DRILLER'S NOTEBOOK

W-0567

WELL RECORD

Driller THORPE WELL CO.

Address 2340 - 6th AVE

DES MOINES, IA.

~~Farmer~~ Town HOLSTEIN, IA

Owner

RETURN TO

IOWA GEOLOGICAL SURVEY

Des Moines, Iowa

IOWA CITY, IOWA

WHEN RECORD IS COMPLETED PUT IN ENVELOPE AND MAIL TO

THE DIRECTOR

IOWA GEOLOGICAL SURVEY

DES MOINES, IOWA

IOWA CITY, IOWA

SUGGESTIONS TO DRILLERS

1. Samples should be taken from each bed passed through, and never more than ~~five~~ 3 feet apart, even in the same bed.

2. Samples should not be washed, as washed samples give a wrong idea of the character of the bed.

3. Sacks will be furnished by the Survey.

4. All oyster, clam, or other fossil shells should be placed in the bags with the material in which they are found, and marked with the depth from which obtained.

5. Fill out the label on each bag.

6. Note depth and thickness of all water-bearing layers.

7. Note the quality of the water from each layer: As hard, soft, salty, alkaline, or sulphur bearing.

8. Note height to which water from each layer rises in well, and give flow in gallons per minute.

9. Make frequent use of the "Description" column to explain your notes.

10. If you do not understand what is wanted, or desire information on any point, write to this office.

11. Sacks may be boxed and sent to IOWA GEOLOGICAL SURVEY, ~~DES MOINES~~ Iowa City, IOWA, by express collect.

The Survey desires to assist and cooperate with owners and drillers in every way possible, and will be glad to answer questions.

WELL RECORD

Well is located ..... *miles in a* ..... *direction*

from HOLSTEIN (Post office) *in* IOWA (State), *in the*

SW¼ NW¼ NW¼ NW¼ ¼ ¼ *sec.* 35 *T.* 89 N. *R.* 40 W.

Owner CITY OF HOLSTEIN,

Address IOWA.

Contractor THORPE WELL CO

Address DES MOINES IA.

Well begun June 10 *1937*; *completed* ....., *193*

Rig used—cable, rotary, jet, or Cable

Maker THORPE WELL CO

Diameter of well at mouth 20 (Inches); *at bottom* ..... (Inches)

Depth of well ..... (Feet); *Length and size of casing* .....

.....

Water at ..... *ft.*
(Depths in feet)

Main supply at ..... *ft.*

Water head ..... *ft.*

Is well pumped? .....; *Yield* .....
(Gallons per minute)

.....

.....

.....

Recorded by .....

Address .....

Sample No.	DEPTH		THICKNESS	DESCRIPTION OF BEDS
	From	To		KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
1	0	5	5	Top soil + clay yellowish
2	5	13	8	Yellow clay
3	13	16	3	Sand, coarse, yellowish.
4	16	20	4	yellow clay, sand + gravel.
5	20	25	5	" " " "
6	25	27	2	Sand + gravel.
7	27	30	3	yellow clay bluish, sand + gravel
8	30	35	5	" " " " "
9	35	40	5	" " " " "
10	40	45	5	Blue Clay.
11	45	50	5	Blue clay, Gravelly
12	50	55	5	" " "
13	55	60	5	" " "

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
14	60	65	5	Blue clay Gravelly
15	65	70	5	" " "
16	70	75	5	" " "
17	75	80	5	" " "
18	80	85	5	" " "
19	85	90	5	" " "
20	90	95	5	" " "
21	95	100	5	" " "
22	100	105	5	Shale bluish, green
23	105	108	3	" " "
24	108	110	2	Clay, drab. gravely
25	110	115	5	" " "
26	115	120	5	" " "

