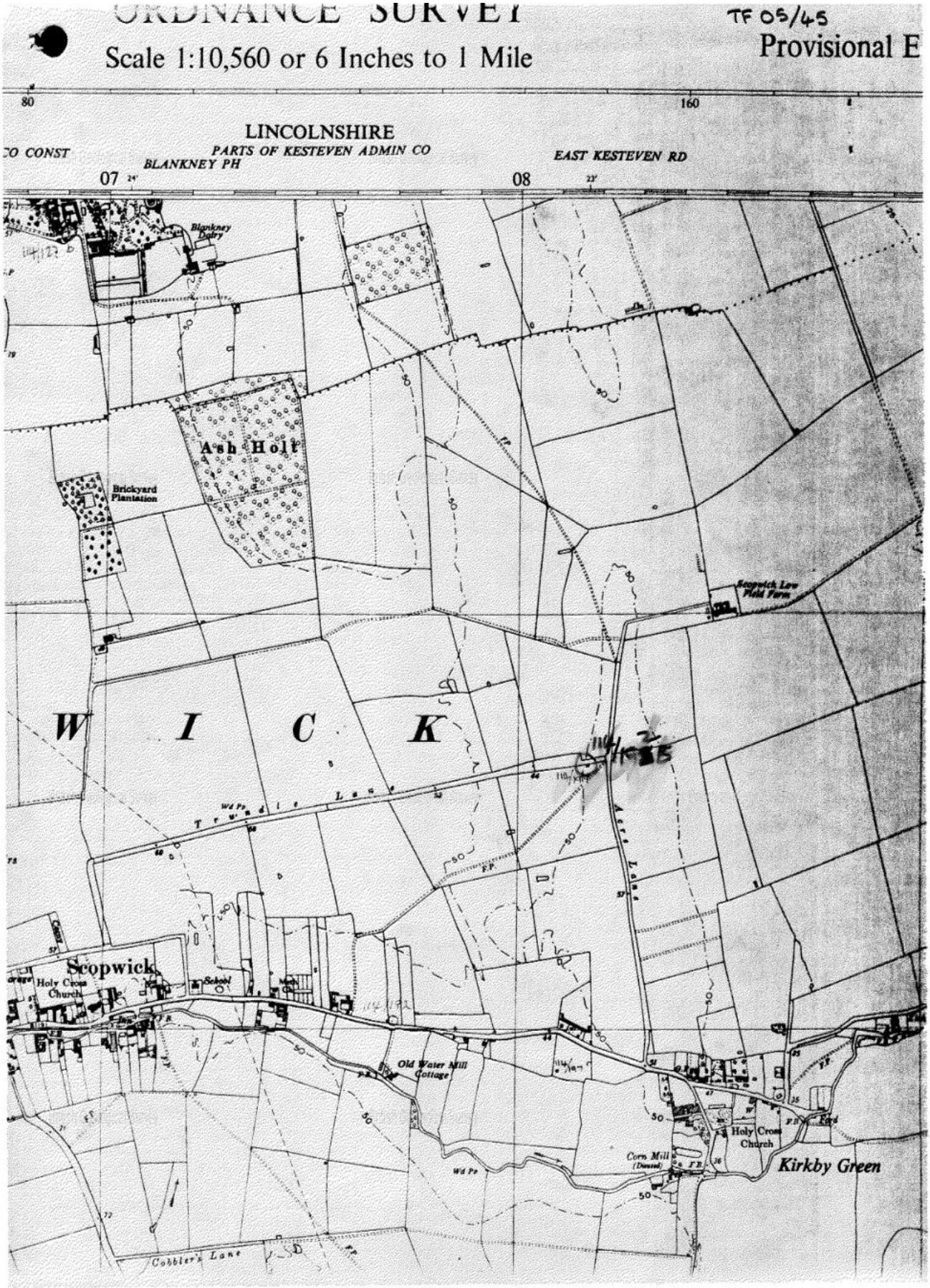

ORDNANCE SURVEY
TF 05/45
Provisional E
Scale 1:10,560 or 6 Inches to 1 Mile
80
160
LINCOLNSHIRE
PARTS OF KESTEVEN ADMIN CO
BLANKNEY PH
EAST KESTEVEN RD
07
08
Blankney Dairy
Ash Holt
Brickyard Plantation
Scopwick Low Field Farm
W I C K
Scopwick
Holy Cross Church
School
Old Water Mill Cottage
Holy Cross Church
Corn Mill (Disused)
Kirkby Green
Cobbler's Lane

British Geological Survey

Version 2.0.6.6

BGS ID: 469033 : BGS Reference: TF05NE24
British National Grid (27700) : 509196,358035
[redacted]

TF05NE24 KIRKBY GREEN OBSERVATION BH NO.2 TF 09196 58035

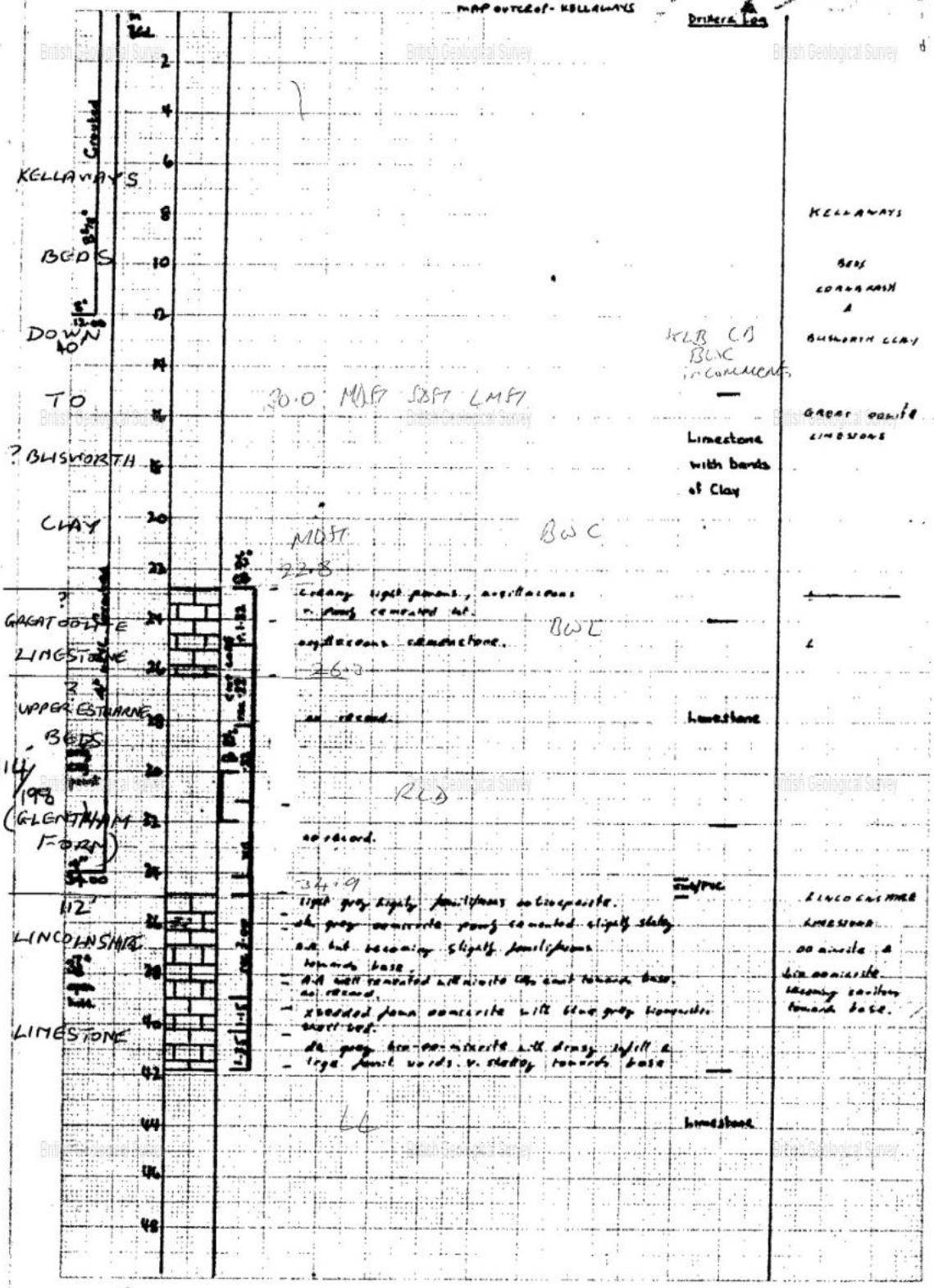
TF 05 NE/24 FORAKY

KIRKBY GREEN Observation Borehole No 2

G/L 8·41 mAOD FLANGE TOP 8·26 mAOD

MAP OUTCROP - KELLAWAYS

Driller's Log



British Geological Survey

Version 2.0.6.6

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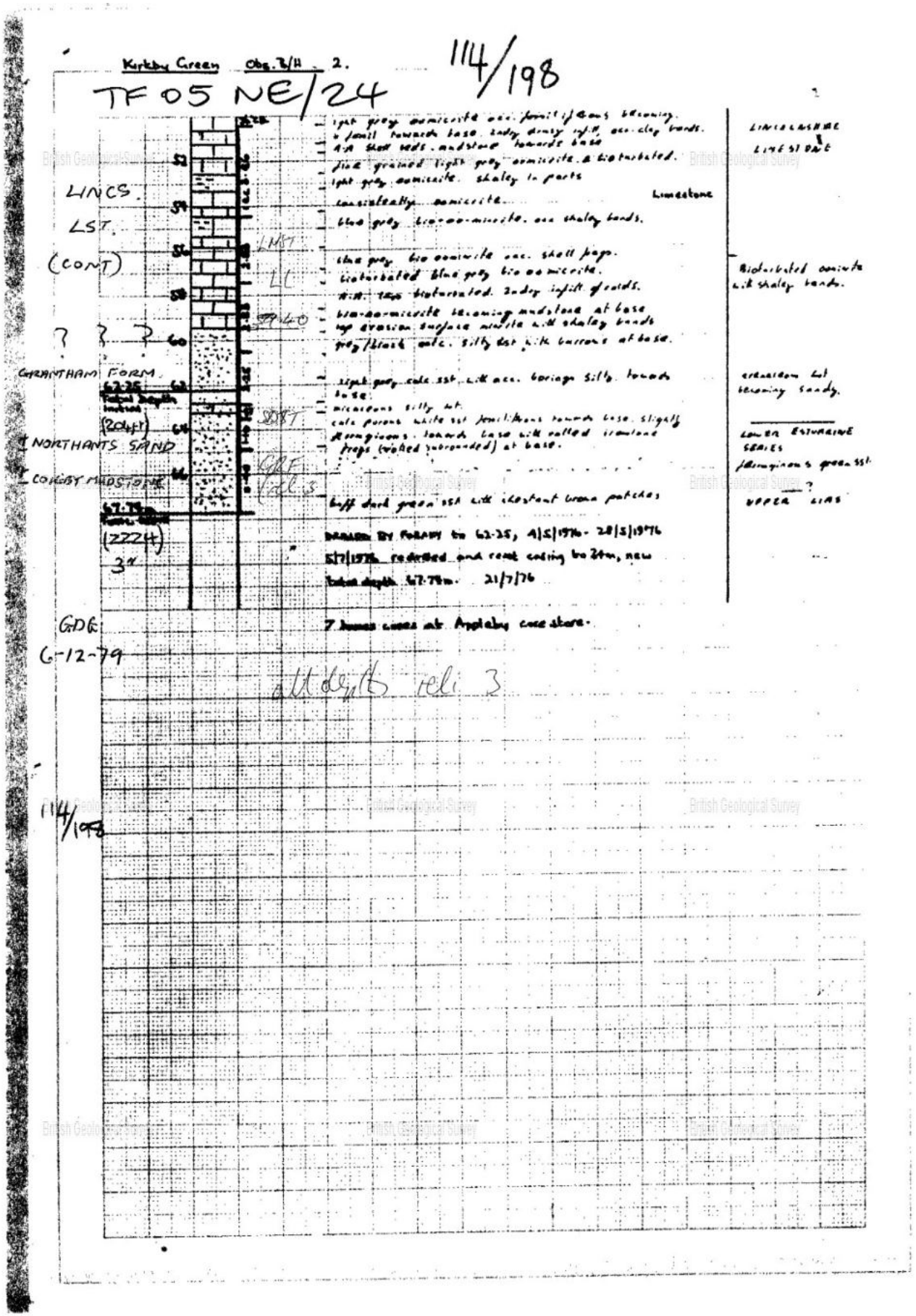
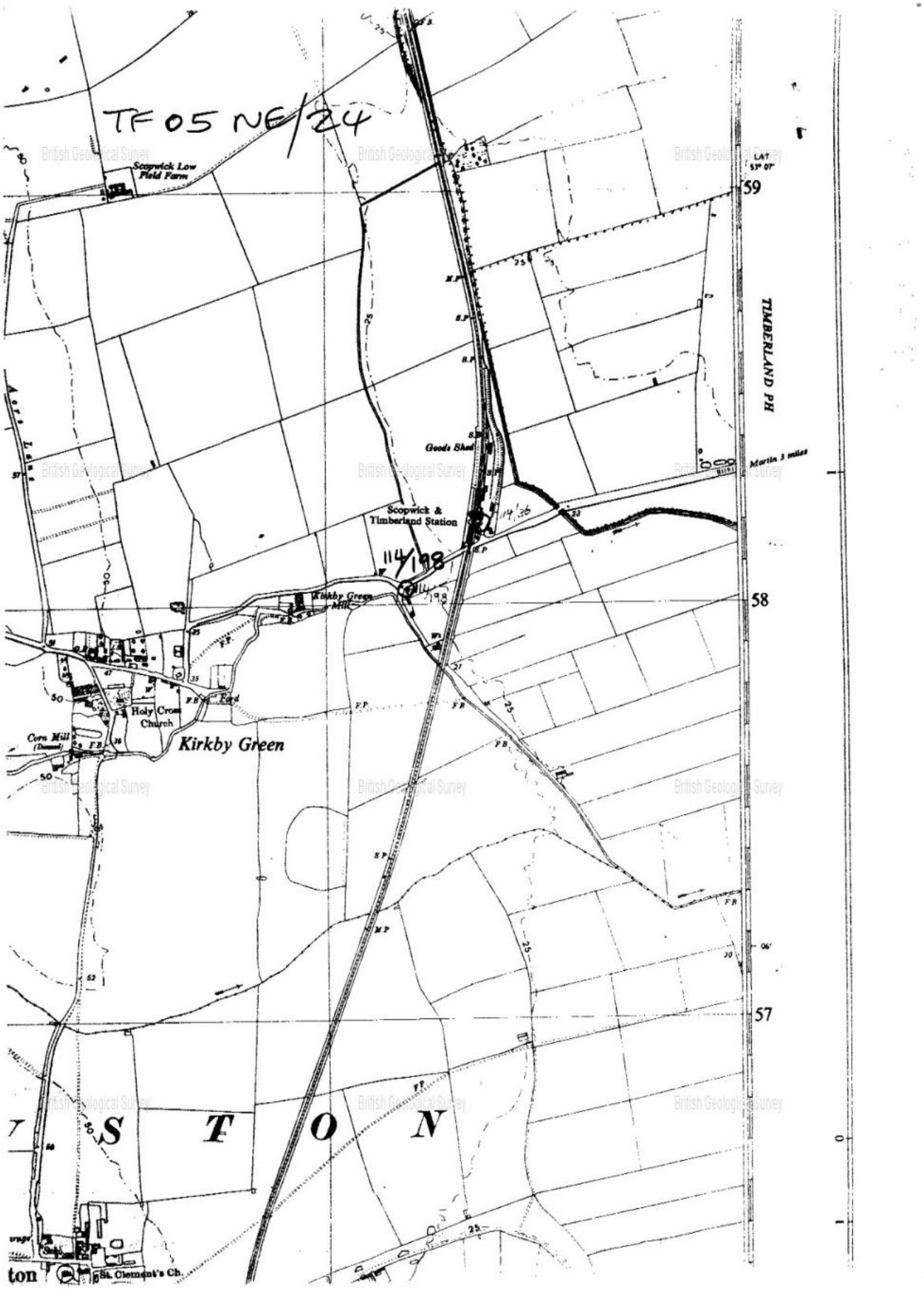
British National Grid (27700) : 509196,358035
[redacted]


Kirkby Green Obs. B/H 2.
114/198
TF 05 NE/24
LINCS. LST. (CONT)
? ? ?
GRANTHAM FORM.
(204ft)
NORTHANTS SAND
CORBY MUDSTONE
(222ft)
3"
GDG
6-12-79
light grey oomicrite occ. fossil if clasts becoming
fossil towards base. Indy dirty infill, occ. clay bands.
shell beds. mudstone towards base
fine grained light grey oomicrite. Bioturbated.
light grey oomicrite. shaley in parts
calcareous oomicrite.
blue grey bio-oo-micrite. occ shaley bands.
blue grey bio oomicrite occ. shell frags.
bioturbated blue grey bio oomicrite.
with traces bioturbated. Indy infill of cavities.
bio-oo-micrite becoming mudstone at base
top erosion surface marked with shaley bands
grey/black calc. silty clst with burrows at base.
light grey calc sst with occ. borings silty towards
base.
micaceous silty clst.
calc porous white sst fossiliferous towards base. slightly
ferruginous towards base with rolled ironstone
frags (rolled subrounded) at base.
buff dark green sst with constant brown patches
Drilling by Foraky to 62.25, 4/2/1976 - 28/2/1976
5/7/1976 re-drilled and reset casing to 24m, new
total depth 67.79m. 21/7/76
7 boxes cores at Anglian core store.
LINCOLNSHIRE LIMESTONE
Bioturbated oomicrite with shaley bands.
estuarine LST becoming sandy.
LOWER ESTUARINE SERIES
ferruginous green sst.
UPPER LIAS
114/198

British Geological Survey

Version 2.0.6.6

BGS ID: 469033 : BGS Reference: TF05NE24
British National Grid (27700) : 509196,358035
[redacted]


TF 05 NE/24
Scopwick Low Field Farm
Goods Shed
Scopwick & Timberland Station
114/98
Kirkby Green Mill
Holy Cross Church
Kirkby Green
Corn Mill
Ford
Martin 3 miles
TIMBERLAND PH
59
58
57
S T O N
St. Clement's Ch.

British Geological Survey

Version 2.0.6.6

BGS ID: 469033 : BGS Reference: TF05NE24
British National Grid (27700) : 509196,358035
[redacted]

FORAKY

TF05/47

KIRKBY GREEN Observation Borehole No 2 OF 0958/20

G/L 8.41 mAOD FLANGE TOP 8.26 mAOD TF 0920 5804.

MAP OUTCROP - KELLAWAYS

14/198

Drillers Log

- 0 m BGL
- 2
- 4
- 6
- 8
- 10
- 12
- 14
- 16
- 18
- 20
- 22
- 24
- 26
- 28
- 30
- 32
- 34
- 36
- 38
- 40
- 42
- 44
- 46
- 48

Grouted

8 5/8"

12.00

40'

4" uPVC Grouted

Cast iron point

4" 34.00

112'

6 3/4" open hole

creamy light grey, argillaceous v. poorly cemented lst.

argillaceous calcarenite.

no record.

Limestone with bands of Clay

Limestone

no record.

light grey highly fossiliferous oolitic calcarenite.

dk grey oomicrite poorly cemented slightly shaly lst but becoming slightly fossiliferous towards base.

