WRD Exp. (GW)
April 1966

Well No. 080-14W-23 CBB

# WELL SCHEDULE

U. S. DEPT. OF THE INTERIOR — GEOLOGICAL SURVEY — WATER RESOURCES DIVISION

## MASTER CARD

Record by D. AARONSON; Source of data FILE; Date 1/30/67; Map 1:63,360 COUNTY HWY.

State IOWA [16]; County (or town) TOWESHIEK [79]

Latitude: 41 43 23 N (deg min sec); Longitude: 092 27 16 (degrees min sec); Sequential number: [1]

Lat-long accuracy: [2]; T 80 N, R 14 W, Sec 23, NW ¼, NW ¼, SW ¼ 5

Local well number: 080 14W 23 CBB; Other number: W-12686 B & M

Local use: 12686 61 CITY 5; Owner or name: BROOKLYN CITY WELL

Owner or name: BROOKLYN IOWA; Address: BROOKLYN, IA

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

Use of water: (A) Air cond, (B) Bottling, (C) Comm, (D) Dewater, (E) Power, (F) Fire, (H) Dom, (I) Irr, (M) Med, (N) Ind, (P) P S, (R) Rec, (S) Stock, (T) Instit, (U) Unused, (V) Repressure, (W) Recharge, (X) Desal-P S, (Y) Desal-other, (Z) Other [P]

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

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

Hyd. lab. data:

Qual. water data; type: COMPLETE [C]

Freq. sampling: INTERMITTENT (11/12/61 [I]; Pumpage inventory: yes no, period:

Aperture cards: yes

Log data: GEOLOGIST-DRILLER'S [GD]

## WELL-DESCRIPTION CARD

SAME AS ON MASTER CARD; Depth well: 2040 ft [2040]; Meas. rept Driller's Log accuracy [3]

Depth cased (first perf.): 1500 ft [1500]; Casing type: STEEL; Diam. 16 in [16]

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

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

Date Drilled: OCT. 1961 [961]; Pump intake setting: ft

Driller: VARNER WELL CO. (name), DUBUQUE, IA. (address)

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 [ ]; Deep [ ] Shallow [D]

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

Descrip. MP: LSD; above/below LSD, Alt. MP 830

Alt. LSD: 830 [830]; Accuracy (source): ALTIMETER [7]

Water Level 148 ft above/below MP; Ft above/below LSD [148]; Accuracy: Driller's Log [D]

Date meas.: OCT. 1961 [061]; Yield: 517 gpm [517]; Method determined

Drawdown: 56 ft [56]; Accuracy: [3]; Pumping period hrs

QUALITY OF WATER DATA: Iron .56 ppm [4]; Sulfate 403 ppm [7]; Chloride 25 ppm [1]; Hard. 465 ppm [7]

Sp. Conduct 1320 K x $10^6$ [5]; Temp. °F; Date sampled 6/15/62 [662]

Taste, color, etc.

Punched ERC — Verified FCH

Well No. 080-14W-23 CBB

Well No. 080-14W-23 CBB

Latitude-longitude 41 (d), 43 (m), 23 (s) N/S 092 (d), 27 (m), 16 (s)

## HYDROGEOLOGIC CARD

SAME AS ON MASTER CARD (1, 19)

Physiographic Province: CENTRAL LOWLAND [1 2] (20, 21) Section: DISSECTED

TILL PLAIN [E] (22) Drainage Basin: IOWA [2 5 D] (23, 25) Subbasin: [ ] (26)

Topo of well site: (D) depression, (C) stream channel, (E) dunes, (F) flat, (H) hilltop, (K) sink, (L) swamp, (Ø) offshore, (P) pediment, (S) hillside, (T) terrace, (U) undulating, (V) valley flat — VALLEY FLAT [V] (27)

MAJOR AQUIFER: CAMBRIAN (system), UPPER (series) [C 3] (28, 29), JORDAN SS. (aquifer, formation, group) [S J] (30, 31)

Lithology: MEDIUM SANDSTONE [3 V] (32, 33) Origin: MARINE [6] (34) Aquifer Thickness: 65 ft

[6 5] (35, 37) Length of well open to: 65 ft [6 5] (38, 40) Depth to top of: 1895 ft [A 9 0] (41, 43)

MINOR AQUIFER: ORDOVICIAN (system), LOWER (series) [Ø 1] (44, 45), PRAIRIE DU CHIEN (aquifer, formation, group) [L P] (46, 47)

Lithology: CHERTY DOL. & SS [Q D] (48, 49) Origin: MARINE [6] (50) Aquifer Thickness: 460 ft

[4 6 0] (51, 53) Length of well open to: 395 ft [3 9 5] (54, 56) Depth to top of: 1435 ft [A 4 4] (57, 59)

Intervals Screened: NONE

Depth to consolidated rock: 78 ft [7 8] (60, 62) Source of data: WELL CUTTINGS [C] (64)