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
27	120	125	5	Clay, drab, gravely
28	125	130	5	Yellow clay "
29	130	135	5	Clay, Drab, hard
30	135	140	5	Clay, " "
31	140	145	5	Clay, Clay, Buff
32	145	150	5	Drab " "
33	150	155	5	" " "
34	155	160	5	" " "
35	160	165	5	" Drab, layey
36	165	170	5	" " "
37	170	175	5	" " "
38	175	180	5	" " "
39	180	185	5	" " "

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
40	185	190	5	Till, Drab, clayey
45	190	195	5	Till, Drab, Clayey, Boulders
46	195	200	5	" " " "
47	200	205	5	" " " "
48	205	210	5	" " " , Sandy
49	210	215	5	" " " "
50	215	220	5	" " " "
51	220	225	5	" " " "
52	225	230	5	" " " "
53	230	235	5	Till, Buff, sandy
54	235	240	5	" Brown, Rocky,
55	240	245	5	" " " yellowish
56	245	250	5	" " " "
57	250	255	5	Till, yellowish, sandy.

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
58	255	260	5	sand, clay
59	260	265	5	Till, blue, rocky
60	265	270	5	Till " " , brownish
61	270	275	5	" " rocky mixture
62	275	280	5	" " brownish, streaks rocky
63	280	285	5	" Brownish
64	285	290	5	" "
65	290	295	5	" " "
66	295	300	5	" " "
67	300	305	5	" Blue rocky
68	305	310	5	" " "
69	310	315	5	" " "
70	315	320	5	" " "

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
71	320	325	5	Till, blue, yellowish, Rocky
72	325	330	5	Clay Mixed with Rock
73	330	335	5	Clay and rock
74	335	340	5	Clay Blue — Rock.
75	340	345	5	Brown Clay — rock.
76	345	450	5	Blue clay — rock
77	350	355	5	Blue clay — rock
78	355	360	5	Blue clay — rock
79	360	365	5	Blue clay — rock
80	365	370	5	Fine sand
81	370	375	5	Clay, rocky
82	375	380	5	" "
83	380	386	6	" "

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
84	386	393	7	Sand
85	393	395	2	Blue clay
86	395	400	5	sandy shale
87	400	405	5	clay – rocky
88	405	410	5	clay –
89	410	415	5	Sandy - clay
90	415	420	5	" "
91	420	425	5	shale
92	425	430	5	Red & Gray Shale
93	430	435	5	Shale & Sandstone
94	435	440	5	Shale; Red and Gray
95	440	445	5	mud & shale
96	445	450	5	Red & Blue Shale

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
97	450	455	5	Red Shale
98	455	460	5	Gray shale
99	460	465	5	reddish shale
100	465	470	5	red and gray shale
101	470	475	5	Red Shale
102	475	480	5	Red Shale
103	480	485	5	" "
104	485	490	5	" "
105	490	495	5	Red Shale
106	495	500	5	Red Shale
107	500	505	5	Sand stone & Gray Shale
108	505	510	5	Reddish shale
109	510	515	5	" "
110	515	520	5	" "

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
111	520	525	5	Sandy shale
112	525	530	5	" "
113	530	535	5	Sandy shale
114	535	540	5	" "
115	540	543	3	Sand stone
116	543	550	7	Sand & shale
117	550	555	5	sand
118	555	560	5	Sand
119	560	565	5	Sand
120	565	570	5	Sand
121	570	575	5	Sand
122	575	580	5	Sand
123	580	585	5	Sand
124	585	590	5	Sand

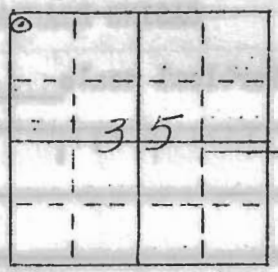
Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS — KIND OF ROCK, COLOR, HARD OR SOFT WATER, ETC.
125	590	595	5	sand
126	595	600	5	sand
127	600	605	5	sand
128	605	610	5	sand
129	610	615	5	sand
130	615	620	5	sand, shale (grey) limestone (flinty)
131	620	625	5	" " " " "
132	625	630	5	Lime (brown) shale (grey)
133	630	635	5	Lime stone — grey
134	635	640	5	Limestone
135	640	644-7	4'-7"	Limestone

IOWA GEOLOGICAL SURVEY W-0567

In Cooperation with U. S. Geological Survey

RECORD OF WELL

Location:



SE cor. 2nd & Main Sts.