A.A well cemented oomicrite lst coral towards base, no record.

x bedded pisan oomicrite with blue grey limestone shell bed.

dk grey bio-oomicrite with drusy infill & large fossil voids. v. shelly towards base

Limestone

Cas/Prc

KELLAWAYS BEDS

DOWN TO ? BRIGHTH CLAY

KELLAWAYS BEDS COMMON & BLISWORTH CLAY

GREAT OOLITE LIMESTONE

GREAT OOLITE LIMESTONE

? UPPER ESTUARINE BEDS. (GLENTHAM FORM)

LINCOLNSHIRE LIMESTONE

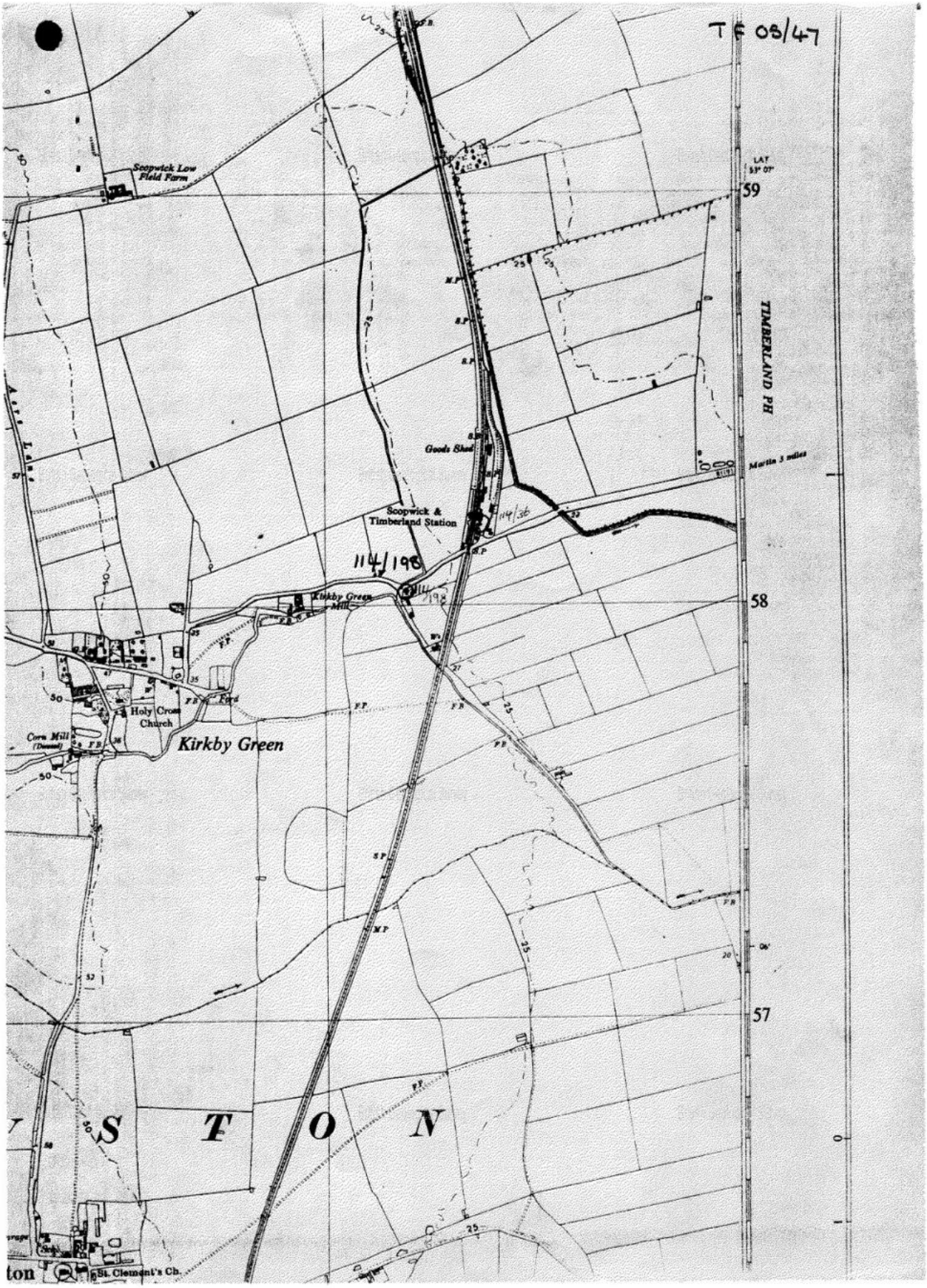
oomicrite & bio oomicrite. becoming cavitory towards base.

LINCOLNSHIRE LIMESTONE

British Geological Survey

Version 2.0.6.6

BGS ID: 469033 : BGS Reference: TF05NE24
British National Grid (27700) : 509196,358035
[redacted]


TF 08/47
Scopwick Low Field Farm
Goods Shed
Scopwick & Timberland Station
114/36
114/198
Kirkby Green Mill
Holy Cross Church
Ford
Corn Mill (Disused)
Kirkby Green
TIMBERLAND PH
59
58
57
S T O N
St. Clement's Ch.

APPENDIX E9 BGS BOREHOLE LOGS – ZONE L

TF06/62

Ae. No. 47816

The Wright Drilling CO.

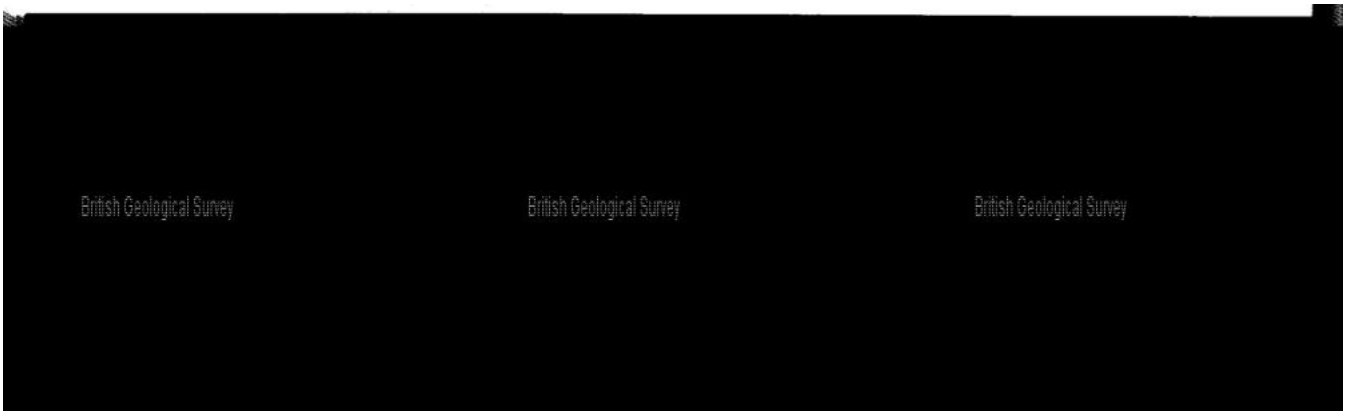
Water divining - Well Drilling - Pump Installations

19 Blakemore Drive, Sutton Coldfield West Midlands B75 7RN
[redacted]

TF06 SW

CLIENT	Mr. D.Johnson			
ADDRESS	The Quarry Heath Lane Metheringham Lincoln LN4 3DH			
YIELD	G.P.H.	750 +	FINISHED DIA	4"
GRID REF.	TF 05645 61594		FINISHED DEPTH	30 METRE
WATER	REST LEVEL	12	METRES	
WATER	DRAW DOWN	1 Meter		
Date	27 March 2008			

FROM METRES	TO METRES	FORMATION	CASED DEPTH
0	12	Limestone	
12	14	Sand	
14	23	Limestone	
23	30	Blue mud stone	30 m


British Geological Survey
British Geological Survey
British Geological Survey

0635 5967 2162

D'ARCY EXPLORATION Co. LTD.

TEST AREA BLANKNEY WELL No. 1

LICENCE N°A 30(a)

"Amended"

POSITION OF WELL: LONG: 0° 24' 35·4" W.
LAT: 53° 7' 24·7" N.

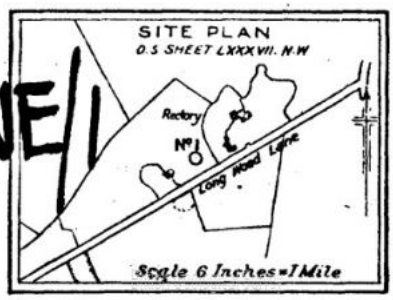
COUNTY: LINCS.

ELEVATION: DERRICK FLOOR:
ROTARY TABLE: 93'
28.3

RIG: ROTARY

DERRICK: 87' JACK KNIFE
POWER: DIESEL

TF05NE/1
128



HISTORY:-

Commenced drilling on 2·9·43
Cemented 11¾" casing at 195'
Completed drilling on 16·9·43 at 3085'

Abandoned
Plugged with cement from bottom – 2750'
Wooden plug placed at 221' & Cement plug from 221' to surface

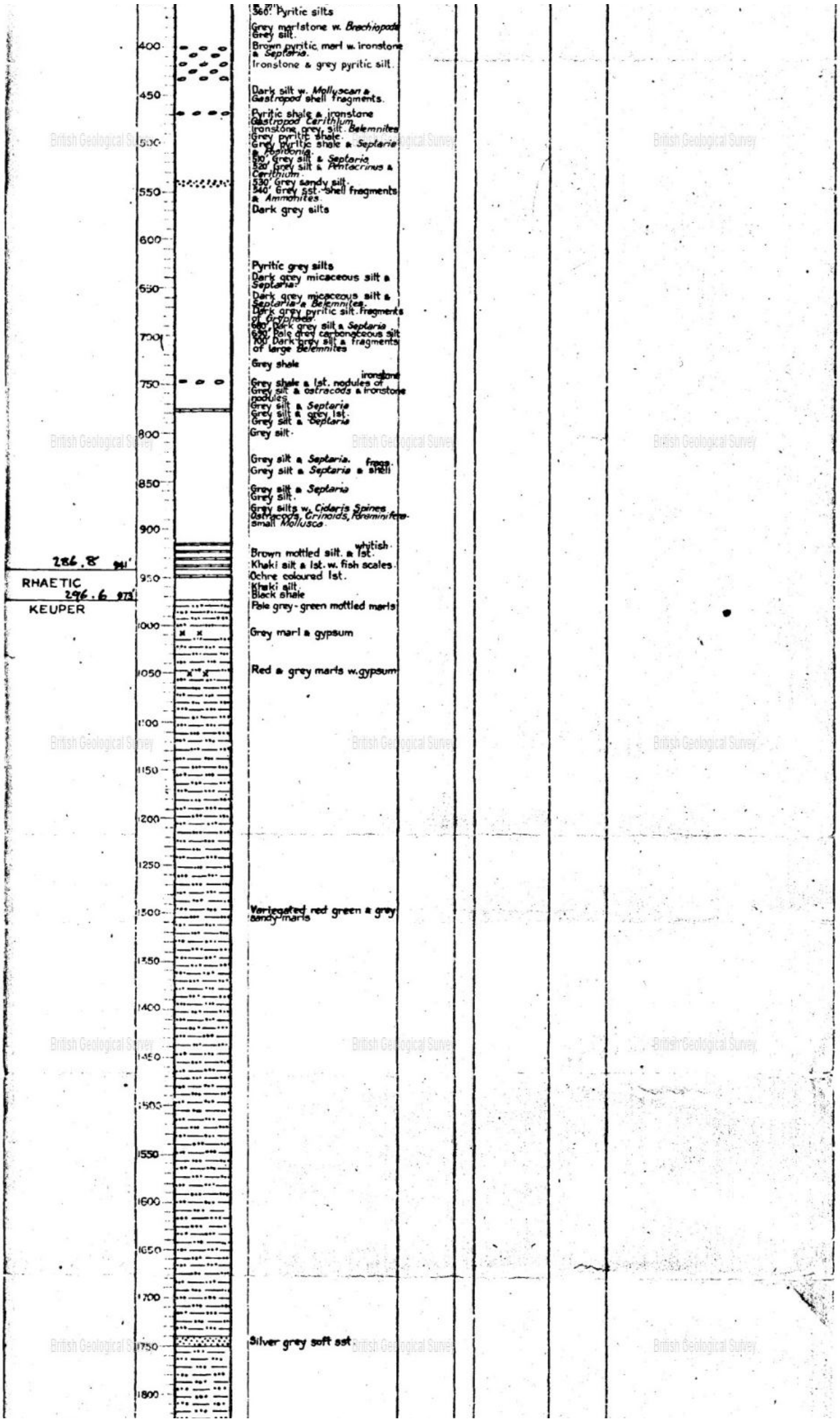
[sited on 6"]

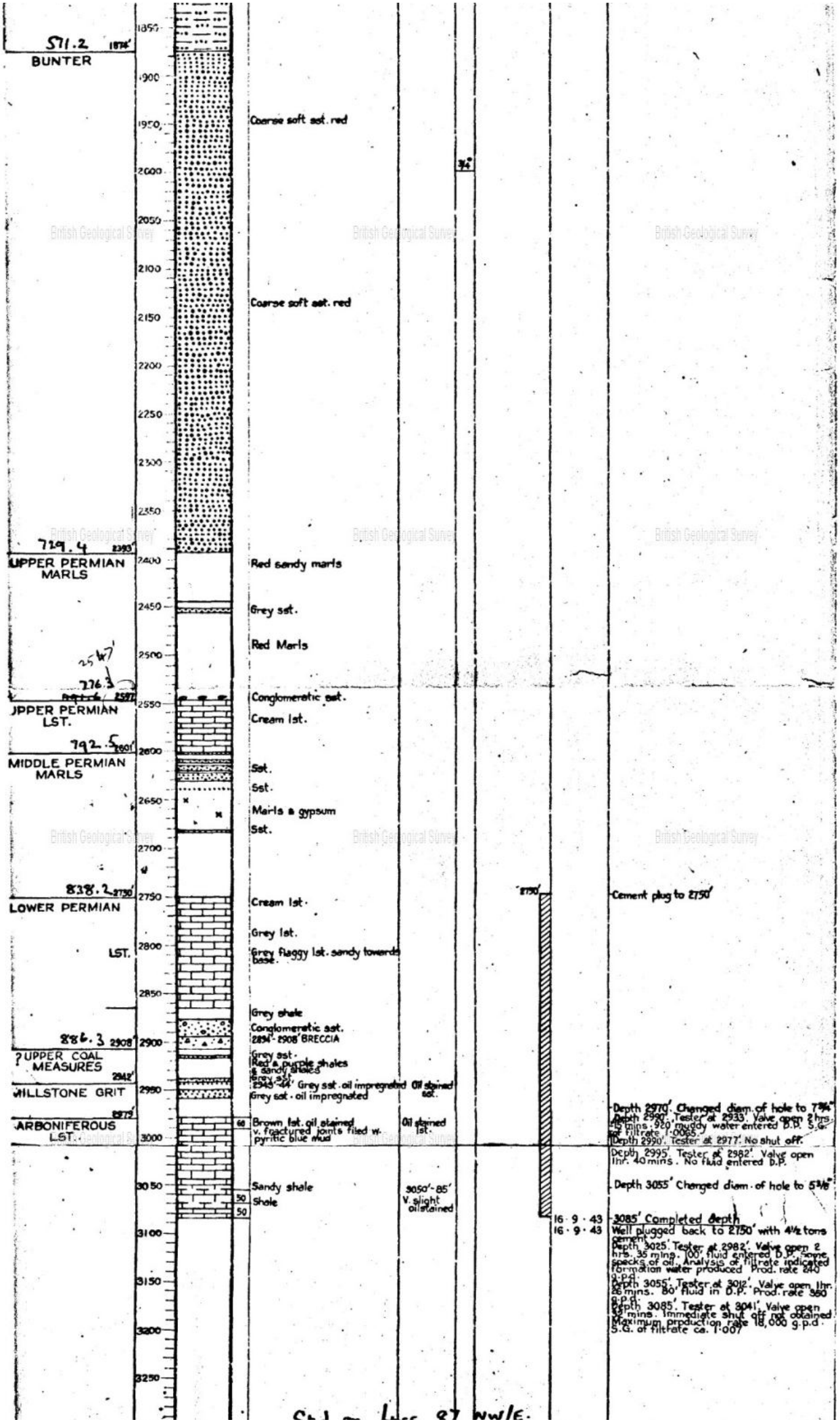
OD cc 80

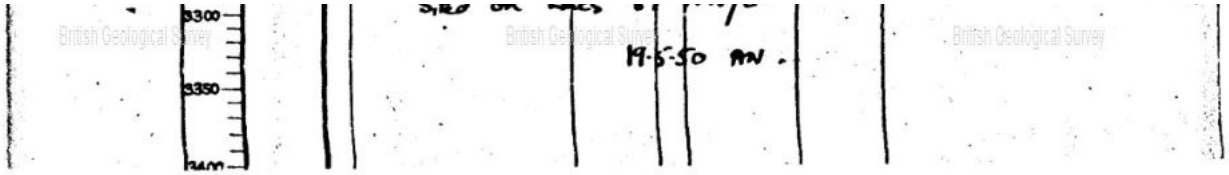
- LEGEND -

- SHALE CLAY MARL OR MUDSTONE
- SANDY SHALE ETC.
- INTER-BEDDED SHALE ETC & SANDSTONE.
- CONGLOMERATE BRECCIA
- PEBBLY SANDSTONE
- SANDSTONE
- COAL
- FIRECLAY.
- IRONSTONE.
- CHERT OR FLINT.
- ANHYDRITE, GYPSUM OR SALT.
- LIMESTONE.
- DOLOMITIC LIMESTONE OR DOLOMITE ROCK.
- IGNEOUS ROCK.

GEOLOGICAL FORMATION	DEPTH IN FEET	LOG	DETAILS OF FORMATION	OIL, GAS WATER COAL SEAMS	CASING	DATE	REMARKS
LINCOLNSHIRE LST.						2·9·43	Commenced drilling 14⅞" diam. hole.
	50		Cream coloured oolitic lst.				
			Cream oolitic lst.				
NORTHAMPTON SANDS 98	100		Calc. sandy flags. Lignite.				
UPPER LIAS 33.2			Grey coarse soft sst.				
			Grey silt.				
	150						
			Soft grey shale w. pyritised Foraminifera.				
	200		Grey shale		11¾		
					221' Wooden Plug	3·9·43	Depth 221' Cemented 11¾" casing at 195' with 4 tons cement. No cement returns. 221' Changed diam. of hole to 8⅝"
82.3 270'	250		Argillaceous lst. w. shales				
MIDDLE LIAS			Thin bedded grey silt.				
	300		Sandy lst. Marlstone Grey sst. Grey silt with pyrite Grey micaceous silt. Grey brown argillaceous lst.				
100.6 330' LOWER LIAS							
	350						


360' Pyritic silts
Grey marlstone w. Brachiopods
Grey silt.
400
Brown pyritic marl w. ironstone
& Septaria.
Ironstone & grey pyritic silt.
450
Dark silt w. Mollyscan &
Gastropod shell fragments.
Pyritic shale & ironstone
Gastropod Cerithium
Ironstone grey silt. Belemnites
Grey pyritic shale.
500
Grey pyritic shale & Septaria
& Rhabdonia.
510' Grey silt & Septaria
520' Grey silt & Pentacrinus &
Cerithium.
530' Grey sandy silt.
540' Grey sst.-shell fragments
& Ammonites.
550
Dark grey silts
600
Pyritic grey silts
Dark grey micaceous silt &
Septaria.
650
Dark grey micaceous silt &
Septaria & Belemnites.
Dark grey pyritic silt. fragments
of Gryphaea.
680' Dark grey silt & Septaria
690' Pale grey carbonaceous silt
700' Dark grey silt & fragments
of large Belemnites
700
Grey shale
ironstone
Grey shale & lst. nodules of
Grey silt & ostracods & ironstone
nodules.
750
Grey silt & Septaria
Grey silt & grey lst.
Grey silt & Septaria
800
Grey silt.
Grey silt & Septaria. fragm.
Grey silt & Septaria & shell
850
Grey silt & Septaria
Grey silt.
Grey silts w. Cidaris Spines.
Ostracods, Crinoids, Foraminifera.
small Mollusca.
900
whitish
Brown mottled silt. & lst.
286.8 941'
Khaki silt & lst. w. fish scales.
RHAETIC
Ochre coloured lst.
296.6 973'
Khaki silt.
Black shale
KEUPER
Pale grey-green mottled marls
1000
Grey marl & gypsum
1050
Red & grey marls w. gypsum
1100
1150
1200
1250
1300
Variegated red green & grey
sandy marls
1350
1400
1450
1500
1550
1600
1650
1700
1750
Silver grey soft sst.
1800


571.2 1874'
BUNTER
1850
1900
1950
2000
2050
2100
2150
2200
2250
2300
2350
729.4 2393'
UPPER PERMIAN MARLS
2400
2450
2500
276.3
2550
UPPER PERMIAN LST.
792.5 2601'
2600
MIDDLE PERMIAN MARLS
2650
2700
838.2 2750'
LOWER PERMIAN
2750
LST.
2800
2850
886.3 2908'
2900
? UPPER COAL MEASURES 2942'
WILLSTONE GRIT 2975'
CARBONIFEROUS LST.
3000
3050
3100
3150
3200
3250
Coarse soft sst. red
Coarse soft sst. red
Red sandy marls
Grey sst.
Red Marls
Conglomeratic sst.
Cream lst.
Sst.
Sst.
Marls & gypsum
Sst.
Cream lst.
Grey lst.
Grey flaggy lst. sandy towards base.
Grey shale
Conglomeratic sst.
2894'-2908' BRECCIA
Grey sst.
Red & purple shales & sandy shales
Grey sst.
2943'-44' Grey sst. oil impregnated
Grey sst. oil impregnated
Oil stained sst.
Brown lst. oil stained
v. fractured joints filled w. pyritic blue mud
Oil stained lst.
Sandy shale
Shale
3050'-85' V. slight oil stained
34°
2750'
Cement plug to 2750'
Depth 2970' Changed diam. of hole to 7¾"
Depth 2990'. Tester at 2933'. Valve open 2 hrs. 15 mins. 920' muddy water entered D.P. S.G. of filtrate 1.0065.
Depth 2990'. Tester at 2977'. No shut off.
Depth 2995'. Tester at 2982'. Valve open 1hr. 40 mins. No fluid entered D.P.
Depth 3055' Changed diam. of hole to 5⅜"
16 · 9 · 43
16 · 9 · 43
3085' Completed depth
Well plugged back to 2750' with 4½ tons cement.
Depth 3025'. Tester at 2982'. Valve open 2 hrs. 35 mins. 100' fluid entered D.P. some specks of oil. Analysis of filtrate indicated formation water produced. Prod. rate 240 g.p.d.
Depth 3055'. Tester at 3012'. Valve open 1hr. 26 mins. 80' fluid in D.P. Prod. rate 360 g.p.d.
Depth 3085'. Tester at 3041'. Valve open 39 mins. Immediate shut off not obtained. Maximum production rate 18,000 g.p.d. S.G. of filtrate ca. 1.007



BGS ID: 469003 : BGS Reference: TF05NE1
British National Grid (27700) : 506397,359695

[redacted]

0635 5987 1 14/128 TF05NE/1

(and w 0638 5?)

D'ARCY EXPLORATION Co. LTD.