Depth to basement: ft [ ] (65, 68) Source of data: [ ] (69)

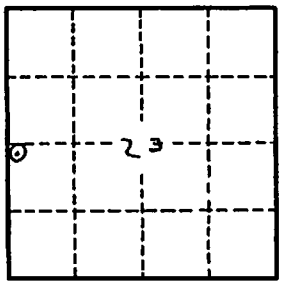
Surficial material: SAND & GRAVEL [R] (70, 71) Infiltration characteristics: GOOD [2] (72)

Coefficient Trans: gpd/ft [ ] (73, 75) Coefficient Storage: [ ] (76, 78)

Coefficient Perm: gpd/ft$^2$; Spec cap: 9.2 gpm/ft; Number of geologic cards: [ ] (79)

CASING:

36" CURB RING 0-10'
26" O.D. CASING 0-78'
20" O.D. CASING 0-355'
18" O.D. LINER 340'-460'.
16" O.D. WALL PIPE 0-330' WITH SWAGE NIPPLE ON BOTTOM.
14" O.D. WALL PIPE 330'-500' WITH SWAGE NIPPLE ON BOTTOM.
10" I.D. PIPE 500'-1500' WITH SHOE ON BOTTOM.




CONTINUOUS STRING OF 16", 14" & 10" PIPE CEMENT GROUTED IN PLACE USING 7700 SACKS OF CEMENT & 15 SACKS OF BENTONITE.

WELL HAS BEEN ACIDIZED - YIELD OF 517 GPM AFTER ACIDIZING. 158 GPM BEFORE ACIDIZING.

Well No. 080-14W-23 CBB

GPO 857-700

W12686

IOWA GEOLOGICAL SURVEY
In Cooperation with U. S. Geological Survey
RECORD OF WELL

Location:

Town: BROOKLYN (NE) (SW) County POWESHIEK

NWNWSW sec. 23 T. 80 N., R. 14 (E) (W) Twp.

Well name and number

Owner BROOKLYN TOWN WELL (1961) Address BROOKLYN, IOWA

Tenant Address

Contractor VARNER WELL CO. Address DUBUQUE, IOWA

Drillers

Drilling dates JAN. 27 — OCT. 19, 1961

Well data:
Altitudes: Drilling curb feet; Land surface feet 830'±

Determined by

Topographic position

Total depth: Reported 2040' feet; Measured feet

Drilling method ROTARY 0-120' - CABLE tools 120' - 2040'

Hole and casing data
36" CURB RING 0-10'
26" OD CSG. 0-78'
20" OD CSG. 0-355
15" LINER FROM 340'-460' - WITH SHOES TOP AND BOTTOM
16" WALL PIPE 0-330' WITH 16" X 14" SWAGE NIPPLE ON THE BOTTOM
14" WALL PIPE FROM 330'-500' WITH 14" X 10" SWAGE NIPPLE ON THE BOTTOM
10" I.D. PIPE FROM 500'-1500' WITH SHOE AT TOP AND BOTTOM
CONTINUOUS STRING OF 16", 14", AND 10" PIPE CEMENT GROUTED IN PLACE USING 7,700 SACKS OF CEMENT AND 15 SACKS OF BENTONITE

Original depth to water ft. above/below Date

Source of data

Sources of water: Principal PRAIRIE DU CHIEN, JORDAN, ST. LAWRENCE

Others

## PRODUCTION DATA

Date

Static water level 148'

Pumping water level 204'

Yield (g.p.m.) 517 AFTER ACIDIZATION

Measuring point

Duration of pumping 48 HOURS

Specific capacity

TL4-249, 250, 251, 252, 253, 254

## LABORATORY DATA

Well No. W12686 Sample range 0'-2040 No. of samples

No. of dupls. and cond. Washed range 130'-2040'

Samples prepared by Date

Logged by NORTHUP-KOCH Date 1961

Correlations by " " Date 1961

W-12686

DATE STARTED January 27, 1961 DATE COMPLETED Oct. 19, 1961

TOTAL DEPTH 2040'

LOCATION Brooklyn, Iowa

DIAMETERS: Hole 10' deep for 36" curb ring.
28" hole to 78'
25" hole to 355'
19¾" hole to 1158'
15¾" hole to 1505'
10" hole to 2040'

CASING RECORD:
36" curb ring to 10'
26" O.D. pipe surface to 78'
20" O.D. pipe surface to 355'
18" O.D. 1/4" wall liner from 340' to 460' with shoes top and bottom.
16" O.D. liner from 882' to 1158'7" with shoes top and bottom.
16" O.D. 3/8" wall pipe surface to 330' with 16" x 14" swage nipple on the bottom.
14" O.D. 3/8" wall pipe from 330' to 500' with 14" x 10" swage nipple on the bottom.
10" I.D. pipe from 500' to 1500' with shoe on the bottom.
Continuous string of 16", 14" & 10" pipe cement grouted in place using 7,700 sacks of cement and 15 sacks of bentonite.