Town: Holstein (N E / S W): County Ida E.

SW¼-NW¼-NW¼-NW¼ sec. 35 T 89 N., R. 40 W. Griggs Twp.

Well name and number City Well #3

Owner _____ Address _____

Tenant _____ Address _____

Contractor Thorpe Well Co Address Des Moines

Drillers _____

Drilling dates June 10, 1937 -

Well data:

Elevations: Drilling curb 1454 feet; Land surface _____ feet

Determined by _____

Topographic position Upland

Total depth: Reported 649'8" feet, Measured _____ feet

Drilling method cable tool

Hole and casing data 20" hole at top

149'3" of 20" casing 0 - 149'3"

549'1" of 16" casing from 0 - 549'1"

100' of 10" brass strainer resting on bottom

Original depth to water _____ ft. above/below _____ Date _____

Original elevation of water level _____ ft.; Source of data _____

Sources of water: Principal Cretaceous 540 - 615'; Others _____

Production data: Date

Static depth to water 321'11" Measuring point top of casing
Pumping level 334'4" at 240 g.p.m.

Specific capacity g.p.m. per ft. drawdown; Temperature 57 °F.

Pump data: Type pump Turbine Column Dia. Length 395
Cylinder or bowls: Dia. Length Suction pipe 10

Power Electricity 30 hp Airline

Estimated rate of production: g.p.m. for hrs. a day
Use of water

WATER ANALYSES (in parts per million)

Date samples	March 24, 1938			
Sampled by	H.G. Hershey			
Total solids	1453.0			
Insoluble matter	9.0			
Alkalinity (Meo)	290.0			
Alkalinity (Phn)	0.0			
pH	6.8			
$Fe_2O_3 + Mn_2O_3 + Al_2O_3$	12.0			
Alkali as sodium	102.3			
Calcium	238.7			
Magnesium	64.2			
Iron (unfiltered)	1.3			
Manganese	0.50			
Nitrate	0.00			
Fluoride	1.0			
Chloride	9.0			
Sulfate	762.7			
Bicarbonate	353.8			
Hardness (ppm)	863.0			
Hardness (gpg)	50.5			

Remarks

Laboratory data: Sample storage location
Sample range 0 - 644'7½" No. spls. 136 No. dupls. & cond. 141 good
Spls. prepared by Washed range by
Driller's log and cond. Yes very good
Insoluble residues: Prepared by Studied by Strip log
Microscopic study gulf strip log ✓
Gen. log yes Correl. by Cumedy

Punched FCH

WRD Exp. (CW) Aug. 1964 Verified PMJ

U. S. DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

Water Resources Division Well Schedule Form

MASTER CARD

COUNTY, HWY

Record by D. AA RONSON Source of data FILE Date 6/24/65 Map 1:63,360

State IOWA [16] County (or town) IDA [47]

Latitude: [42 39 15 N] (N/S) Longitude: [095 32 15] (12 degrees 15 min sec 18) Sequential number: [3]

Lat-long accuracy: [2] T. 89 (N) S, R 40 (W) Sec 35, NW ¼, NW ¼, NW ¼ 5

Local well number: [C-21-79-40W35D bb] Other number: B & M W-0567

Local use: [0056 37C ITY 3] Owner or name: TOWN OF HOLSTEIN

Owner or name: [HOLSTEIN IOWA] Address: HOLSTEIN, IOWA

Ownership: (C) County, (F) Fed Gov't, (M) City, (N) Corp or Co, (P) Private, (S) State Agency, (W) Water Dist [M]