TEST AREA BLANKNEY WELL No. 1

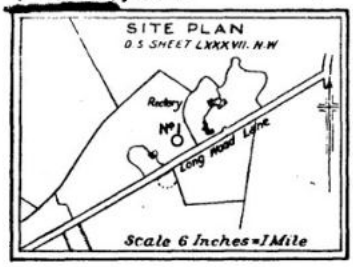
LICENCE N°A 30(a)

→ SEE "AMENDED" (1) ← 1" N.S. 114; O.S. 83

POSITION OF WELL: LONG: 0° 24' 35·4" W. LAT: 53° 7' 24·7" N.
COUNTY: LINCS:

ELEVATION: DERRICK FLOOR:
ROTARY TABLE: 93'

RIG: ROTARY DERRICK: 87' JACK KNIFE
POWER: DIESEL



HISTORY:-

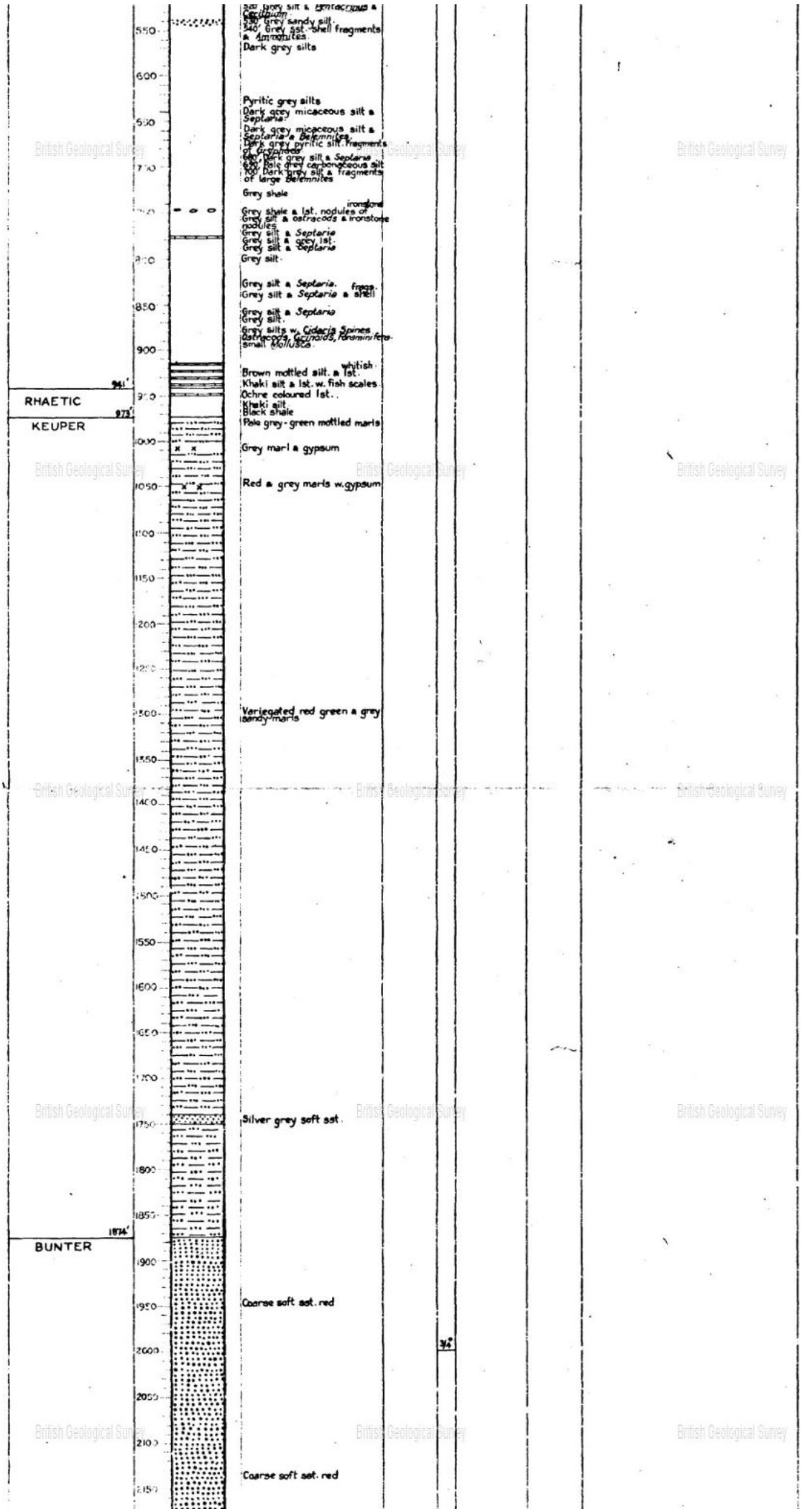
Commenced drilling on 2·9·43
Cemented 11¾" casing at 195'
Completed drilling on 16·9·43 at 3085'

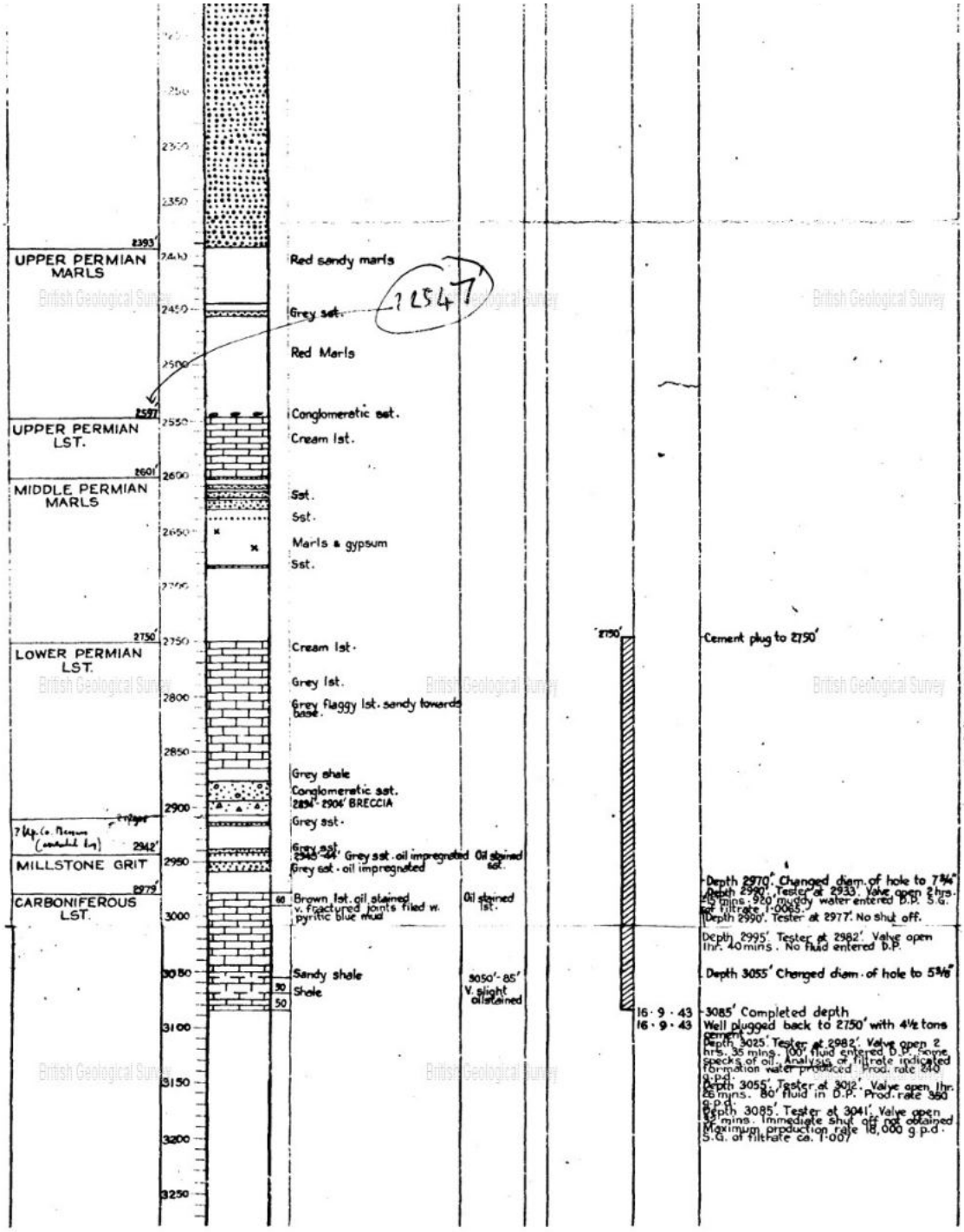
Abandoned
Plugged with cement from bottom - 2750'
Wooden plug placed at 221' & Cement plug from 221' to surface

- LEGEND -

- SHALE CLAY, MARL OR MUDSTONE.
- SANDY SHALE ETC.
- INTER-BEDDED SHALE ETC & SANDSTONE.
- CONGLOMERATE BRECCIA
- PEBBLY SANDSTONE
- SANDSTONE
- COAL
- FIRECLAY.
- IRONSTONE.
- CHERT OR FLINT.
- ANHYDRITE, GYPSUM OR SALT.
- LIMESTONE.
- DOLOMITIC LIMESTONE OR DOLOMITE ROCK.
- IGNEOUS ROCK.

GEOLOGICAL FORMATION	DEPTH IN FEET	LOG	DETAILS OF FORMATION	OIL, GAS, WATER, COAL SEAMS	CASING	DATE	REMARKS
			Cream coloured oolitic lst.			2·9·43	Commenced drilling 14⅞" diam. hole.
	50		Cream oolitic lst.				
	100		Calc. sandy flags. Lignite.				
			Grey coarse soft sst.				Revised Estimate £ [illegible]
	140'		Grey silt.				
UPPER LIAS	150		Soft grey shale w. pyritised Foraminifera.				
	200		Grey shale		11¾" 221' Wooden Plug	3·9·43	Depth 221' Cemented 11¾" casing at 195' with 4 tons cement. No cement returns. 221' Changed diam. of hole to 8⅝"
	250		Argillaceous lst. w. shales				
	270'		Thin bedded grey silt.				
MIDDLE LIAS	300		Sandy lst. Marlstone Grey sst.				
	330'		Grey silt with pyrite Grey micaceous silt.				
LOWER LIAS	350		Grey-brown argillaceous lst. & silt. 360' Pyritic silts				
			Grey marlstone w. Brachiopods Grey silt.				
	400		Brown pyritic marl w. ironstone & Septaria. Ironstone & grey pyritic silt.				
	450		Dark silt w. Mollyscan & Gastropod shell fragments.				
	500		Pyritic shale & ironstone Gastropod Cerithium Ironstone, grey silt Belemnites Grey pyritic shale. Grey pyritic shale & Septaria & Pentacrinus 510' Grey silt & Septaria				


Grey silt & Entracrinus & Cardium
530' Grey sandy silt.
540' Grey sst. shell fragments & Ammonites.
Dark grey silts
Pyritic grey silts
Dark grey micaceous silt & Septaria?
Dark grey micaceous silt & Septaria & Belemnites.
Dark grey pyritic silt fragments of Pectinides
Dark grey silt & Septaria
Pale grey carbonaceous silt
Dark grey silt & fragments of large Belemnites
Grey shale
Grey shale & lst. nodules of ironstone
Grey silt & ostracods & ironstone nodules.
Grey silt & Septaria
Grey silt & grey lst.
Grey silt & Septaria
Grey silt.
Grey silt & Septaria. fragm.
Grey silt & Septaria & shell
Grey silt & Septaria
Grey silt.
Grey silts w. Cidaris Spines, ostracods, Gastropods, Foraminifera, small Mollusca.
941'
Brown mottled silt. & lst. whitish
Khaki silt & lst. w. fish scales
RHAETIC
Ochre coloured lst..
973'
Khaki silt
Black shale
KEUPER
Pale grey-green mottled marls
Grey marl & gypsum
Red & grey marls w. gypsum
Variegated red green & grey sandy marls
Silver grey soft sst.
1874'
BUNTER
Coarse soft sst. red
Coarse soft sst. red


UPPER PERMIAN MARLS
2393'
UPPER PERMIAN LST.
2597'
MIDDLE PERMIAN MARLS
2601'
LOWER PERMIAN LST.
2750'
MILLSTONE GRIT
2942'
2979'
CARBONIFEROUS LST.
2350
2400
2450
2500
2550
2600
2650
2700
2750
2800
2850
2900
2950
3000
3050
3100
3150
3200
3250
Red sandy marls
Grey sst.
Red Marls
Conglomeratic sst.
Cream lst.
Sst.
Sst.
Marls & gypsum
Sst.
Cream lst.
Grey lst.
Grey flaggy lst. sandy towards base.
Grey shale
Conglomeratic sst.
2894'-2904' BRECCIA
Grey sst.
Grey sst.
2945'-64' Grey sst. oil impregnated
Grey sst. oil impregnated
Brown lst. oil stained v. fractured joints filled w. pyritic blue mud
Sandy shale
Shale
60
30
50
Oil stained sst.
Oil stained lst.
3050'-85' V. slight oil stained
2750'
Cement plug to 2750'
Depth 2970' Changed diam. of hole to 7 3/4"
Depth 2990'. Tester at 2933'. Valve open 2 hrs. 15 mins. 920' muddy water entered D.P. S.G. of filtrate 1·0085.
Depth 2990'. Tester at 2977'. No shut off.
Depth 2995'. Tester at 2982'. Valve open 1hr. 40 mins. No fluid entered D.P.
Depth 3055' Changed diam. of hole to 5 3/8"
16·9·43 3085' Completed depth
16·9·43 Well plugged back to 2750' with 4½ tons cement
Depth 3025'. Tester at 2982'. Valve open 2 hrs. 35 mins. 100' fluid entered D.P. Some specks of oil. Analysis of filtrate indicated formation water produced. Prod. rate 240 g.p.d.
Depth 3055'. Tester at 3012'. Valve open 1hr. 26 mins. 80' fluid in D.P. Prod. rate 360 g.p.d.
Depth 3085'. Tester at 3041'. Valve open 45 mins. Immediate shut off not obtained. Maximum production rate 18,000 g.p.d. S.G. of filtrate ca. 1·007
British Geological Survey

British Geological Survey

Version 2.0.6.6

BGS ID: 469003 : BGS Reference: TF05NE1
British National Grid (27700) : 506397,359695
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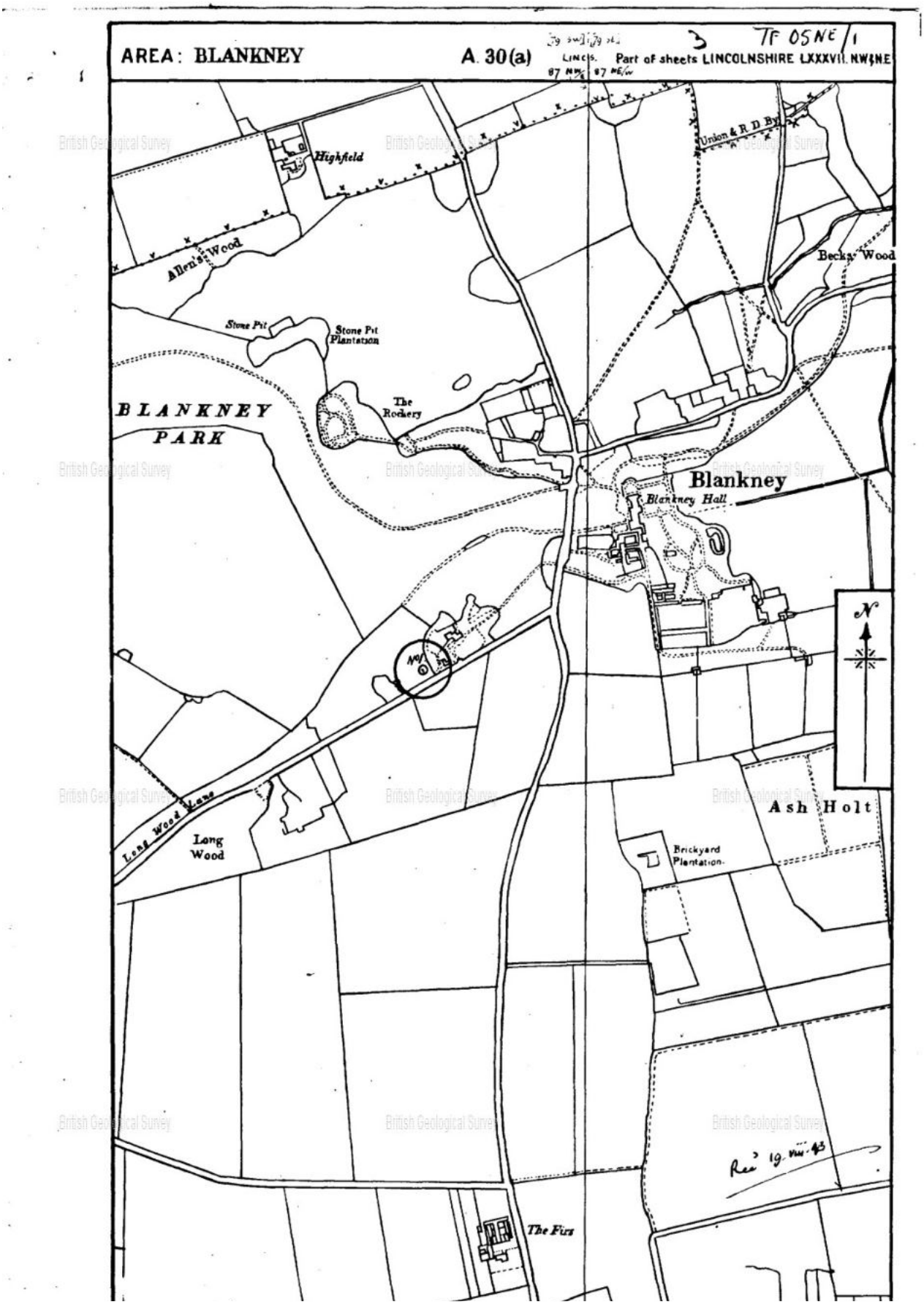
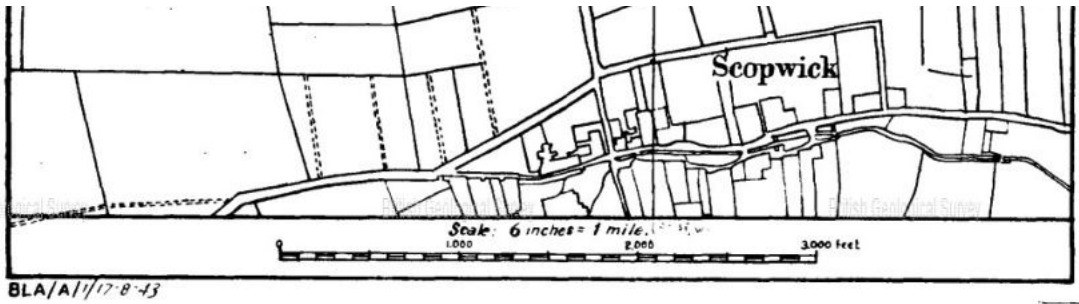




BLA/A/1/17-8-43

BGS ID: 469003 : BGS Reference: TF05NE1
British National Grid (27700) : 506397,359695

[redacted]

D'ARCY EXPLORATION Co. LTD.

TEST AREA BLANKNEY WELL No. 1

TF05/12

LICENCE No. A 30(1) "Arnold"

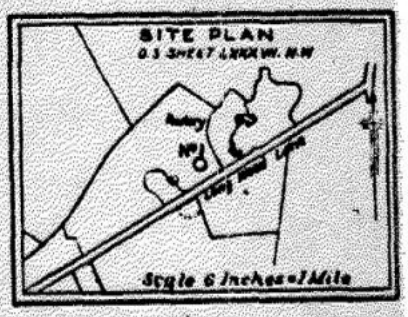
POSITION OF WELL: LONG: 0° 24' 35.4" W. LAT: 53° 7' 24.7" N.

COUNTY: LINCS.