Use of water: (A) Air cond, (C) Comm, (D) Dewatering, (F) Fire, (H) Dom, (I) Irr, (N) Ind, (P) S, (S) Stock, (T) Instit, (U) Unused [P]

Use of well: (A) Anode, (D) Drain, (G) Seismic, (O) Obs, (P) Oil-gas, (R) Recharge, (S) Spring, (T) Test, (U) Unused, (W) Withdraw, (X) Waste, (Z) Destroyed [W]

DATA AVAILABLE: Well data [1] Freq. W/L meas.: INVENTORY [C] Field aquifer char.

Hyd. lab. data:

Qual. water data; type: COMPLETE [C]

Freq. sampling: INTERMITTENT [I] Pumpage inventory: yes / no, period:

Aperture cards: yes

Log data: GEOLOGIST LOG - DRILLER'S LOG [G D]

WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD Depth well: 649' 8" ft [6 4 5] (Meas. / Repr.) [3]

Depth cased (first perf.): 549' 1" ft [5 5 0] Casing type: STEEL; Diam. 16 in accuracy [1 6]

Finish: (C) porous concrete, (F) gravel w. (perf.), (G) gravel w. (screen), (H) horiz. gallery, (O) open end, (P) perf., (S) screen, (T) sd. pt., (W) shored, (X) open hole, (Z) other [5]

Method Drilled: (A) air rot, (B) bored, (C) cable, (D) dug, (H) hyd rot., (J) jetted, (P) air percussion, (R) reverse rotary, (T) trenching, (V) driven, (W) drive wash, (Z) other [C]

Date Drilled: JUNE 1937 [9 3 7] Pump intake setting: 395 ft [3 9 5]

Driller: THORPE WELL CO., DES MOINES, IOWA

Lift (type): (A) air, (B) bucket, (C) cent, (J) jet, (L) multiple, (cent.), (M) multiple, (turb.), (N) none, (P) piston, (R) rot, (S) submerg, (T) turb, (Z) other [T] Deep / Shallow [D]

Power (type): diesel, (elec) nat gas, gasoline, hand, gas, wind; LPG H.P. 30 [V] Trans. or meter no.

Descrip. MP LSD ? ft (above / below) lsd, Alt. MP 1459

Alt. LSD: 1454 [1 4 5 4] Accuracy: (source) [7]

Water Level 32' 11" ft (above / below) MP; Ft (above / below) lsd [3 2 2] Accuracy: [D]

Date meas: [6 3 7] Yield: 240 gpm [2 4 0] Method determined

Drawdown: 12'5" ft [1 2] Accuracy: REPT [6] Pumping period hrs

QUALITY OF WATER DATA: Iron 1.3 ppm [5] Sulfate 762.7 ppm [8] Chloride 9.0 ppm [0] Hard. 863 ppm

Sp. Conduct K x 10^6 Temp. °F Date sampled 3/21/38 [3 3 8]

Taste, color, etc.

089-40W-35 bbb

Well Number 42 d 29 m 15 s (N) S 095 d 32 m 35 s

HYDROGEOLOGIC CARD

SAME AS ON MASTER CARD (1–19)

Physiographic Province: CENTRAL LOWLAND (20–21): 12

Section: WEST 1

LAKE (22): B

Drainage Basin: LITTLE SIOUX (23–25): 36C

Subbasin: (26)

Topo of well site: local depression, flat surface, (D) (F) (H) hilltop, hillside, (S) terrace, (T) valley flat, (V) UPLAND (27): F

MAJOR AQUIFER: CRETACEOUS system, LOWER series (28–29): K1, DAKOTA SANDSTONE aquifer, formation, group (30–31): DX

Lithology: FINE SANDSTONE (32–33): 2V Origin: MARINE (34): 6 Aquifer Thickness: 75 ft (35–37): 075

Length of well open to: 65' 11" ft (38–40): 066 Depth to top of: 540 ft (41–43): 540

MINOR AQUIFER: MISSISSIPPIAN system, UPPER series (44–45): M3, aquifer, formation, group (46–47): X

Lithology: DOLOMITE (48–49): D Origin: MARINE (50): 6 Aquifer Thickness: ft (51–53):

Length of well open to: 25 ft (54–56): 025 Depth to top of: 618 ft (57–59): 618

Intervals Screened: 549' 1" TO BOTTOM (644'8") (SEE BELOW)

Depth to consolidated rock: 393 ft (60–62): 393 Source of data: DRILLERS LOG (64): D

Depth to basement: ft (63–65): Source of data: (66)

Surficial material: (70–71): Infiltration characteristics: (72)

Coefficient Trans: gpd/ft (73–75): Coefficient Storage: (76–78)

Coefficient Perm: gpd/ft²; Spec cap: 20 gpm/ft; Number of geologic cards: (79)

CASING:

20" HOLE AT TOP

0–149'3" – 20" CASING

0–549'1" – 16" CASING

549'8"–644'8" – BRASS STRAINER (3/16"? SLOTS)

10" DIAMETER

8" COUPLING (BRASS) ON TOP OF SCREEN

SE CORNER 2ND & MAIN STS.

GPO 844-225

IOWA GEOLOGICAL SURVEY
Generalized Log Based on Detailed Field
Description of Drill Cuttings

Name of Well: Holstein City Well No. 3 Survey No. W-0567

Drilled by: Thorpe Bros. Well Co. Des Moines Date August 31, 1937

Present Total Depth: 395 ft; Curb Elevation: 1453 ft; Static Level: ____ ft.

Casing Data: 24' of temporary 26" curbing, 0-24'. 149'3" of 20" casing 0-149'3". 395'5" of 16" casing from 0-395'5" less screw-up 0-389'5"

Pump and Screen Data: ____

Pumping Test: ____ Hours ____ Min; Gal. Per Min. ____; Drawdown ____ ft. in ____ min.

Description of Formations

No.	Rock Unit	Thick.	From (Feet)	To
1.	Black topsoil	3	0	3
2.	Clay- yellow, calcareous, sandy. (oxidized and partially leached drift)	10	3	13
3.	Sand- coarse, yellow	3	13	16
4.	Clay- yellow, calcareous, containing sand and gravel. (oxidized, unleached drift)	9	16	25
5.	Sand and gravel- yellow	2	25	27
6.	Clay- yellow, calcareous, containing sand and gravel. (oxidized, unleached drift)	14	27	41
7.	Clay- medium gray, highly calcareous, containing sand & gravel which is more abundant 60'-65', 70'-75'. (Unleached, unoxid. drift)	54	41	95
8.	Clay- light, bluish gray, highly calcareous, very silty, containing some sand & gravel	13	95	108
9.	Clay- similar to 95'-108', but with yellow clay mixed, and containing more and coarser gravel, and less silty.	16	108	124
10.	Clay- yellow, calcareous, containing sand and gravel. (Oxidized, unleached drift)	33	124	157
11.	Clay- medium light gray, highly calcareous, containing sand and gravel. (Unleached, unoxidized drift)	53	157	210
12.	Clay- brown, gray & yellow mixed, less calcareous than 157'-210', containing sand and gravel	50	210	260

Notes:

IOWA GEOLOGICAL SURVEY
Generalized Log Based on Detailed Field
Description of Drill Cuttings

Name of Well: Holstein City Well No. 3 Survey No. W-_____

Drilled by: _____ Date _____, 193__

Total Depth: _____ ft; Curb Elevation: _____ ft; Static Level: _____ ft.

Casing Data: _____

Pump and Screen Data: _____

Pumping Test: ____ Hours ____ Min; Gal. Per Min. _____; Drawdown ____ ft. in ____ min.