114/128

ELEVATION: DERRICK FLOOR: ROTARY TABLE: 93'

RIG: ROTARY DERRICK: 87' JACK KNIFE POWER: DIESEL



HISTORY:-

Commenced drilling on 2.9.43
Cemented 11¾" casing at 195'
Completed drilling on 16.9.43 at 3086'

Abandoned
Plugged with cement from bottom - 2750'
Wooden plug placed at 221' & Cement plug from 221' to surface

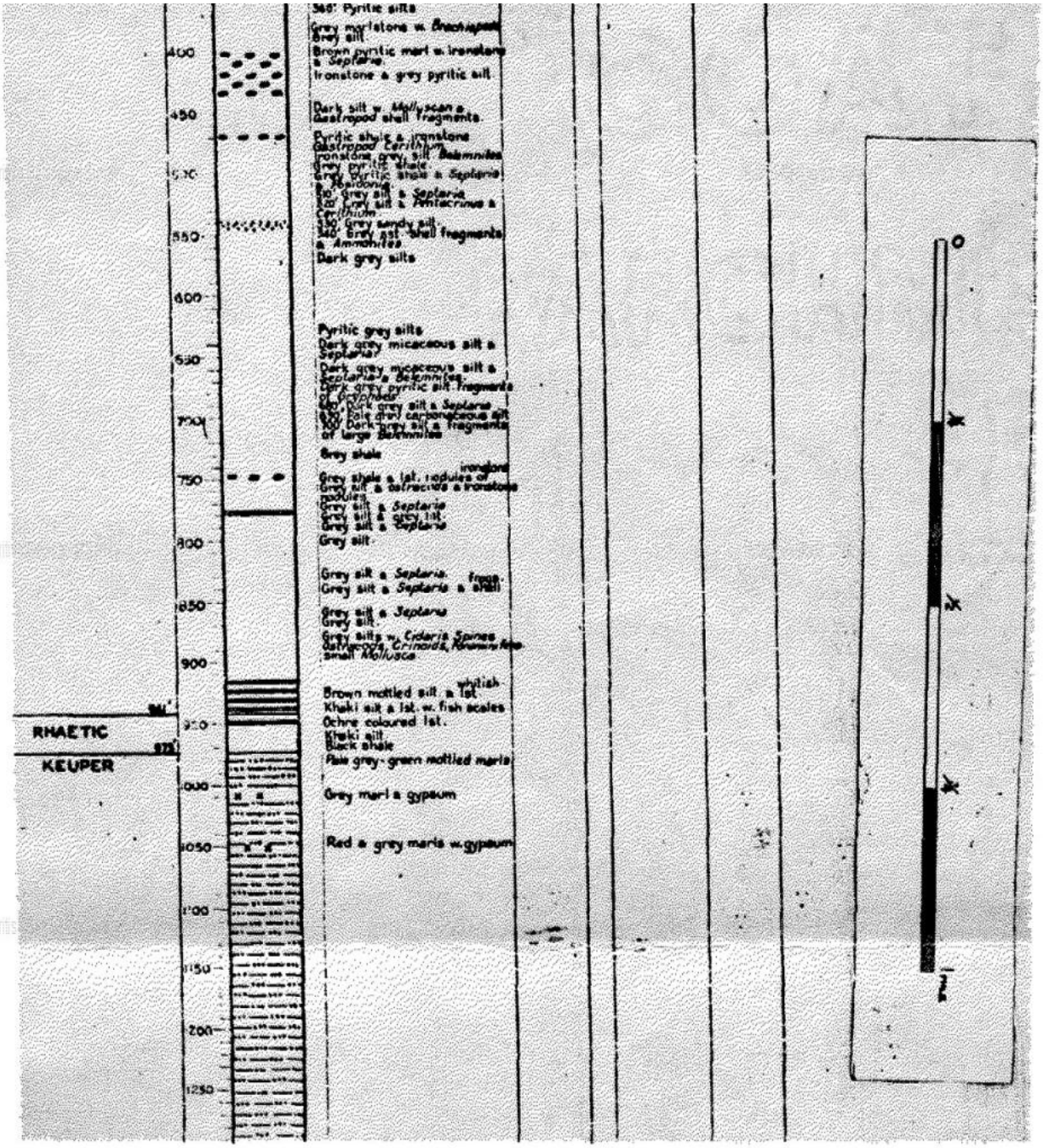
N.G.R. TF 0641 5970.

OD cc 80 & TF05NE/1

- LEGEND -

- SHALE CLAY, MARL OR MUDSTONE
- SANDY SHALE ETC.
- INTER-BEDDED SHALE ETC & SANDSTONE.
- CONGLOMERATE BRECCIA
- PEBBLY SANDSTONE
- SANDSTONE
- COAL
- FIRECLAY
- IRONSTONE
- CHERT OR FLINT
- ANHYDRITE, GYPSUM OR SALT
- LIMESTONE.
- DOLOMITIC LIMESTONE OR DOLOMITE ROCK.
- IGNEOUS ROCK.

GEOLOGICAL FORMATION	DEPTH IN FEET	LOG	DETAILS OF FORMATION	OIL, GAS WATER COAL SEAMS	CASING	DATE	REMARKS
LINCOLNSHIRE LST.						2.9.43	Commenced drilling 14¾" diam. hole.
	50		Cream coloured oolitic lst.				
			Cream oolitic lst.				
NORTHAMPTON SANDS	100		Calc. sandy flags. Lignite.				
UPPER LIAS			Grey coarse soft sst.				
			Grey silt				
	150		Soft grey shale w. pyritised foraminifera.				
	200		Grey shale		11¾" 221' Wooden Plug	3.9.43	Depth 221' Cemented 11¾" casing at 195' with a tons cement. No cement returns. 221' Changed diam. of hole to 8¾"
	250		Argillaceous lst. w. shale				
MIDDLE LIAS			Thin bedded grey silt.				
	300		Sandy lst. Marlstone Grey sst. Grey silt with pyrite Grey micaceous silt Grey-brown argillaceous lst & silt				
LOWER LIAS	350						

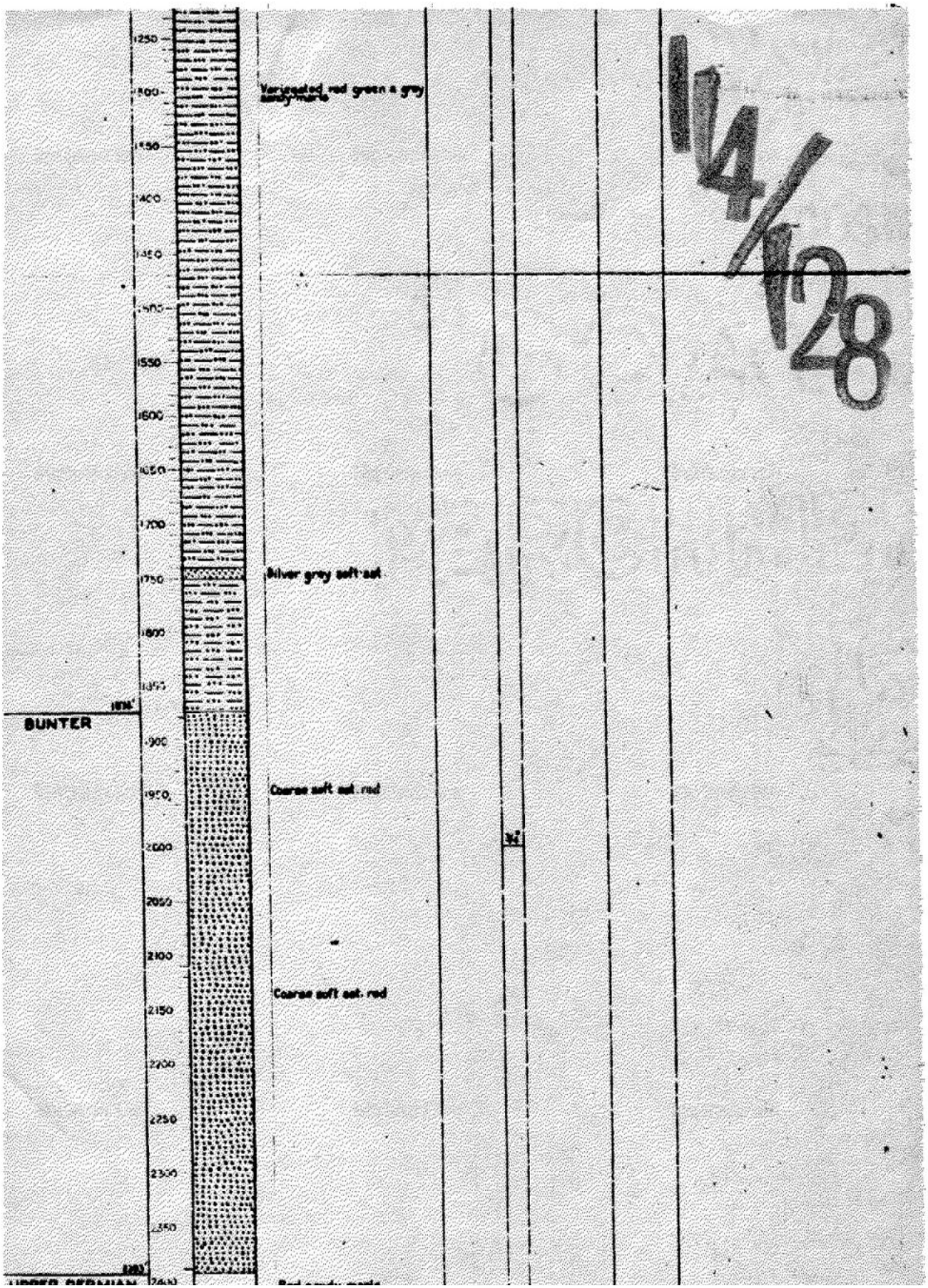

RHAETIC
KEUPER
400
450
500
550
600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
1250
Pyritic silts
Grey mudstone w. Brachiopods
Grey silt
Brown pyritic marl w. ironstone
a Septaria
Ironstone & grey pyritic silt
Dark silt w. Mollusc &
Gastropod shell fragments.
Pyritic shale & ironstone
Gastropod Cerithium
Ironstone, grey silt Belemnites
Grey pyritic shale
Grey pyritic shale & Septaria
& Pentacrinus
Grey silt & Septaria
Grey silt & Pentacrinus &
Cerithium
Grey sandy silt
Grey sst. shell fragments
& Ammonites
Dark grey silts
Pyritic grey silts
Dark grey micaceous silt &
Septaria?
Dark grey micaceous silt &
Septaria & Belemnites
Dark grey pyritic silt fragments
of Crinoids
Dark grey silt & Septaria
Pale grey carbonaceous silt
Dark grey silt & fragments
of large Belemnites
Grey shale
Grey shale & lst. nodules of
ironstone
Grey silt & calcareous ironstone
nodules
Grey silt & Septaria
Grey silt & grey lst.
Grey silt & Septaria
Grey silt
Grey silt & Septaria fragm.
Grey silt & Septaria & shell
Grey silt & Septaria
Grey silt.
Grey silts w. Cidaris Spines
Calcareous Crinoids, Foraminifera
Small Mollusca
Brown mottled silt & whitish
lst.
Khaki silt & lst. w. fish scales
Ochre coloured lst.
Khaki silt
Black shale
Pale grey-green mottled marls
Grey marl & gypsum
Red & grey marls w. gypsum

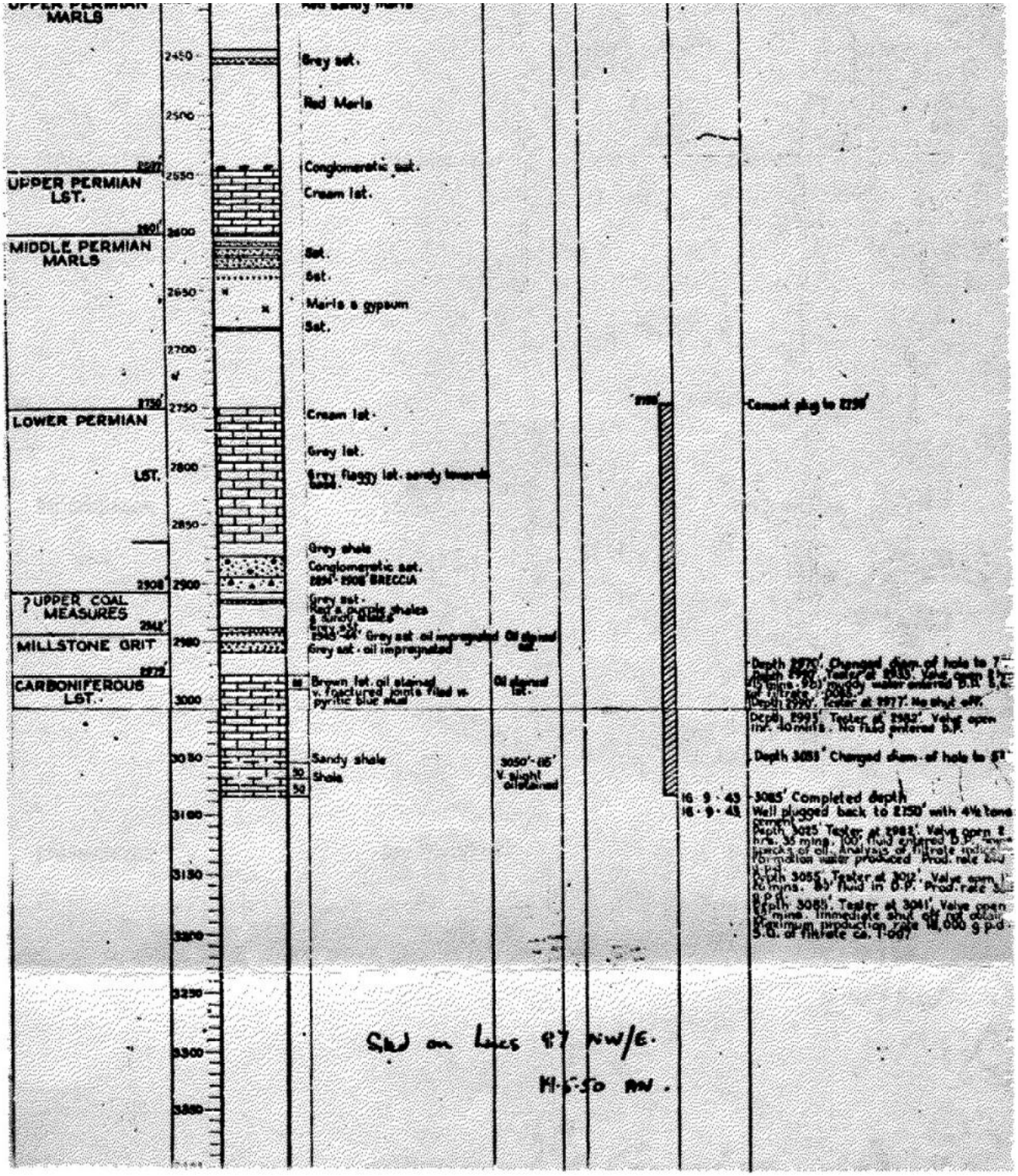
British Geological Survey

Version 2.0.6.6

BGS ID: 469003 : BGS Reference: TF05NE1
British National Grid (27700) : 506397,359695

[redacted]




MARLS
UPPER PERMIAN LST.
MIDDLE PERMIAN MARLS
LOWER PERMIAN
LST.
?UPPER COAL MEASURES
MILLSTONE GRIT
CARBONIFEROUS LST.
2450
2500
2550
2600
2650
2700
2750
2800
2850
2900
2950
3000
3050
3100
3150
3200
3250
3300
3350
Grey sst.
Red Marls
Conglomeratic sst.
Cream lst.
Sst.
Sst.
Marls & gypsum
Sst.
Cream lst.
Grey lst.
Grey flaggy lst. sandy towards base.
Grey shale
Conglomeratic sst.
2894'-2908' BRECCIA
Grey sst.
Red & purple shales & sandy shales
2943'-44' Grey sst. oil impregnated
Grey sst. oil impregnated
Oil stained sst.
Brown lst. oil stained v. fractured joints filled w. pyritic blue mud
Oil stained lst.
Sandy shale
Shale
3050'-65' V. slight oil stained
Cement plug to 2750'
Depth 2970' Changed diam. of hole to 7"
Depth 2993' Tester at 2983' Valve open inf. 40 mins. No flow entered D.P.
Depth 3081' Changed diam. of hole to 6"
16 · 9 · 43
16 · 9 · 43
3085' Completed depth
Well plugged back to 2750' with 4½ tons cement
Depth 3025' Tester at 3982' Valve open 2 hrs. 35 mins. 100' fluid entered D.P. traces of oil. Analysis of filtrate indicates formation water produced Prod. rate 2nd
Depth 3055' Tester at 302' Valve open 10 mins. 80' fluid in D.P. Prod. rate 3rd g.p.d.
Depth 3085' Tester at 3041' Valve open 30 mins. Immediate shut off no oil obtained. Maximum production rate 18,000 g.p.d. S.G. of filtrate ca. 1·007
Shd on Lacs 87 NW/E.
11·5·50 AN.

BGS ID: 469025 : BGS Reference: TF05NE16
British National Grid (27700) : 508334,358923

[redacted]

RECORD of ~~WELL or~~ BORING (Nos. 19–29)

Survey No.
1" N.S. 114
1" O.S.

Across the outcrop of the Lincolnshire Limestone, 9 miles S. of Lincoln.

Town, Village, &c. County Lincs Six-inch map

Exact site (unless a tracing from a map is supplied, give distance and direction from parish church, cross-roads, or other object shown on maps). Description of site made by G.W.D. from the (see Tracing) tracing and is on a 1" scale. Popular Edition (Sheet of one-inch map. (Square

Surface level of ground ft. above Ordnance Datum. Well or Bore commenced at ft. below surface level of ground.

Sunk ft., diameter ft. Bored ft.; diameter of boring at top 6 in., at bottom 6 in.

Details of lining tubes (internal diameters preferred)
All the bores were backfilled to take explosives (for the seismic method of geophysical survey)

Water struck at depths of (feet)

Rest-level of water below / above top of well or bore ft. Pumping level ft. Time of recovery hours.

Suction at ft. depth. Yield: (i) on test galls. per, (ii) normal galls. per

Quality

Made by [redacted] Date of boring Nov.-Dec. 1930

Informat

(For Survey use only).

THICKNESS. DEPTH.

TF05 NE/14 +15

No. 24 + 25 Records of 1" not received. No. 24 was 64 chains W.N.W of Scopwick church, & just N. of the Navenby Road. No. 25 was 26 chains N by E of Scopwick church and 26 chains E of the Blankney road at the turning to Navenby & Lincoln.

TF05 NE/16

No. 26. Scopwick parish; on the boundary, 78 chains E.N.E of Scopwick church and about 9 chains W.S.W of "Scopwick Lodge Fm." [another near Scopwick Lodge & bore 23]. O.D. [just below 50' contour] say 49'. No water met with

	Metres		Metres
Mould	0. 5		
Soil & stones	6	—	60
Limestone	3	1	90·53
Marled clay	52	6	92·06
Clay	61	8	92·67
Hard sandy clay	316	45	14·63
	66	60	18·29

Conbrash

"Bore is in Conbrash over Upper Lst. ? Lower is Ab-Oolite Lst"

TF05NE17 MARTIN PARISH BORE NO. 27 TF 09541 58809

TF05 NE/17

No. 27. Martin parish, on the Timberland boundary. 8 chains E of the railway and 37 chains N. by E of bridge (& level crossing ?) at Scopwick Station O.D. (just below 25' contour) say 24'. Rest-water-level 3 ft. down.

Top soil	1 —	1	—
Marled clay	39 8 9	40	12·19
Blue sandy clay	20 6·10	60	18·21

"? Kellaway under B. Clay. [If so] Chr. is here −35' [or less], but if as in + 47' O.D. in No. 26 — giving dip of 83' per 3/4 mile = 112 ft. per mile."

British Geological Survey

Version 2.0.6.6

BGS ID: 469025 : BGS Reference: TF05NE16
British National Grid (27700) : 508334,358923

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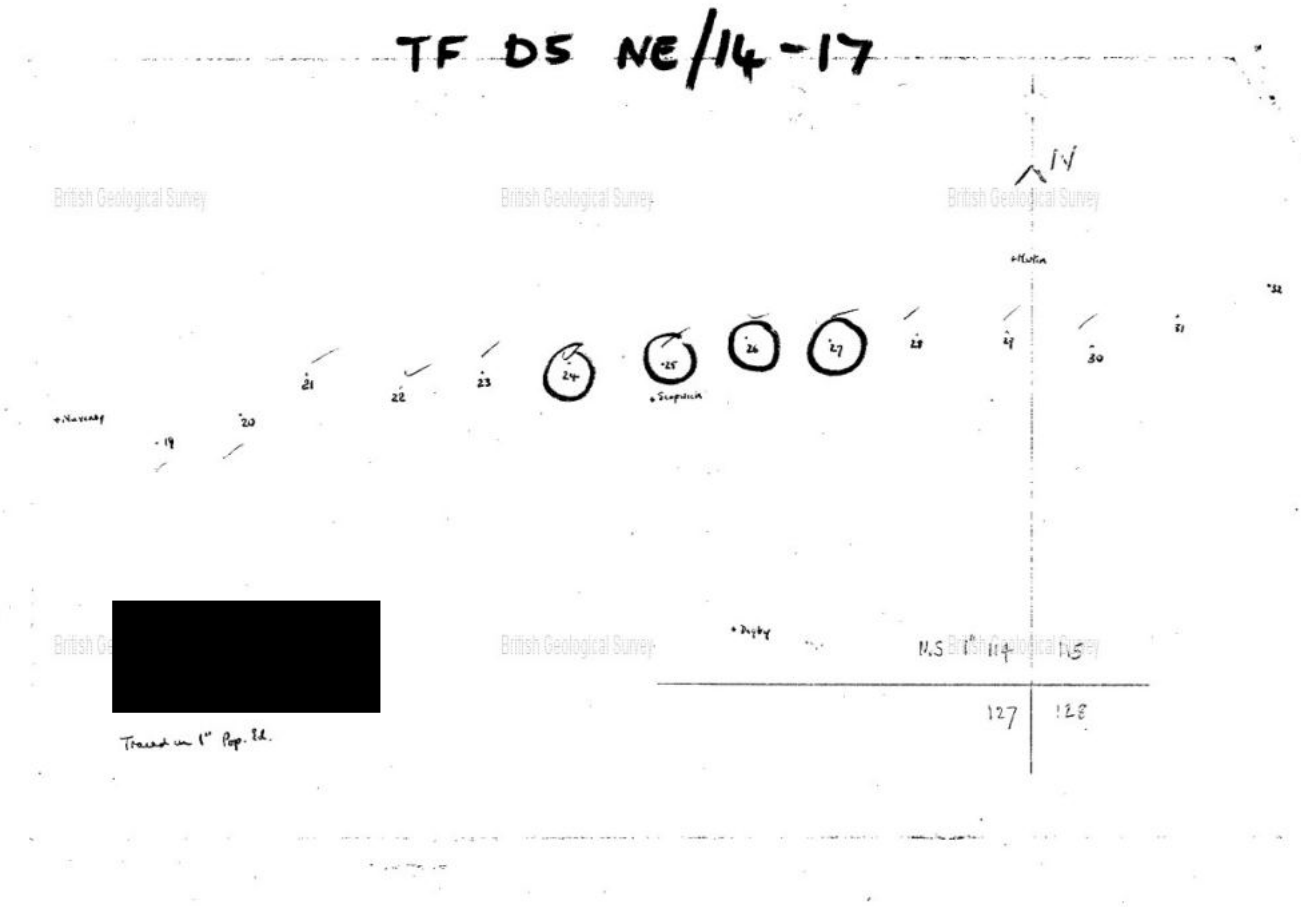


APPENDIX E10 BGS BOREHOLE LOGS – ZONE M

TF16SW21 LINWOOD GRANGE TF 10190 60220

Surface level (+ 18.1 m) +59 ft
Water struck at +16.6 m
March 1979

Overburden 0.7 m
Mineral 2.8 m
Waste 13.8 m
Bedrock 1.2 m+

LOG

Geological classification	Lithology	Thickness m	Depth m
	Soil	0.7	0.7
Fluvio-glacial and Older River Sand and Gravel	Pebbly sand, 'clayey' to 1.5 m Gravel: fine with coarse, subrounded quartzite with sub-rounded limestone, rounded quartz, subangular flint and subrounded sandstone Sand: medium, quartz with lithic grains	2.8	3.5
Till	Clay, silty, chiefly olive grey with reddish brown patches at 16 m; pebbles of chalk, flint and mudstone (common to base)	13.8	17.3
Ancholme Clay Group	Silt, clayey, dark greenish grey, laminated in part, fossiliferous	1.2+	18.5

GRADING

Mean for deposit percentages			Depth below surface (m)	Percentages						
				Fines	Sand			Gravel		
Fines	Sand	Gravel		$-\frac{1}{16}$	$+\frac{1}{16}-\frac{1}{4}$	$+\frac{1}{4}-1$	+1 -4	+4 -16	+16 -64	+64 mm
6	75	19	0.7-1.5	14	19	51	4	8	4	0
			1.5-3.5	2	9	59	7	14	9	0
			Mean	**6**	**12**	**57**	**6**	**12**	**7**	**0**

COMPOSITION

Depth below surface (m)	Percentages by weight in +8 -16 mm fraction								
	Flint	Quartzite	Limestone	Quartz	Sandstone	Mudstone	Ironstone	Igneous	Others
0.7-1.5	9	55	0	17	19	0	0	0	0
1.5-3.5	10	44	20	17	7	0	0	2	0
Mean	**10**	**46**	**16**	**17**	**9**	**0**	**0**	**2**	**0**

TF05SE/20

DRILLING & GEOSERVICES SEPT. 1972.