Description of Formations

No.	Rock Unit	Thick.	From (Feet)	To
13.	Clay- light brown with little gray, slightly calc., similar to 210'-260' except color	35	260	295
14.	Clay- drab gray, very slightly calcareous except for limey sand &gravel grains.	20	295	315
15.	Clay- gray and light brown mixed with li tle ylw. very slightly calc. except for sd. & gravel	20	315	335
16.	Clay- light pinkish brown, non-calc. for most part very little sand, some dark carbonaceous material in bottom 5'.	10	335	345
17.	Clay- drab gray, some brown, non-calc. except for ls. sand & gravel inclusions.	15	345	360
18.	Silt and clay- light bluish gray, non-calc., little yellow, calc. clay mixed.	5	360	365
19.	Sand- buff gray, medium coarse, glacial.	5	365	370
20.	Clay- light gray & yellow, calcareous, contain- sand and gravel.	10	370	380
21.	Clay- light gray, calc., containing sand & gravel, and non-calc. brown clay or shale.	6	380	386
22.	Sand & fine gravel- gray, glacial.	7	386	393
23.	Shale?- light gray, non-calcareous, little sand and gravel, possibly cave. Not through this unit.		393	395

Notes: Small fragments of cable dropped into hole to aid drilling from 305' to 365'.

Descriptions by H.G.H.

Holstein, Ida Co

March 21, 1938

Old well static 319'11"
Pumping 331'10" after 30 min @ < 140 gpm
with new well pumping
Diff. elev. of two pts. measurement = 1'6" ±

New well →

Pumping level = 334'4" after 1 hr 30 min pumping at an estimated 240 gpm.

Time	Water Level	
9:20	334'4	Pump shut off at 9:20
9:21	319'1"	
9:22	321'1"	
9:23	323'1"	
9:24	323'4½	
9:25	323'3½	
9:30	322'10"	
9:35	322'6"	
9:4[illegible]	322'3"	
9:50	321'11"	Note: This reading is not true static level, because recovery was not complete.

(10"- duro metal screen 100' long stands into 16" casing 3'+)

These readings are not final because not enough time elapsed so that accurate data on static could be obtained.
Mayor Louis Goettsch requested this work.

Complete dd. & recovery meas. should be made when adequate time is available

Temp Air 58° Water 57° at end of 6" discharge 21' from pump after new well had pumped 1½ hrs at est. 240 gpm

Fairbanks Morse 30 H.P. Motor, 330' of 8" column 5" bowls.
380' to top of bowls + 17 8" dia impellors + 10 of 6" suction
Fairbanks-Morse - Omaha.
James D. Renne

38 sections 10" o.D. Wrought Iron

Holstein Well

Dec. 2, 1937

644'8 = T.D
329'7" = static level from top of casing
273 with 29' dd before shooting

549'1" of casing

100' of Brass Cook(?) Strainin (3/16" slots?) 10" dia
8" coupling (brass) on top of screen

Shots			
624	–	20#	60% dynamite
617	–	20#	60% "
602	–	20#	60%

Samples to bottom (530-535 missing)
1/4-1/2" gravel to top of casing + 2'

Holstein, Ida County

City Well No. 3: Water level measurements on November 2, 1939 by T.W.R. and H.G.H. Point of reference: Top surface C.I. motor base, 1 ft. above concrete floor of pump base.

Water Level

Time	Reading	Correction	Corrected
4.17	325	-0.95	324.05
4.20	324.7	-0.95	323.75
4.25	324.6	"	323.65
4.30	324.3	"	323.35
4.45	323.75	"	322.80
5.00	323.5	"	322.55
5.20	323.25	"	322.30
5.30	323.2	"	322.25
6.30	322.9	"	321.95

Correction on line between 320 and 300 feet is -0.96 feet, use -0.95

Hand level to measuring point from C. & G. S. B. M. of depot.