127/218 A

TF 0653/31

Blackholm Exploratory (Hole C.E.)

(TF 06355311) TF05SE

G/L 22.79 maod Flange 22.54 maod

MAP OUTCROP - CORNBRASH

Core Description - J.A. Dickson

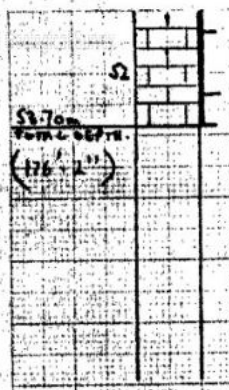
m BGL	Core	Description	Driller's Log	
2			stiff brown clay + Bldr.	TOPSOIL + CORNBRASH
4			grey sand rock	BLISWORTH CLAY
6				
8				
10			light grey sand rock	GT OOLITE LIMEST.
12				
14			lt. grey sand rock	
16				
18	4½ core 1.5	extrem-rich SHALY LIMESTONE then bioturbated sandy clayey LIMESTONE, few shells.	grey sandy rock	UPPER ESTUARINE
20			dark grey stiff Clay	
22				
24	4½ core	grey oosparite LIMESTONE, some shells, hard	Lincoln. Limestone	LINCS. LIMESTONE
26	rec 2.50	brown crumbly oolite LIMESTONE		
26.0m		grey crumbly OOLITE LIMESTONE		
28	3.70	grey and brown bands oosparite; cross bedded, friable and hard bands.		
		mainly grey fine grained LIMESTONE, scatt'd ooids, shal. debris		
		brown and grey oomicrite, calcite-filled cavities, nerinea, trigonia, shells, sol. pebbles, bec. fn grained LIMESTONE.		
30		grey oolite, buff pebbles w/ dark skins.		
	3.00	grey oomicrite and lime mudstone, calc. shale band, bec. coated grains in L.mdst, then eod. boundmage paler areas w/ skeletal debris and black clay between brown L/m at base.		
32		banded grey oosparite and oomicrite.		
		grey lime mudstone, soft w/ scatt'd ooids.		
34	2.00	grey crumbly oomicrite LIMESTONE		
		with clayey base.		
36		grey shelly oomicrite then sandy lime mudstone.		
		lime mudstone with ooids.		
	2.00	grey oomicrite, clayey at top.		
		grey lime mudstone w/ scatt'd oolithe,		
38		darker at base, more organic.		
		oomicrite and lime mudstone, squashed white bivalves.		
		grey hard oomicrite, then lime mudstone, large shells and	Limestone	
40		bands, patches of oomicrite, clayey streaks.	and bands	
	2.00	pl grey lime mdst, + oomicrite, mud patches.	of Clay	
		mainly grey lime Mudstone, mud patches, clayey in pts,		
		scattered wht skeletal debris + squashed ooids at base.		
42		shale.		
		grey CALCITE MUDSTONE, fine skeletal debris + chondrites;		
	2.00	calcite mudst and few ooids;		
		pebble + skeletal layer in lime mudstone at base.		
44		then brown band		
		grey close-packed oomicrite LIMESTONE,		
		clayey at bottom.		
46	2.00	grey and brown (interlocked) oomicrite LIMESTONE,		
		clayey-lime mudstone at base.		
48		grey patchy oomicrite and lime mudstone, bioturbated, scattered ooids.		
	2.00	Black shale at base		

Rec'd from A.W.A 17.5.79. Sited by © on 1" site map + on 6" Nat Grid Sheet.

TF05SE/20

127/218 A TF 0653/31

Borehole Exploratory



Q2

53.70m from OSPTB. (176' 2")

grey Lime mudstone, coal bearing, clayey seams, scattered oolite and shells.

Limb + bands of Clay

LIME CLAY.

OR ESTUARINE?

Drilled by DRILLING & GEOSERVICES

2/9/1972 - 12/9/1972

W/L 12/11/1972 ... 7.5m.

9 boxes cores at Appleby core store

DICKSON.

BLOCKHOLM (CGD).

TF 06538

m.					
2			CLAY		STIFF BROWN, W/ BOULDERS.
4					
6		DRILLERS LOG.	GREY SANDY ROCK		
8					
10					
12			LT GREY SAND ROCK		
14					
16			A/A		
18			LIMESTONE		OSTREA-RICH, SHALY, DEC BIOMICRITATED CLAYEY.
20		NO CORE	DARK GREY STIFF CLAY.		
SCALE CHANGE m 24					
		24.5		TOP LMT.	
25			OOLITIC LIMESTONES	LINCS. LIMESTONE	HARD OOSPARRITE, SOME SHELLS, GREY AT TOP THEN BROWN.
26					CRUMBLY OOLITE, BROWN THEN GREY,
27					FRIABLE/HARD OOSPAR, BROWN/GREY BANDS.
28			FG LIMESTONES + OOMICRITE		SCATT OOIDS, WHT SKELETAL DEBRIS;
29					GREY W/ BROWN BANDS, DEC SHELLY.
30			LIMESTONE		OOLITIC PELOIDAL; GRANULAR; OOMIC;
31					LIME MUDSTONE; SOME BOUDINAGE;
32					BANDED OOSPARITE, X-BEDDED OOMICRITE.
33			LIME MUDST.		MAINLY GREY, BROWN BAND.
34			CRUMBLY OOMICRITE.		SOFT, SCATTERED OOIDS.
35					GREY.
36			LIME MDST.		CLAYEY BASE.
37			OOMICRITE + LIME MDST.		SANDY; GREY; PRED HARD, MICACEOUS.
38					GREY; SHALY IN PTS; SCATT OOLS IN
39			LIME MDST A/A		LIME MUD; DEC DKR, SHELLY, HARD.
40			OOMICRITE + LIME MUDST.		[SOME LARGE BIVALVES. IN NEXT]
41					W/ OOIDS. SHELLY. GREY.
42			SHALE		BOUDINAGE; SHALE CLAYEY PARTS; BROWN
43			CALCITE MUDSTONE		PALE GREY, MUD PATCHES,
44					SCATT SHELLS + SQUASHED OOIDS AT BASE.
45			OOMICRITE		GREY, BROWN AT BASE.
46					CHONDRITES + SKELETAL DEBRIS. FEW OOIDS.
47			OOMICRITE		PISOLITIC LAYER.
48					CLOSE PACKED, BROWN AT TOP THEN ALL GREY,
49			OOMICRITE + LIME MUDST.		DEC MUDDY IN PATCHES.
50					BROWN+ GREY PATCHY; CRUMBLY IN PTS,
51			LIME MUDST.		CLAYEY TOWARDS BASE.
		50.7 END CORE			PATCHY, BIOTURB, SCATT OOIDS.
					BLACK SHALE BASE.
					SED. BOUDINAGE; CLAY SEAMS; SCAT OOIDS + SHELLS

Additional information

Bloxham 127/218 (b)

AWA production site

Information from AWA Sept. 1981

At the time that Ashby P.S. 114/99 (b + c) was producing waters of a nitrate content of c. 15 mg/l, the water produced at Bloxham was 3–4 mg/l lower. (? 1976) However, the yield at Bloxham was found to be inadequate.

[redacted] Sept. 1981

SP43NW

See also JNV's log. GRID REF. TF 05331 ~~TF05SE/27~~ TF05SE/20

GROUNDWATER NITRATE POLLUTION RESEARCH BOREHOLE BLOXHOLM - AWA IGS

SAMPLE (AERE, AWA, Moist, PH PH)	DEPTH	DATE & TIME	EXCORREC.	LITHOSTRAT.	GRAPHIC LOG	COLOUR	DESCRIPTIVE LOG	COMMENTS
	25					Grey	Fine grained impure limestone with large shells - c. 3cm diam. Hard & well cemented	
	26						Oolitic limestones with spary cement. Occasional shells. Ooliths even medium size & constitute 95% of limestone. Well cemented & hard.	
	27					Buff	oxidised portion either side of fissure.	Major fissure
						Grey	Oolitic limestones as above — towards base ooliths ↓ & shell % ↑	Buff edges to fissure
	28					Buff		
						Grey	Impure shelly limestones with minor oolith content in patches. Well cemented with spary calcite. Blue hearted with buff oxidised portion near fissures. Shell fragments up to 1cm	
						Buff		
	29					Grey	Oolitic limestones with many shell fragments up to 10%. Spary cemented and hard. Ooliths ↓ & shell % ↑ near base.	
							Fine grained impure shelly limestones - in places whole small branch shells up to 3cm diam. Spary cement. Becoming oolitic towards base.	
	30							

GROUNDWATER NITRATE POLLUTION RESEARCH

BOREHOLE BLOXHOLM – AWA

IGS

SAMPLE (AERE, AVA, Moist, PH PR)	DEPTH	DATE & TIME	CORE REC.	FRACTURE	GRAPHIC LOG	COLOUR	DESCRIPTIVE LOG	COMMENTS
	30					mid grey	laminated clay band with small shell fragments	
						Light grey (with rusty buff patches)	Impure shelly limestone (minor oolith content at top) with micrite matrix but spary calcite cement. Often large whole shells set in skeletal debris. Hard & well cemented.	
	31							
	32					Buff		
						Light grey	Oolitic limestones with spary cement. In patches v. silty. Minor shell component. Ooliths banded in fining upward sequence in places.	
	33							
							Fine grained impure soft limestone. Occasional oolith	
							Friable oolitic limestone with spary calcite cement. Banded in fining upward sequences - marly parting in parts	
						Buff		
	34					Grey		
	35							
						mid grey	laminated clay seam with shell fragments	
						grey	Oolitic limestone with intraclasts	
						mid grey	clay seams with shell fragments - flaggy	
							Oolitic limestone with spary cement & in patches much silt. Occasional shell (rip-ups)	
	36							

GROUNDWATER POLLUTION NITRATE RESEARCH BOREHOLE Bloxham AWA IGS

SAMPLE (AERE, AWA, Moist, PH PR)	DEPTH	DATE & TIME	CORE REC.	FRACTURE	GRAPHIC LOG	COLOUR	DESCRIPTIVE LOG	COMMENTS
	36					grey	Oolitic limestones with Sparry cement for most part. In patches v. impure with silt up to 40%. Some parts rich in skeletal debris and large whole lamellibranch + gastropod shells (up to c. 4cm) Vugs filled with sparry calcite crystals	
	37						Impure fine grained limestones with occasional scattered ooliths + some shell debris. Hard + well cemented	
	38						Impure fine grained lmst with abundant shell debris. Minor oolith % which increases towards base. Hard + cemented with spar	
	39					dark grey	laminated clay seam with much shell debris on laminae + scattered ooliths. Micaceous	
						grey	Fine grained limestone with scattered black ooliths (50%)	
	40						Fine grained porcellanous lmst with shell fragments. Thin marl seam with shell debris. Fine grained lmst + shells	
						dk grey	laminated marl seam with shell debris	
						grey	Impure fine grained limestone with scattered ooliths. V. hard. No shells	
	41						Very impure limestone Fine grained and laminated much shell debris aligned along laminae. Squashed ooliths minor %	
						dk grey	laminated clay seam with shell debris	
	42						v. fine grained porcellaneous lmst with occasional ooliths (<1%)	

GROUNDWATER NITRATE POLLUTION RESEARCH

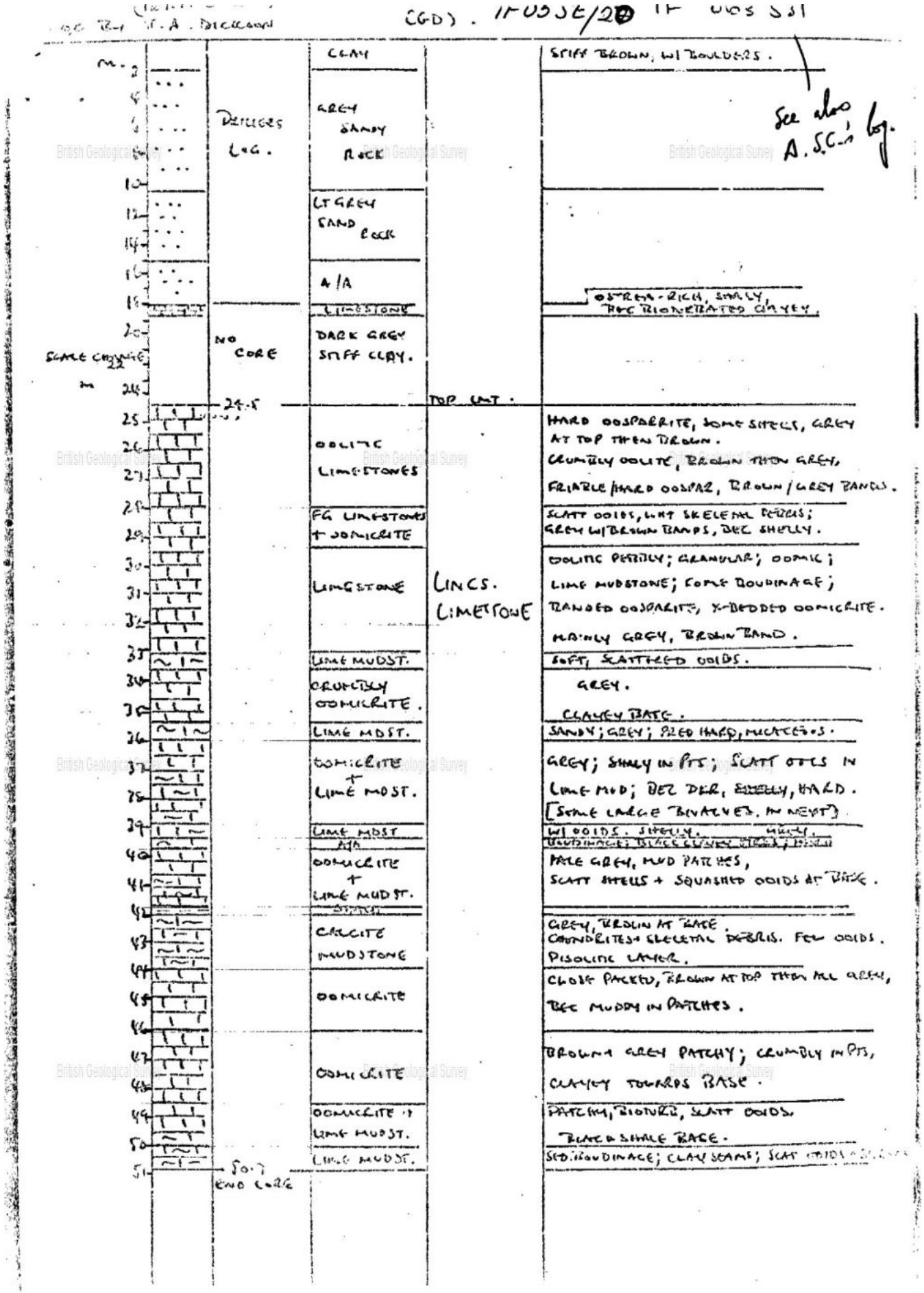
BOREHOLE BLOXHOLM – AWA

IGS

SAMPLE (AERE / AWA / Mast / PH PR)	DEPTH	DATE & TIME	CORREC.	FRACTURE	GRAPHIC LOG	COLOUR	DESCRIPTIVE LOG	COMMENTS
	42						V. fineg. porcellanous lst as above	
						Grey		
							Fine grained limestone with scattered oöliths (10%) Clay pellets & reworked lst.	
	43							
							Fine grained impure limestones with laminated bands of shell fragments (2-3cm)	
						Buff	marly packing	
						Grey	Oolitic limestone with hard spary cement. Silty matrix in patches	
	44							
							large shell 6cm replaced & infilled with calcite crystals.	
	45							
							shell fragments become more abundant in oolitic lmst.	
						mottled buff/grey		
						grey		
	46					mid grey / buff	very coarse crumbly oolite with muddy matrix and mud pellets	
						Buff	occasional shell fragments in med. sized oolitic lmst	
						Grey	with spary cement hard limestone	
						Buff		
	47						crumbly oolite with vugs	
						Grey		
							Hard oolitic limestone with much clay in matrix	
						Buff		
	48							

GROUNDWATER POLLUTION NITRATE RESEARCH BOREHOLE BLOXHOLM - AWA IGS

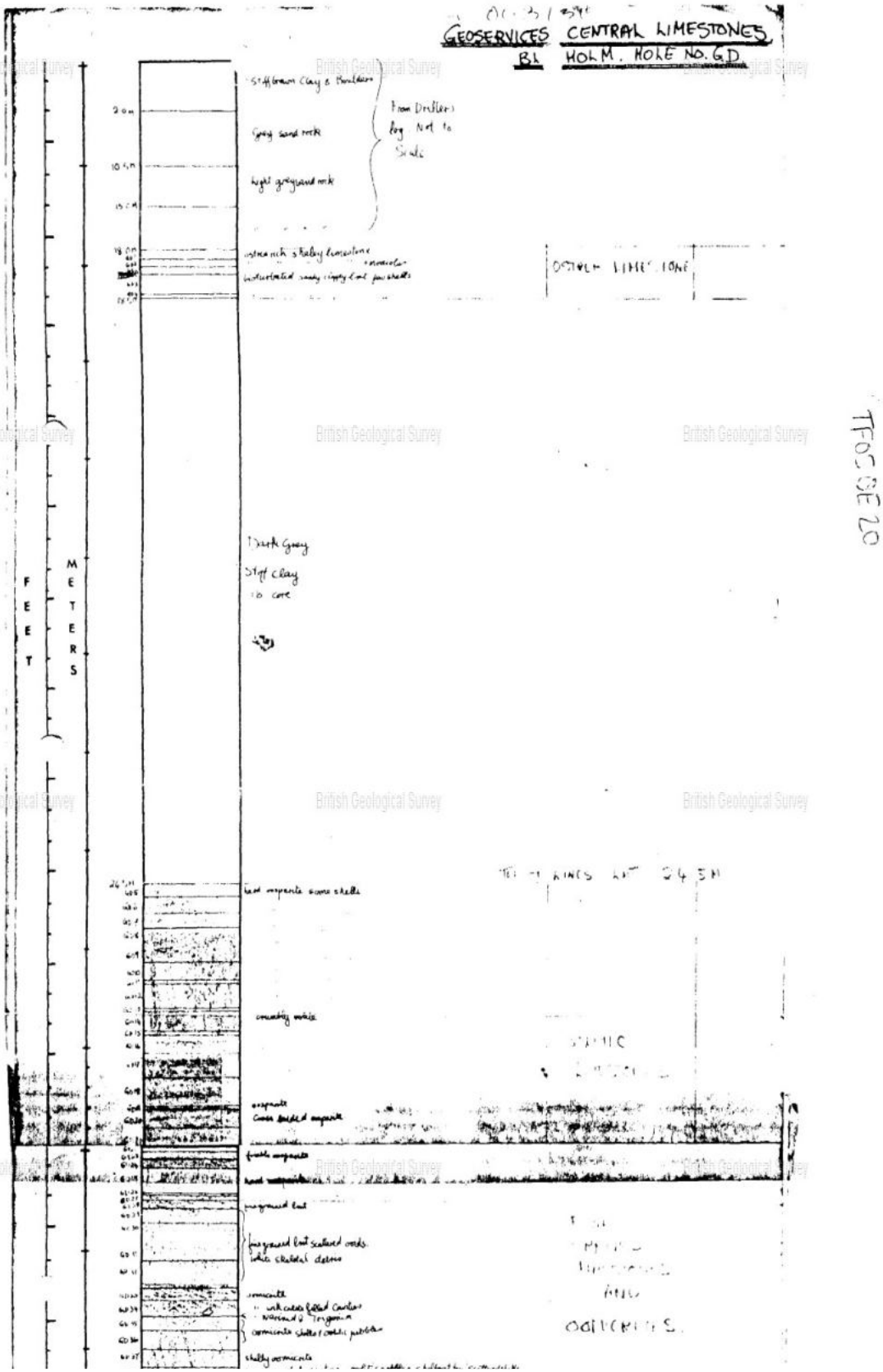
SAMPLE (AERE / AWA / Moist / PH PR)	DEPTH	DATE & TIME	CORE REC.	FRACTURE	GRAPHIC LOG	COLOUR	DESCRIPTIVE LOG	COMMENTS
	48					Buff	Oolitic limestone with fine grained matrix Hard & well cemented (sparry) Calcite infilled horizontal Vein (1cm diam) Major vertical fracture with Ferruginous deposit on walls Minor shell fragment component in patches	
						Grey		
						Buff		
	49						shelly clay rich band limestone.	
						Grey	Fine grained limestone with scattered oolths and approx 5% shell debris Hard & well cemented	
	50					Grey	clay rich band with shell fragments	
						Lt Grey	Fine grained impure limestone with scattered oolths. Marly partings at top. Minor shell debris component	
	51							

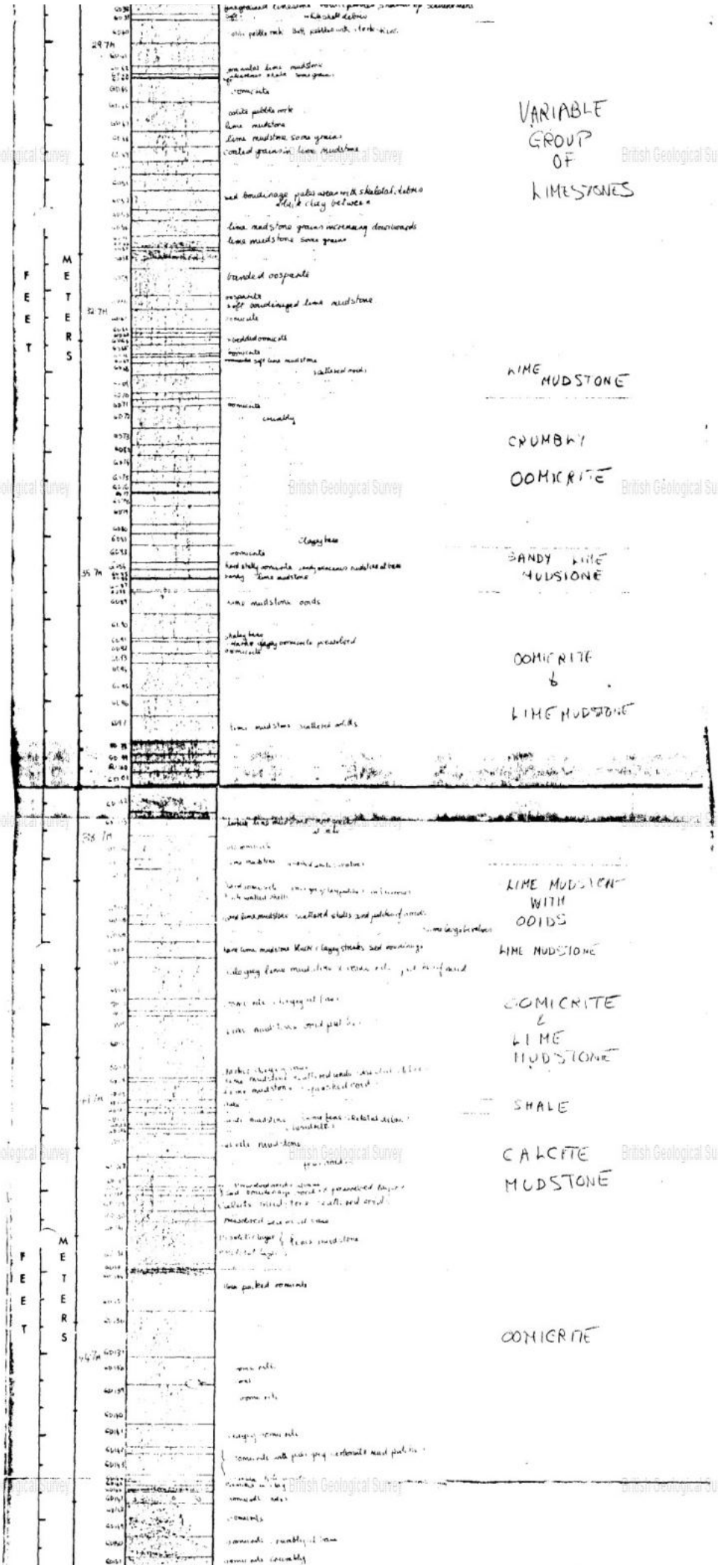

(GD). TF05SE/20
CLAY
STIFF BROWN, W/ BOULDERS.
See also A.S.C.'s log.
GREY SANDY ROCK
DRILLERS LOG.
LT GREY SAND ROCK
A/A
LIMESTONE
OSTREA-RICH, SHELLY, DEC BIOMICRITED GRAVEL.
NO CORE
DARK GREY STIFF CLAY.
SCALE CHANGE
TOP LNT.
24.5
ODLITIC LIMESTONES
HARD OOSPARRITE, SOME SHELLS, GREY AT TOP THEN BROWN.
CRUMBLY OOLITE, BROWN THEN GREY,
FRIABLE/HARD OOSPAR, BROWN/GREY BANDS.
FG LIMESTONE + OOMICRITE
SCATT OOIDS, LNT SKELETAL DEBRIS; GREY W/BROWN BANDS, DEC SHELLY.
LIMESTONE
LINCS. LIMESTONE
OOLITIC PELOIDAL; GRANULAR; OOMIC; LIME MUDSTONE; SOME BOUDINAGE; BANDED OOSPARITE, X-BEDDED OOMICRITE.
MAINLY GREY, BROWN BAND.
LIME MUDST.
SOFT, SCATTERED OOIDS.
CRUMBLY OOMICRITE.
GREY.
CLAYEY BASE.
LIME MDST.
SANDY; GREY; RED HARD, MICACEOUS.
OOMICRITE + LIME MDST.
GREY; SHELLY IN PITS; SCATT OOLS IN LIME MUD; DEC DEF, SHELLY, HARD.
[SOME LARGE BIVALVES IN NEXT]
LIME MDST
W/ OOIDS. SHELLY.
BOUDINAGE; BLACK CLAYEY SEAM; BROWN
OOMICRITE + LIME MUDST.
PALE GREY, MUD PATCHES, SCATT SHELLS + SQUASHED OOIDS AT BASE.
CALCITE MUDSTONE
GREY, BROWN AT BASE. CHONDRITES+ SKELETAL DEBRIS. FEW OOIDS. PISOLITIC LAYER.
OOMICRITE
CLOSE PACKED, BROWN AT TOP THEN ALL GREY, DEC MUDDY IN PATCHES.
OOMICRITE
BROWN+ GREY PATCHY; CRUMBLY IN PITS, CLAYEY TOWARDS BASE.
OOMICRITE + LIME MUDST.
PATCHY, BIOTURB, SCATT OOIDS.
BLACK SHALE BASE.
LIME MUDST.
50.7
END CORE
SED. BOUDINAGE; CLAY SEAMS; SCATT

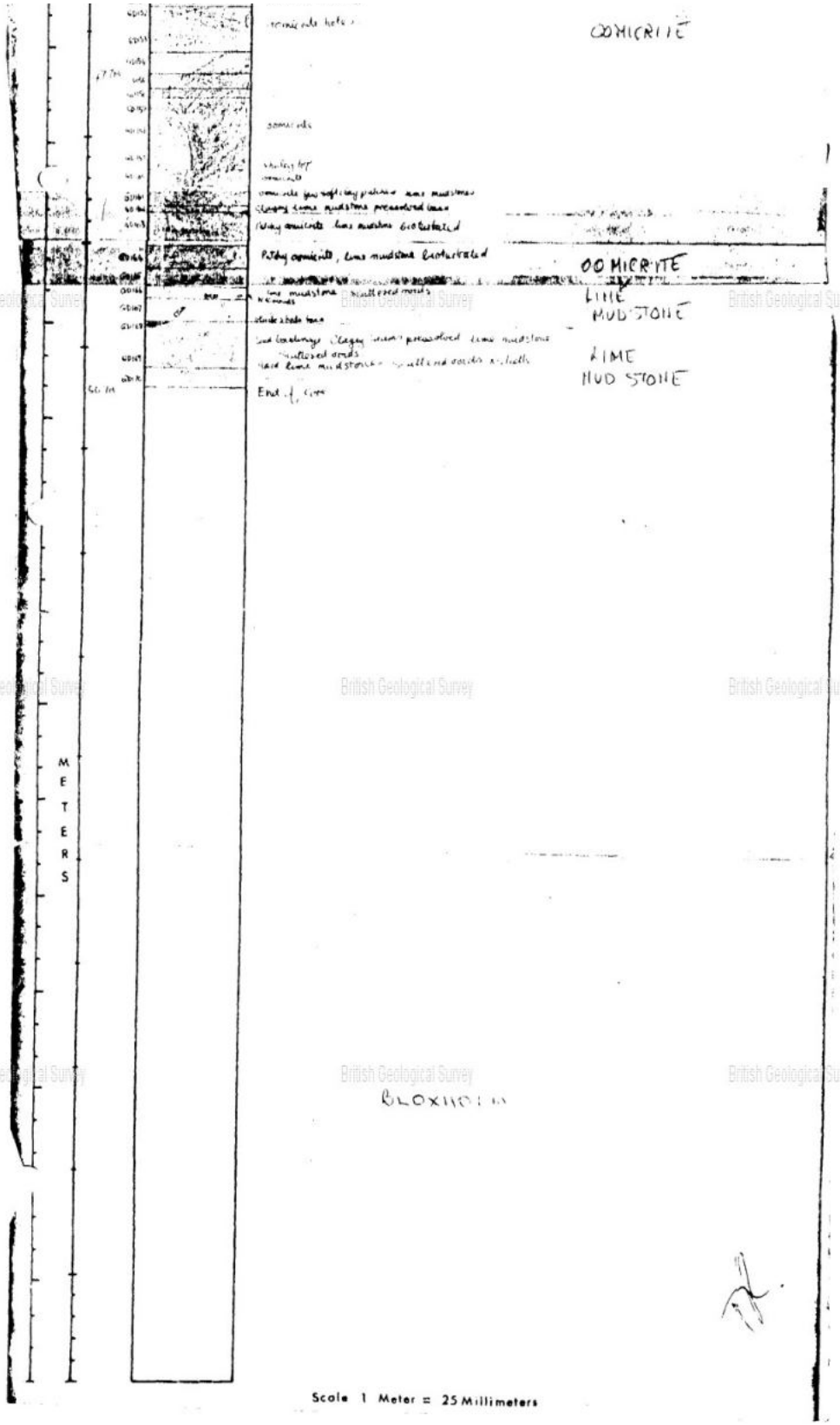
British Geological Survey

Version 2.0.6.6

BGS ID: 469137 : BGS Reference: TF05SE20
British National Grid (27700) : 506352,353112
[redacted]




FEET
METERS
29.7m
82.7m
95.7m
98.1m
VARIABLE GROUP OF LIMESTONES
LIME MUDSTONE
CRUMBLY OOMICRITE
SANDY LIME MUDSTONE
OOMICRITE & LIME MUDSTONE
LIME MUDSTONE WITH OOIDS
LIME MUDSTONE
OOMICRITE & LIME MUDSTONE
SHALE
CALCITE MUDSTONE
OOMICRITE



RECORD of ~~WELL or~~ BORING (Nos. 19–29)

Survey No.
1" N.S. 114
1" O.S.

Across the outcrop of the Lincolnshire Limestone, 9 miles S. of Lincoln.

Town, Village, &c. County Lincs Six-inch map

Exact site (unless a tracing from a map is supplied, give distance and direction from parish church, cross-roads, or other object shown on maps). Description of site made by G.W.D. from the (see Tracing) tracing and is on a 1" scale. Popular Edition (Sheet of one-inch map. (Square

Surface level of ground ft. above Ordnance Datum. Well or Bore commenced at ft. below surface level of ground.

Sunk ft., diameter ft. Bored ft.; diameter of boring at top 6 in., at bottom 6 in.

Details of lining tubes (internal diameters preferred)
All the bores were bottled to take explosives (for the seismic method of geophysical survey)

Water struck at depths of (feet)

Rest-level of water below above top of well or bore ft. Pumping level ft. Time of recovery hours.

Suction at ft. depth. Yield: (i) on test galls. per, (ii) normal galls. per

Quality (attach copy of analysis if available)

Made by [redacted] Date of boring Nov.-Dec. 1930

Informa[redacted]

(For Survey use only).

	THICKNESS.	DEPTH.
TF05 NE/14 +15		

Nos. 24 + 25 Records of 1" not received. No. 24 was 64 chains W.N.W of Scopwick church, & just N. of the Navenby Road. No. 25 was 26 chains N by E of Scopwick church and 26 chains E of the Blankney road at the turning to Navenby & Lincoln.

TF05 NE/16

No. 26. Scopwick parish; on the boundary, 78 chains E.N.E of Scopwick church and about 9 chains W.S.W of "Scopwick Lodge Fm." [another near Scopwick Lodge & bore 23]. O.D. [just below 50' contour] say 49'. No water met with

	Metres	Metres
Mould	0 5	6 — 60
Soil & stones	1 3	1 90·53
Limestone	5 1 52	6 92·06
Mottled clay	20 6 1	8 92·67
Clay	39 11 3 16	45 14·63
Hard sandy clay	123 66	60 18·29

"Bore is a Combrash corf [cored] well. ? Base is Ab. Oolite Lst"

TF05NE17 MARTIN PARISH BORE NO. 27 TF 09541 58809

TF05 NE/17

No. 27. Martin parish, on the Timberland boundary. 8 chains E of the railway at Scopwick Station and 37 chains N. by E of bridge (& level crossing ?) O.D. (just below 25' contour) say 24'. Rest water-level 3 ft. down.

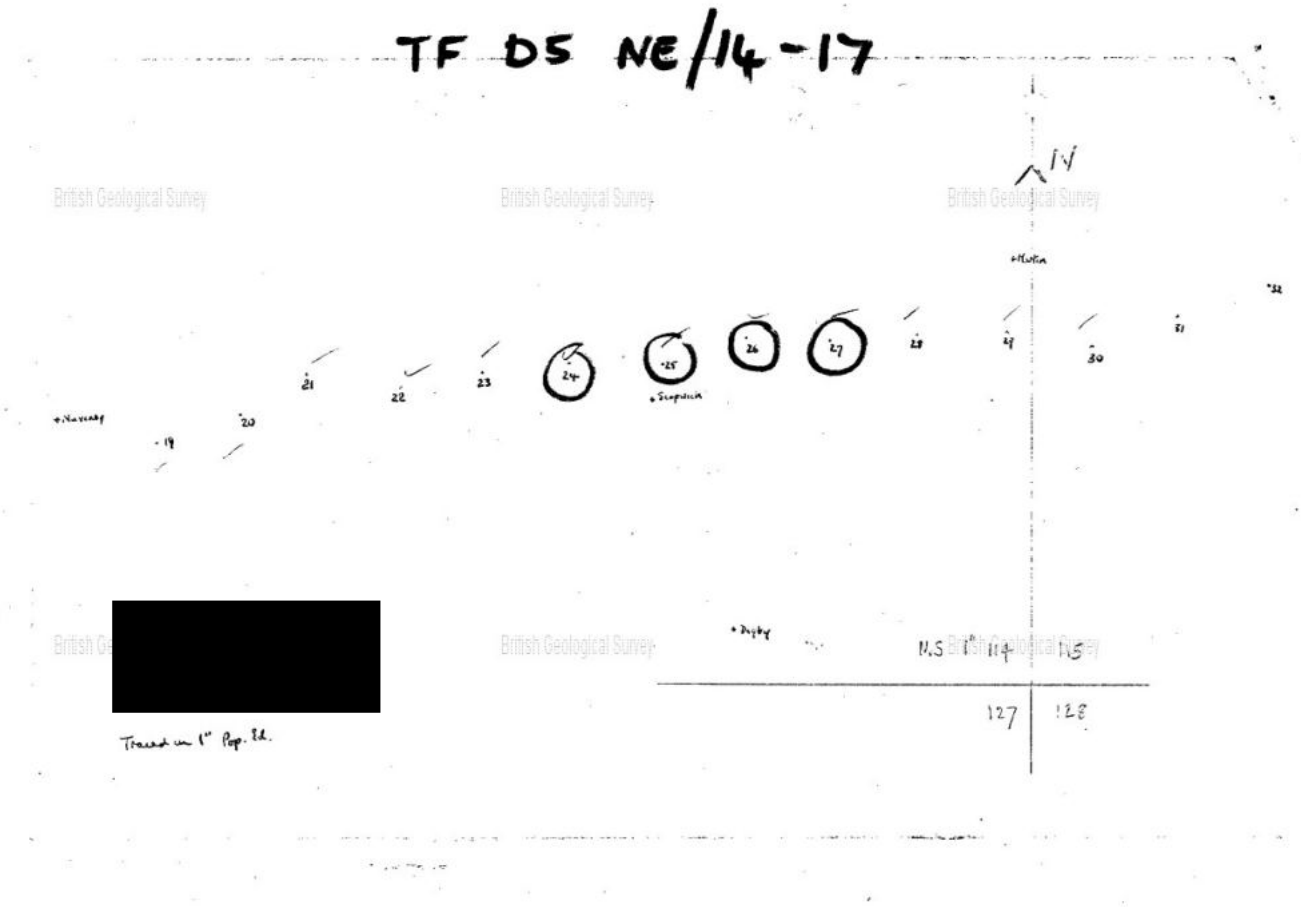
Top soil	1 —	1 —
Mottled clay	39 1 89	40 12·19
Blue sandy clay	20 6 10	60 18·21

"? Kellaways under B. Clay. [If so] Chr. is here −36' [or less], but if as in No. 26 — giving dip of 83' per ¾ mile = 112 ft. per mile."

British Geological Survey

Version 2.0.6.6

BGS ID: 469026 : BGS Reference: TF05NE17
British National Grid (27700) : 509541,358809
[redacted]

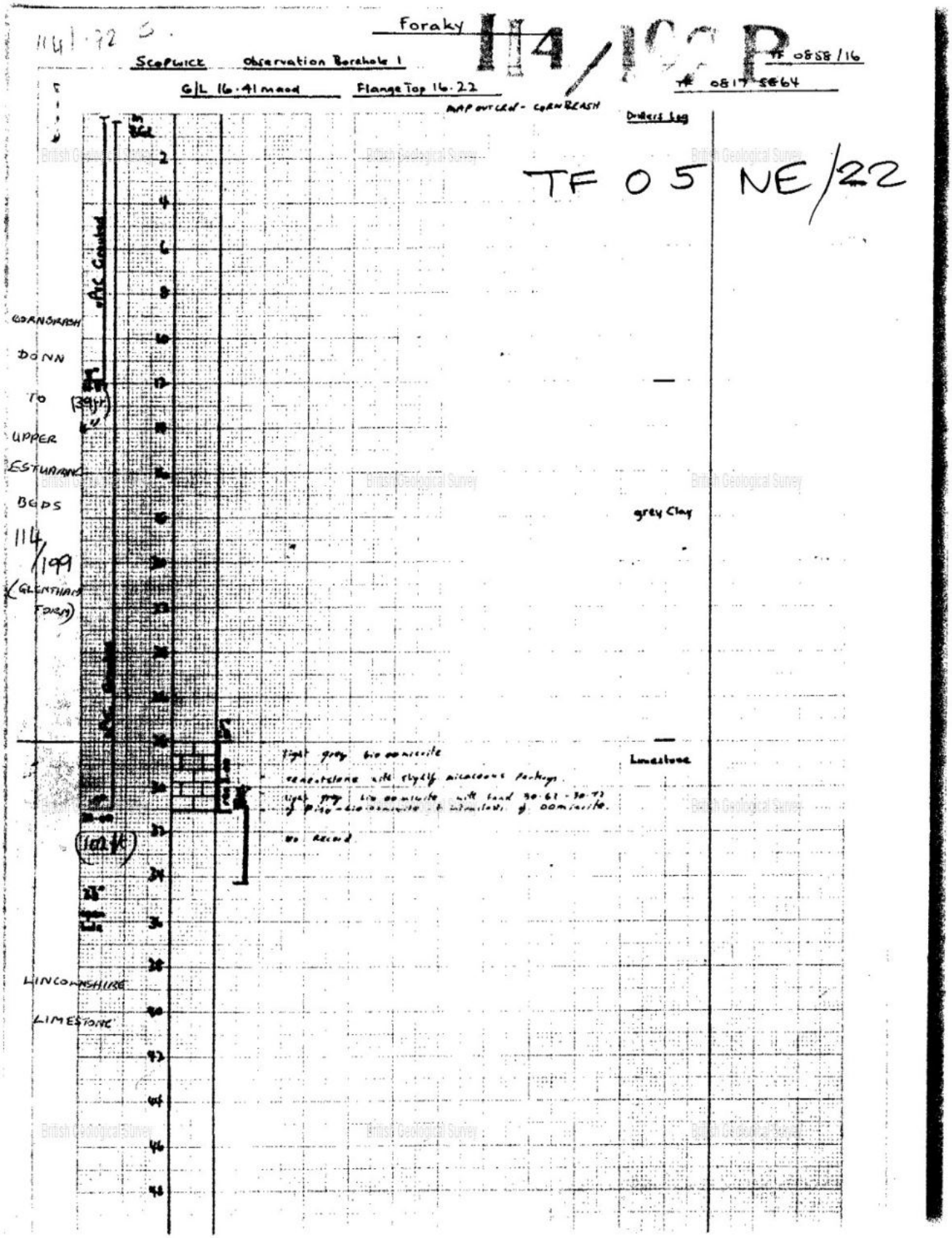


British Geological Survey

Version 2.0.6.6

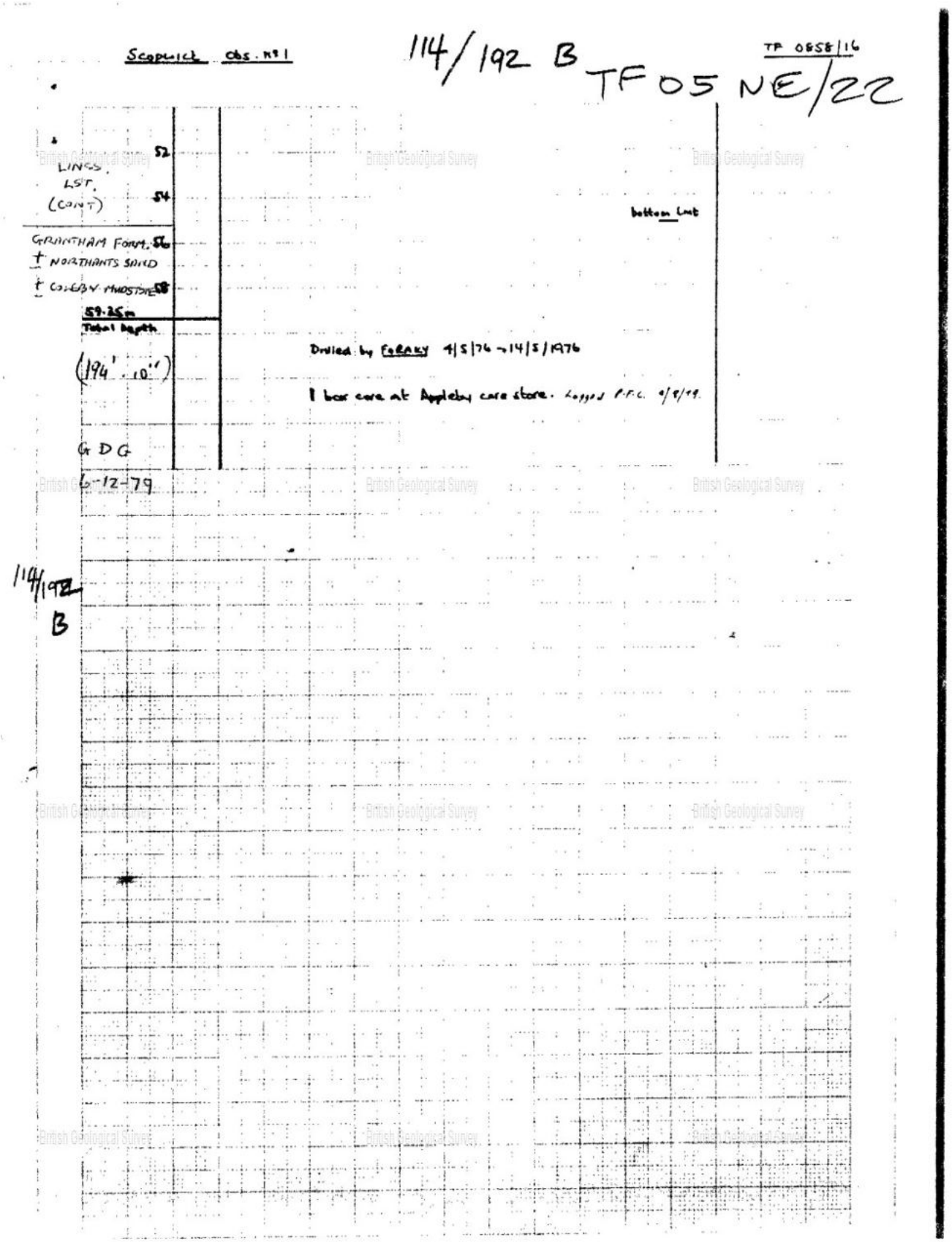
BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640

[redacted]



BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640

[redacted]



British Geological Survey

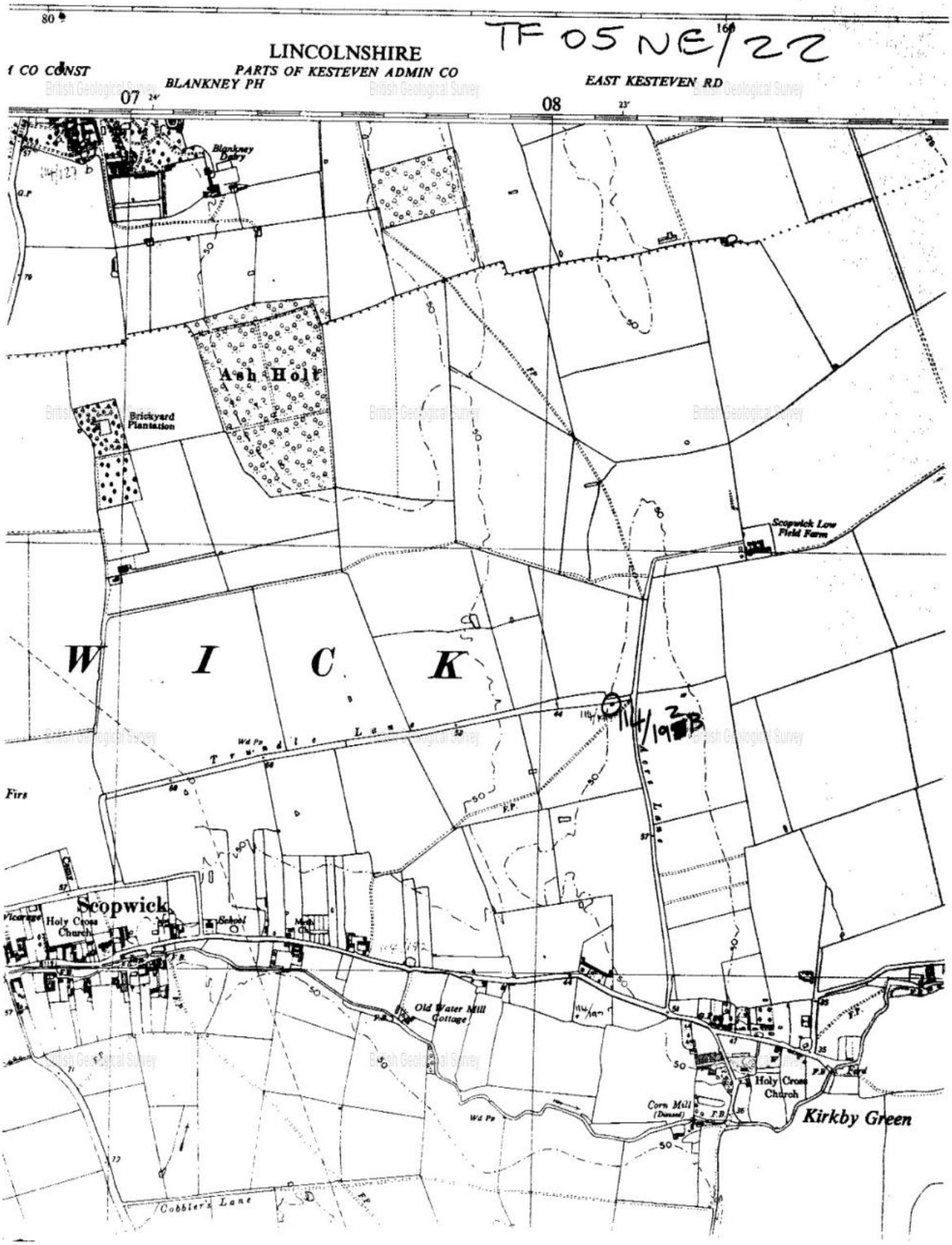
Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640
[redacted]

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

Provisional

TF 05 NE/22



British Geological Survey

Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640
[redacted]

TF05/45

TF 05 58/16

Scopwick obs. No 1

114/192 B

LINCOLNSHIRE LIMESTONE (CONT.) 52

54

bottom Unit

GRANTHAM FM + NORTHAMPTON SAND + COCKEBY MUDSTONE 56

58

59.25m Total depth

(194'.10")

Drilled by Foraky 4/5/76 - 14/5/1976

1 box core at Appleby core store. Logged P.F.C. 4/9/79

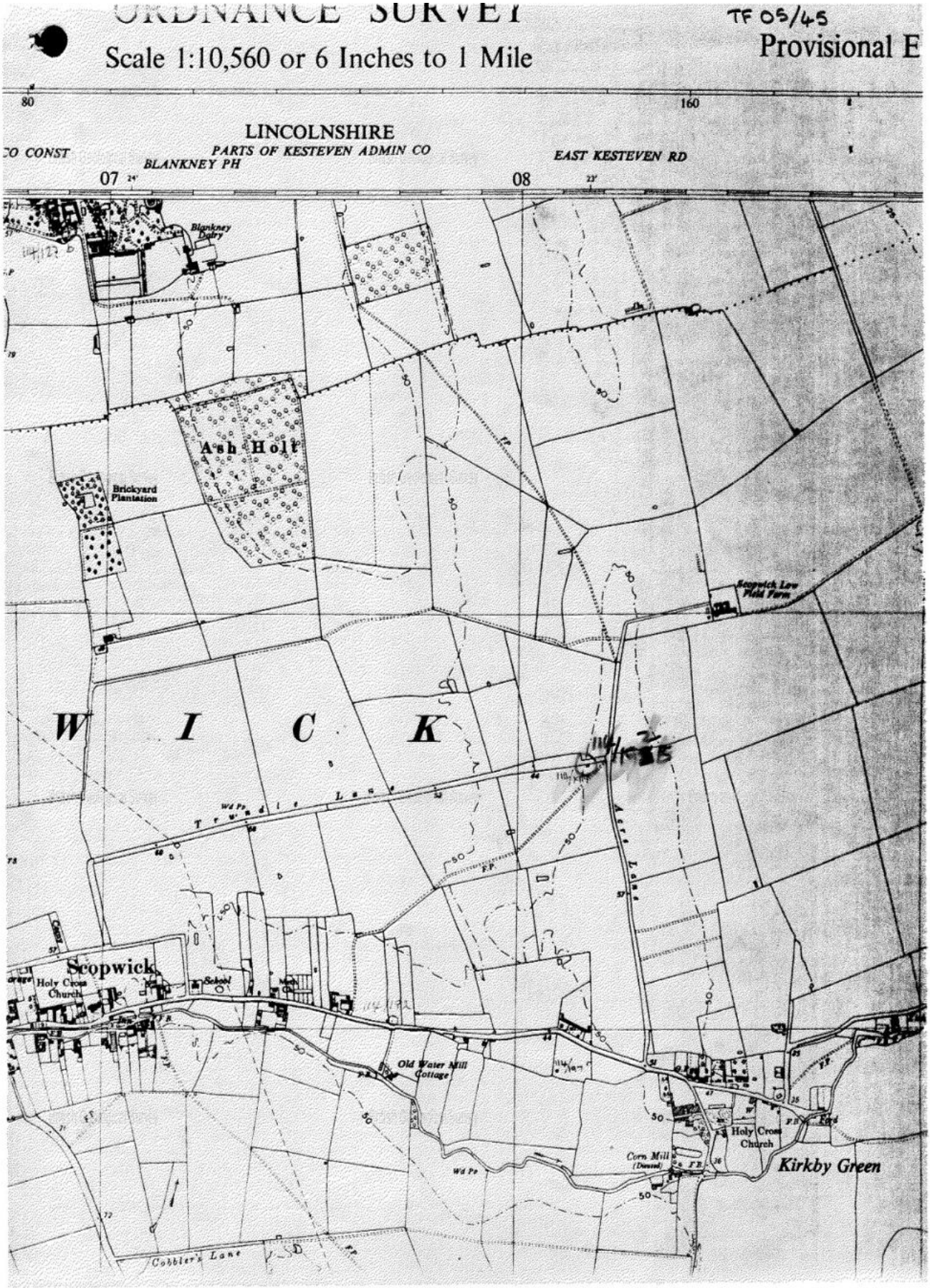
PER. G.D.G. 6.12.79.

114/192 B

British Geological Survey

Version 2.0.6.6

BGS ID: 469031 : BGS Reference: TF05NE22
British National Grid (27700) : 508170,358640
[redacted]


ORDNANCE SURVEY
TF 05/45
Provisional E
Scale 1:10,560 or 6 Inches to 1 Mile
80
160
LINCOLNSHIRE
PARTS OF KESTEVEN ADMIN CO
BLANKNEY PH
EAST KESTEVEN RD
07
08
Blankney Dairy
Ash Holt
Brickyard Plantation
Scopwick Low Field Farm
W I C K
Scopwick
Holy Cross Church
School
Old Water Mill Cottage
Holy Cross Church
Corn Mill (Disused)
Kirkby Green
Cobbler's Lane

APPENDIX F SITE RECONNAISSANCE PHOTOGRAPHS

APPENDIX F SITE RECONNAISSANCE PHOTO LOG

PHOTOGRAPHIC LOG

Photo no.	**Date:**
1	20/10/2022

South west

Description:

Zone M9 - Minor road running onto the site.

Photo No.	**Date:**
2	20/10/2022

North west

Description:

Zone M9 - Overhead services running along the northern site boundary.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
3	20/10/2022

East

Description:

Zone M9 - Residential home which does not form part of the site.

Photo No.	**Date:**
4	20/10/2022

South East

Description:

Zone M9/M5 - Area subject to tree planting

PHOTOGRAPHIC LOG

Photo no.	**Date:**
5	20/10/2022

North west

Description:

Zone M9/M5 - Field forming part of the site. Farmhouse in the distance does not form part of the site.

Photo No.	**Date:**
6	20/10/2022

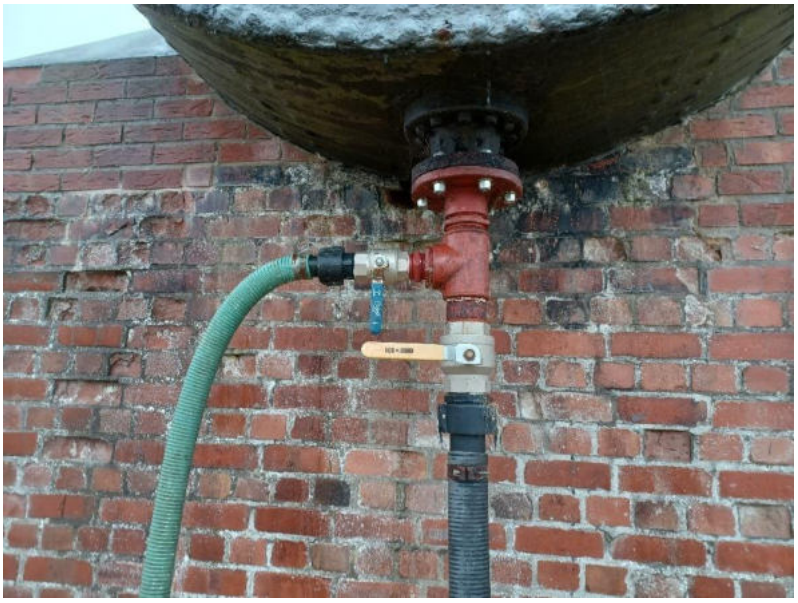
North east

Description:

Zone M5 - Water tank does not form part of the site boundary

PHOTOGRAPHIC LOG

Photo no.	**Date:**
7	20/10/2022



Description:

Zone M5 - Tap on water tank

Photo No.	**Date:**
8	20/10/2022

South

Description:

Zone M5 - View of water tank

PHOTOGRAPHIC LOG

Photo no.	**Date:**
9	20/10/2022

South east

Description:

Zone M5 - Remnants from a bonfire and a barn. This area doesn't form part of the site.

Photo No.	**Date:**
10	20/10/2022

South

Description:

Zone M5 - Services noted

PHOTOGRAPHIC LOG

Photo no.	**Date:**
11	20/10/2022

South west

Description:

Zone M5 - View across field which forms part of the site.

Photo No.	**Date:**
12	20/10/2022

East

Description:

Zone M6 - Railway line running adjacent to the site on the eastern boundary.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
13	20/10/2022

South west

Description:

Zone M5 - View across field which forms part of the site.

Photo No.	**Date:**
14	20/10/2022

West

Description:

Zone M5 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
15	20/10/2022

South west

Description:

Zone M5/M1 - View across field which forms part of the site. Overhead services noted running across the site.

Photo No.	**Date:**
16	20/10/2022

South east

Description:

Zone M5/M6 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
17	20/10/2022

South east

Description:

Zone M2 - View across field which forms part of the site.

Photo No.	**Date:**
18	20/10/2022

South west

Description:

Zone M1 - View across field which forms part of the site. Overhead services noted running across the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
19	20/10/2022

South west

Description:

Zone J14 - View across field which forms part of the site. Overhead services noted running across the site.

Photo No.	**Date:**
20	20/10/2022

West

Description:

Zone J14 - Small footbridge over drainage ditch.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
21	20/10/2022

East

Description:

Drainage ditch running between fields, and overhead services crossing the site.

Photo No.	**Date:**
22	20/10/2022

South east

Description:

Zone J14 - View across field which forms part of the site. Overhead services noted running across the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
23	20/10/2022

West

Description:

Zone J13 - View across field which forms part of the site.

Photo No.	**Date:**
24	20/10/2022

South west

Description:

Zone J9 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
25	20/10/2022

South east

Description:

Zone J13 - View across field which forms part of the site.

Photo No.	**Date:**
26	20/10/2022

West

Description:

I16 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
27	20/10/2022

South west

Description:

Zone I12 - View across field which forms part of the site.

Photo No.	**Date:**
28	20/10/2022

North west

Description:

Zone I16 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
29	20/10/2022

Description:

Zone I16 - Underground service.

Photo No.	**Date:**
30	20/10/2022

North west

Description:

Zone M1/L4 - Overhead services noted running across the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
31	20/10/2022

North east

Description:

Zone M1 - Barn which is part of Scopwick Low Field Farm. This building is not included within the site boundary.

Photo No.	**Date:**
32	20/10/2022

East

Description:

Zone J13 - Buildings which are part of Scopwick Low Field Farm. These structures are not included within the site boundary.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
33	20/10/2022

North west

Description:

Zone I16 - View across field which forms part of the site.

Photo No.	**Date:**
34	20/10/2022

North west

Description:

Zone L4 - View across field which forms part of the site. Overhead services noted.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
35	20/10/2022

North

Description:

Zone L3/L4 - View across field which forms part of the site, with some waterlogging observed.

Photo No.	**Date:**
36	20/10/2022

South west

Description:

Zone I15 - Underground service covers noted.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
37	20/10/2022

Description:

Zone I15 - Underground service covers noted.

Photo No.	**Date:**
38	20/10/2022

South west

Description:

Zone I15 - Borehole noted.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
39	20/10/2022

South west

Description:

Zone I15 - View across field which forms part of the site.

Photo No.	**Date:**
40	20/10/2022

South east

Description:

Zone I15 - Pylons noted running across the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
41	20/10/2022

West

Description:

Zone I14 - View across field which forms part of the site.

Photo No.	**Date:**
42	20/10/2022

North

Description:

Zone I14 - View across field which forms part of the site. Pylons noted running across the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
43	20/10/2022

West

Description:

Zone I14/I15 - View across field which forms part of the site. Pylons noted running across the site.

Photo No.	**Date:**
44	20/10/2022

East

Description:

Zone L3 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
45	20/10/2022

South

Description:

Zone L2 - View across field which forms part of the site.

Photo No.	**Date:**
46	20/10/2022

East

Description:

Zone L6/L2 - View across field which forms part of the site. The building noted in the distance does not form part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
47	20/10/2022

South

Description:

Zone L7/L3 - View across field which forms part of the site. Overhead services noted running across the site.

Photo No.	**Date:**
48	20/10/2022

East

Description:

Zone L3 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
49	20/10/2022

North west

Description:

Zone L8 - View across field which forms part of the site.

Photo No.	**Date:**
50	20/10/2022

North

Description:

Zone – L8 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
51	20/10/2022

South east

Description:

Zone L4/M1 - View across field which forms part of the site.

Photo No.	**Date:**
52	20/10/2022

North

Description:

Zone L8 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
53	20/10/2022

East

Description:

Zone M5 - Barn structure which does not form part of the site.

Photo No.	**Date:**
54	20/10/2022

North east

Description:

Zone M5 - Barn structure which does not form part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
55	20/10/2022

South

Description:

Zone L8/L12 - View across field which forms part of the site.

Photo No.	**Date:**
56	20/10/2022

North east

Description:

Zone I10 - View across field which forms part of the site. Residential homes do not form part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
57	20/10/2022

North

Description:

Zone I9 - Pumping Station

Photo No.	**Date:**
58	20/10/2022

West

Description:

Zone I9 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
59	20/10/2022

Description:

Zone I9 - Small structures noted.

Photo No.	**Date:**
60	21/10/2022

North west

Description:

Zone I9/H12 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
61	21/10/2022

West

Description:

Zone I9/H12 - View across field which forms part of the site. Underground services noted.

Photo No.	**Date:**
62	21/10/2022

North

Description:

Zone H8 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
63	21/10/2022

North

Description:

Zone H4 - Entrance to an Autism Care Centre adjacent to the site.

Photo No.	**Date:**
64	21/10/2022

South west

Description:

Zone I5 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
65	21/10/2022

South west

Description:

Zone I5 - View across field which forms part of the site.

Photo No.	**Date:**
66	21/10/2022

East

Description:

Zone I5 - An area of tree planting, saplings visible.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
67	21/10/2022

South west

Description:

Zone I5 - View across field which forms part of the site.

Photo No.	**Date:**
68	21/10/2022

South east

Description:

Zone I5 - View across field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
69	21/10/2022

East

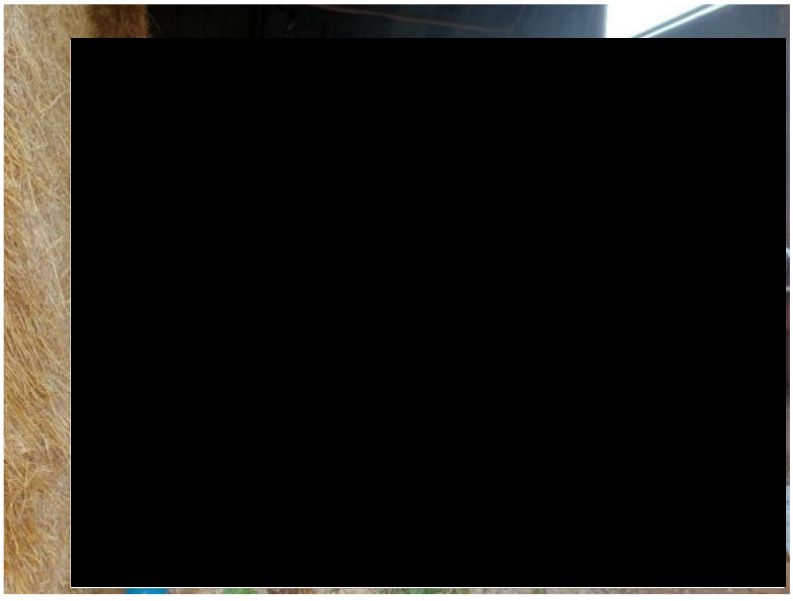
Description:

Zone I5 - Barn structure which does not form part of the site.

Photo No.	**Date:**
70	21/10/2022

Description:

Zone I5 - Barn structure which does not form part of the site.



PHOTOGRAPHIC LOG

Photo no.	**Date:**
71	21/10/2022

South west

Description:

Zone I5 - Stockpiles adjacent to the barn which doesn't form part of the site.

Photo No.	**Date:**
72	21/10/2022

South east

Description:

Zone I5/I1 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
73	21/10/2022

North

Description:

Zone I6 - Gas pipeline marker noted.

Photo No.	**Date:**
74	21/10/2022

North

Description:

Zone I6 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
75	21/10/2022

South east

Description:

Zone I6/I2 - View of field which forms part of the site.

Photo No.	**Date:**
76	21/10/2022

East

Description:

Zone I6 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
77	21/10/2022

East

Description:

Zone I7/I10 - View of field which forms part of the site.

Photo No.	**Date:**
78	21/10/2022

South west

Description:

Zone I1 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
79	21/10/2022

East

Description:

Zone I1 - View of field which forms part of the site.

Photo No.	**Date:**
80	21/10/2022

South west

Description:

Zone I1/H4 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
81	21/10/2022

West

Description:

Zone H4 - View of field which forms part of the site.

Photo No.	**Date:**
82	21/10/2022

South west

Description:

Zone H4 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
83	21/10/2022

East

Description:

Zone F13 - View of field which forms part of the site.

Photo No.	**Date:**
84	21/10/2022

West

Description:

Zone F13 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
85	21/10/2022

South

Description:

Zone F13 - View of field which forms part of the site.

Photo No.	**Date:**
86	21/10/2022

South east

Description:

Zone F13 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
87	21/10/2022

South

Description:

Zone F13/F9 - View of field which forms part of the site.

Photo No.	**Date:**
88	21/10/2022

South

Description:

Zone E16 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
89	21/10/2022

North

Description:

Zone E16 - View of field which forms part of the site. Overhead services present running across the site.

Photo No.	**Date:**
90	21/10/2022

North

Description:

Zone E16 - Small asphalt stockpile located on hardstanding.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
91	21/10/2022

North west

Description:

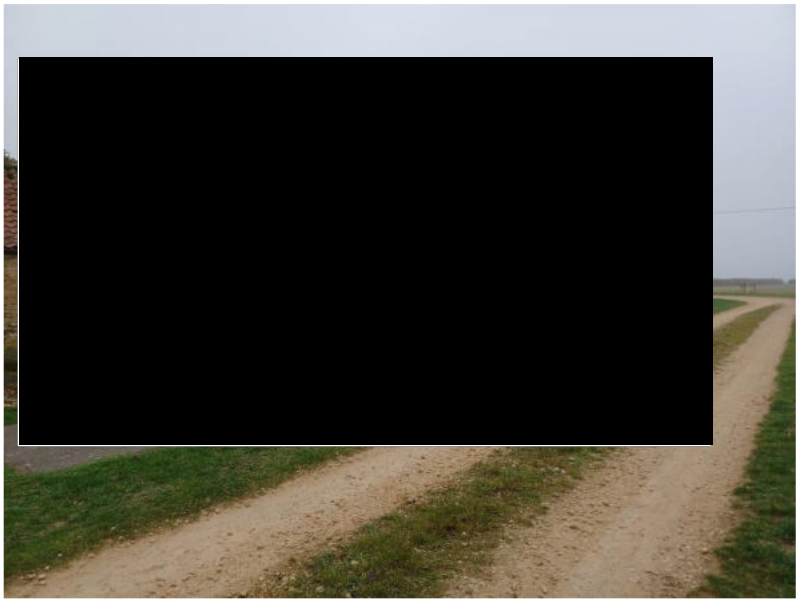
Zone E16 - View of field which forms part of the site.

Photo No.	**Date:**
92	21/10/2022

South west

Description:

E16 - Residential property adjacent to the site.



PHOTOGRAPHIC LOG

Photo no.	**Date:**
93	21/10/2022

West

Description:

Zone E16/E15 - View of field which forms part of the site.

Photo No.	**Date:**
94	21/10/2022

North west

Description:

Zone E15 - Gas tap observed

PHOTOGRAPHIC LOG

Photo no.	**Date:**
95	21/10/2022

West

Description:

Zone E15 - View of field which forms part of the site.

Photo No.	**Date:**
96	21/10/2022

N/A

Description:

Zone E15 - Gas tap observed

PHOTOGRAPHIC LOG

Photo no.	**Date:**
97	21/10/2022

West

Description:

Zone E14/E15 - View of field which forms part of the site.

Photo No.	**Date:**
98	21/10/2022

North

Description:

Zone E14 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
99	21/10/2022

East

Description:

Zone H2 - Haybale stacks.

Photo No.	**Date:**
100	21/10/2022

North west

Description:

Zone H2 - Haybale stacks.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
101	21/10/2022

North west

Description:

Zone H2 - View of field which forms part of the site. The buildings in the distance do not form part of the site.

Photo No.	**Date:**
102	21/10/2022

South west

Description:

Zone E13/E14 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
103	21/10/2022

South west

Description:

Zone E13 - View of field which forms part of the site.

Photo No.	**Date:**
104	21/10/2022

East

Description:

Zone E9 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
105	21/10/2022

South east

Description:

Zone E10 - View of field which forms part of the site.

Photo No.	**Date:**
106	21/10/2022

East

Description:

Zone E9 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
107	21/10/2022

N/A

Description:

Zone E9 - Underground service noted.

Photo No.	**Date:**
108	21/10/2022

South

Description:

Zone E9 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
109	21/10/2022

South west

Description:

Zone E9/E5 - View of field which forms part of the site. Pylons are visible running across the site.

Photo No.	**Date:**
110	21/10/2022

East

Description:

Zone E5/E6 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
111	21/10/2022

South

Description:

Zone E5 - View of field which forms part of the site. Pylons visible running across the site.

Photo No.	**Date:**
112	21/10/2022

East

Description:

Zone E5/E6 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
113	21/10/2022

South west

Description:

Zone E1 - View of field which forms part of the site.

Photo No.	**Date:**
114	21/10/2022

South east

Description:

Zone E1/E2 - View of field which forms part of the site. The buildings in the distance do not form part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
115	21/10/2022

North west

Description:

Zone B13/B14 - View of field which forms part of the site. Pylons visible running through the site.

Photo No.	**Date:**
116	21/10/2022

South west

Description:

Zone B13/B14 - View of field which forms part of the site. Overhead services visible running through the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
117	21/10/2022

South

Description:

Zone B14 - View of field which forms part of the site. Pylons visible running through the site.

Photo No.	**Date:**
118	21/10/2022

South

Description:

Zone B14 - View of field which forms part of the site. Pylons visible running through the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
119	21/10/2022

South

Description:

Zone B15 - View of field which forms part of the site. Pylons visible running through the site.

Photo No.	**Date:**
120	21/10/2022

East

Description:

Zone B15 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
121	21/10/2022

West

Description:

Zone E2 - View of field which forms part of the site. Pylons visible running through the site.

Photo No.	**Date:**
122	21/10/2022

South east

Description:

Zone E2/E7/E3 - View of field which forms part of the site. Overhead services visible running through the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
123	21/10/2022

North east

Description:

Zone E7 - View of field which forms part of the site. Overhead services visible running through the site.

Photo No.	**Date:**
124	21/10/2022

South east

Description:

Zone E3 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
125	21/10/2022

North

Description:

Zone E7 - View of field which forms part of the site. Buildings in the distance do not form part of the site.

Photo No.	**Date:**
126	21/10/2022

North

Description:

Zone B13 - View of field which forms part of the site. Pylons visible running through the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
127	21/10/2022

North

Description:

Zone B13/A16 - View of field which forms part of the site. Pylons visible running through the site.

Photo No.	**Date:**
128	21/10/2022

West

Description:

Zone A16 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
129	21/10/2022

North east

Description:

Zone A16 - An area of hardstanding. Pylons visible running through the site.

Photo No.	**Date:**
130	21/10/2022

Description:

Zone E1 - View of fields which form part of the site. Pylons visible running through the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
131	21/10/2022

Description:

Zone E1 - Agricultural loading/storage area. Haybales visible.

Photo No.	**Date:**
132	21/10/2022

North

Description:

Zone E5/D8 - View of field which forms part of the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
133	21/10/2022

South

Description:

Zone D12 - View of field which forms part of the site. Pylons visible running across the site.

Photo No.	**Date:**
134	21/10/2022

North west

Description:

Zone D12 - View of field which forms part of the site. Pylons visible running across the site.

PHOTOGRAPHIC LOG

Photo no.	**Date:**
135	21/10/2022

North east

Description:

Zone D11 - Pylons visible running across the site.

APPENDIX G TECHNICAL BACKGROUND

G1 Desk Study

Aquifer designation and Source protection zones

Principal aquifer: layers of rock or drift deposit that have high intergranular and/or fracture permeability (usually providing a high level of water storage). They may support water supply and/or river base flow on a strategic scale.

Secondary A aquifer: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Secondary B aquifer: predominantly lower permeability layers that may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

Secondary undifferentiated aquifer: it has not been possible to attribute either a category A or B to a rock type. In most cases this means that it was previously designated as both a minor and non-aquifer in different locations owing to the variable characteristics.

Unproductive' strata: low permeability with negligible significance for water supply or river base flow.

The EA generally adopts a three-fold classification of source protection zones (SPZ) surround abstractions for public water supply. The Site is situated in an area defined as follows:

- Zone 1 or the 'inner protection zone' is located immediately adjacent to the groundwater source and is based on a 50-day travel time from any point below the water table to the source. It is designed to protect against the effects of human activity and biological/chemical contaminants that may have an immediate effect on the source
- Zone 2 or the 'outer protection zone' is defined by a 400-day travel time from a point below the water table to the source. The travel time is designed to provide delay and attenuation of slowly degrading pollutants
- Zone 3 or the 'total catchment' is the area around the source within which all groundwater recharge is presumed to be discharged at the source.

Preliminary risk assessment methodology

LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. An outline conceptual model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) contaminant linkages (contaminant–pathway–receptor) and is used as the basis for the design of the site investigation. The outline conceptual model is updated as further information becomes available, for example as a result of the site investigation.

Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the

likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- highly likely: the event appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution
- likely: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term
- low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term
- unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- severe: short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000)
- medium: chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem
- mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment
- minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the probability of an event occurring and its consequences have been classified, a risk category can be assigned according to the table below.

		Consequences			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**Highly likely**	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Definitions of these risk categories are as follows together with an assessment of the further work that may be required:

- very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability; urgent investigation and remediation are likely to be required
- high: harm is likely to occur. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required. Remedial works may be necessary in the short term and are likely over the long term
- moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term
- low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild
- very low: there is a low possibility that harm could occur and if realised the harm is unlikely to be severe.

APPENDIX H PRELIMINARY UXO ASSESSMENT

STAGE 1 PRELIMINARY UXO RISK ASSESSMENT

REPORT REF: PRA-22-1948 | Revision: 0

Client: RSK
Project: Land at Ashby de la Launde and Scopwick, Lincolnshire
Date: 08/11/2022

BRIMSTONE SITE INVESTIGATION
Suite 6, Delta House, Laser Quay,
Culpeper Close, Rochester, ME2 4HU
[redacted]

INTRODUCTION

The Stage 1 Preliminary Risk Assessment is an initial screening assessment designed to highlight any sources of unexploded ordnance (UXO) with the potential to contaminate a given site.

The aim of the Stage 1 assessment is to identify or discount the need for further detailed research - a Stage 2 Detailed UXO Risk Assessment.

This desktop assessment has been researched and written by a dedicated Researcher / Risk Assessor and produced in accordance with the CIRIA C681 Guidelines: 'Unexploded Ordnance, a Guide for the Construction Industry' (published in 2009).

In preparation for this assessment, original wartime records, historic OS mapping and the *Brimstone UXO Sources Database* have been reviewed. The latter incorporates multiple datasets plotting the positions of a variety of domestic military sites and confirmed historic German bombing targets.

The Stage 1 Preliminary Risk Assessment considers the following:

1. The Proposed Works
2. Enemy Action during WWI and WWII
3. British / Allied Military Activity
4. Historic Site Occupancy
5. Risk Mitigating Factors

THE SITE

The Site (approximately centred on the National Grid Reference TF 05010 55383) is located in Lincolnshire, between Metheringham and Cranwell Village. The Site measures approximately 10.1km from its most south-western and north-eastern points.
The Site comprises a large area of almost entirely undeveloped open ground, likely used agriculturally, as well as several wooded areas. Roadways and groups of farm buildings are also interspersed throughout the Site.
The Site is largely bound by similar terrain; open land likely used for farming. Railway sidings bind a section of the Site to the east, and the villages of Blankney, Scopwick, Kirkby Green and Ashby de la Launde are also located in relatively close proximity to the Site boundary. RAF Digby, a current military base, is situated to the immediate west of the Site.

THE PROPOSED WORKS

While GI works will be carried out on Site in the future, no information regarding the specific works was available at the time of writing.
Development works on Site comprise the construction of a solar farm.

ENEMY ACTION DURING WWI AND WWII

Potential Source of UXO	Significant?	Details
WWI German Bombing	×/✓	On 12th/13th April 1918, Zeppelin L 63 dropped a 100kg HE bomb in a field at Blankney Park (located immediately north of the Site) before heading north, away from the Site.

WWII German Bombing	✓	British District Bombing Density Statistics	The Site was formerly located within the WWII-era Rural District of East Kesteven which sustained 2.4 bombs / 1,000 acres, a very low bombing density.
		Evidence of bomb strikes / damage	Information obtained from the Sleaford Gazette, pertaining to how many air raids affected individual settlements in the region, indicates that many air raids affected the wider study area. Six air raids affected Scopwick and two affected Ashby de la Launde, both located in close proximity to the east of the Site, while four affected Blankney, situated to the north. Evidence also indicates that RAF Digby, located immediately to the west of the Site, was bombed on several occasions. No evidence of bomb damage has been identified on the Site; however, records are limited at this stage, with no available aerial photography, thereby prohibiting analysis of ground conditions.
		Local Bombing Decoy Sites	The closest was located approximately 3.7km to the south-east of Site.
		Local German Bombing Targets	There is no evidence of any primary Luftwaffe targets in the vicinity of the Site. However, given the numerous bomber airfields in Lincolnshire, as well as the presence of several such airfields in the vicinity of the Site, including RAF Digby immediately to the west, it is possible that enemy aircraft deliberately targeted the local area.
WWII German Cross Channel Artillery Shelling	×	n/a	
BRITISH / ALLIED MILITARY ACTIVITY			
Potential Source of UXO	**Significant?**	**Details**	
WWII Home Guard (HG) activity	×/✓	Soldiers of the 2nd East Kesteven (Sleaford) Home Guard (HG) Battalion may have been responsible for defending the study area during WWII. The possibility that the Site was accessed by armed HG soldiers cannot be discounted at this stage, given its undeveloped nature.	
Site requisitioned for wartime military use	×/✓	No such evidence found at this stage. However, given the presence of several RAF stations in the vicinity, including partially within and immediately to the west, military activity on Site cannot be entirely ruled out at this stage.	
Existing or historic Army or RAF training area / weapons range	×/✓	No such evidence found at this stage. However, given the presence of RAF Digby partially within and immediately to the west of the Site, it cannot be ruled out that aircraft or infantry training has taken place at this stage.	
Existing or historic military bases and other installations	×/✓	None wholly recorded on Site; however, RAF Digby was situated partially within and immediately to the west. The true extent of the airfield during WWII cannot be accurately deduced without historical aerial photography and airfield station plans.	
Existing or historic munitions or explosives factories	×	n/a	
Existing or historic military storage depots	×/✓	None recorded on Site; however, given that RAF Digby was situated partially within and immediately to the west, the possibility that the Site was used for the storage of ordnance during WWII cannot be ruled out at this stage.	

Existing or historic military defensive fortifications	✓	An in-house geo dataset records two pillboxes, likely associated with RAF Digby, within the west of the Site. Additional pillboxes lie within the perimeter of the former airfield.
WWII light and / or heavy anti-aircraft (LAA and HAA) fire	×/✓	Two HAA batteries were established within a 15km radius of the Site, whilst LAA batteries likely defended the airfields in the vicinity as well, with at least one recorded at RAF Digby approximately 140m to the west of the Site. Luftwaffe raids in the region were somewhat frequent, although not particularly intense, and therefore these guns may have expended ammunition over the wider area. It is possible that an unexploded AA shell struck the Site.
WWII pipe-mined locations and beach minefields	×	n/a
SITE HISTORY		
What was the Site occupancy historically, especially during WWI and WWII?	WWII-era OS mapping indicates that the composition of the Site was largely similar to the present day, mainly comprising undeveloped open land, wooded areas, and farmsteads.	
RISK MITIGATING FACTORS		
Post-conflict ground works	There do not appear to have been any significant ground works across the Site since WWII. The laying of hardstanding for new roadways and the ploughing of agricultural land may have disturbed the soil to very shallow depths (<1m bgl).	
Likelihood of UXO remaining	The risk associated with (any) deep (>2m bgl) or shallow (1-2m bgl) buried German UXBs and HAA shells will not have been mitigated across the Site. The risk associated with (any) very shallow buried UXO, including Allied SAA/LSA and HAA shells, will have been partially mitigated.	
CONCLUSIONS		

German UXO:

- The Site was formerly located within the WWII-era Rural District of East Kesteven which sustained 2.4 bombs / 1,000 acres, a very low bombing density. Despite this, the presence of several airfields in the vicinity of the Site, including immediately adjacent to the west, as well as a bombing decoy approximately 3.7km to the south-east, may have elevated the local bombing density. Indeed, anecdotal evidence indicates that villages in close proximity to the Site boundary sustained bombing on several occasions each, with RAF Digby also noted to have been targeted on occasion.
- Given that the Site appears to have mainly comprised undeveloped open land during WWII, evidence of UXBs is likely to have been less noticeable; the entry hole of a 50kg UXB could be as little as 20cm in diameter. Furthermore, access is likely to have been less frequent in comparison to a house or roadway, for example, reducing the likelihood of UXBs being observed at the time.
- In summary, there is evidence of air raids affecting areas in close proximity to the Site, indicating that enemy aircraft likely flew over the Site on multiple occasions. Furthermore, conditions on Site are typically unconducive to the detection of UXBs. A necessarily macro-scale approach has been taken with this assessment given the size of the Site. While specific areas of the Site may be at a greater or lesser risk of contamination with UXO than others, given the lack of available records at this stage, it has not been possible to discount the potential German UXO contamination on Site. It would therefore be considered prudent to investigate available written records and aerial photography to assess the risk accurately.

British / Allied UXO:

- RAF Digby was located partially within and immediately to the west of the Site during and after WWII. An in-house geo dataset records two pillboxes, two aircraft disposal pens, and a loopholed wall, all likely associated with the airfield, within the Site boundary. Given the undeveloped nature of the Site, it cannot be ruled out that military activity in the form of ad hoc training exercises or the storage/disposal of ammunition may have taken place in this area of the Site. Given this, the risk from Allied UXO is considered to be elevated above the background level for Lincolnshire.
- It is quite possible that an unexploded British AA shell struck the Site during WWII and penetrated to a shallow depth. Any such item could have been overlooked and remain in situ.

RECOMMENDATION(S)	
SI Works	A **Stage 2 Detailed Risk Assessment** is recommended to assess the risk to the proposed works.
Development Works	

Springwell
Solar Farm

springwellsolarfarm.co.uk

Application Document Ref: EN010149/APP/6.3
Planning Inspectorate Scheme Ref: EN010149