STRATA RECORD

| From | To | Thickness | Description of Beds |
|---|---|---|---|
| 0 | 10 | 10 | No record |
| 10 | 78 | 68 | Clay, gravel, rock & small boulders |
| 78 | 81 | 3 | Yellow rock or lime & brown lime |
| 81 | 92 | 11 | Brown lime |
| 92 | 95 | 3 | Brown & white lime |
| 95 | 97 | 2 | Dark brown lime-hard, crevices |
| 97 | 99 | 2 | Light brown lime-solid |
| 99 | 101 | 2 | Gray sandstone-mixed with little rock |
| 101 | 102 | 1 | Light putty-like sandstone |
| 102 | 106 | 4 | Light sandstone-streak of clay |
| 106 | 108 | 2 | Green shale |
| 108 | 111 | 3 | Sandstone & shale |
| 111 | 121 | 10 | Hard brown lime- |
| 121 | 127 | 6 | Sand, gravel & lime |
| 127 | 130 | 3 | Sand, gravel & clay |
| 130 | 134 | 4 | Brown lime & blue shale |
| 134 | 137 | 3 | Blue & gray shale |

CITY WELL NO. 5 BROOKLYN, IOWA

| From | To | Thickness | Description of Beds |
|---|---|---|---|
| 137 | 143 | 6 | Gray shale & lime |
| 143 | 150 | 7 | Gray shale |
| 150 | 154 | 4 | Blue & green shale |
| 154 | 161 | 7 | Shale |
| 161 | 167 | 6 | Shale & gravel |
| 167 | 176 | 9 | Blue Gray shale |
| 176 | 199 | 23 | Gray shale |
| 199 | 200 | 1 | Brown shale |
| 200 | 203 | 3 | Brown & green shale |
| 203 | 206 | 3 | Brown shale |
| 206 | 209 | 3 | Brown & blue shale |
| 209 | 232 | 23 | Brown shale |
| 232 | 245 | 13 | Gray shale |
| 245 | 246 | 1 | Gray & brown shale |
| 246 | 283 | 37 | Gray & brown shale |
| 283 | 285 | 2 | Gray & brown shale |
| 285 | 293 | 8 | Gray shale |
| 293 | 295 | 2 | Blue & brown shale |
| 295 | 297 | 2 | Blue shale |
| 297 | 299 | 2 | Blue gray shale |
| 299 | 301 | 2 | Blue shale & lime |
| 301 | 305 | 4 | Blue lime |
| 305 | 307 | 2 | Blue lime-some white |
| 307 | 329 | 22 | Blue lime |
| 329 | 332 | 3 | Blue shale-some lime |
| 332 | 334 | 2 | Blue lime-rotten |
| 334 | 338 | 4 | Blue shale & lime |
| 338 | 342 | 4 | Blue gray shale |
| 342 | 345 | 3 | Blue lime & blue gray shale |
| 345 | 353 | 8 | Blue lime |
| 353 | 357 | 4 | Blue lime & caving shale |
| 357 | 363 | 6 | Shale & lime |
| 363 | 367 | 4 | Gray shale |
| 367 | 371 | 4 | Gray shale-trace of lime |
| 371 | 395 | 24 | Shale |
| 395 | 397 | 2 | Shale-trace of lime |
| 397 | 405 | 8 | Lime-trace of shale |
| 405 | 414 | 9 | Gray shale |
| 414 | 418 | 4 | Gray shale & lime |
| 418 | 420 | 2 | Gray & brown lime |
| 420 | 424 | 4 | Lime & shale |
| 424 | 426 | 2 | Shale |
| 426 | 430 | 4 | Shale & lime |
| 430 | 436 | 6 | Brown & blue shale |
| 436 | 440 | 4 | Gray shale & lime |
| 440 | 444 | 4 | Gray & brown lime |
| 444 | 453 | 9 | Brown lime |
| 453 | 461 | 8 | Gray &brown lime |
| 461 | 463 | 2 | Gray lime |
| 463 | 475 | 12 | Brown lime |
| 475 | 477 | 2 | Brown & gray lime |

| From | To | Thickness | Description of Beds |
|---|---|---|---|
| 477 | 480 | 3 | Brown lime |
| 480 | 486 | 6 | Brown & gray lime |
| 486 | 531 | 45 | Brown lime |
| 531 | 533 | 2 | Brown & gray lime |
| 533 | 551 | 18 | Brown lime |
| 551 | 554 | 3 | Brown & gray lime |
| 554 | 562 | 8 | Brown lime |
| 562 | 568 | 6 | Brown & gray lime |
| 568 | 576 | 8 | Gray & white lime |
| 576 | 579 | 3 | Gray lime |
| 579 | 589 | 10 | Brown & gray lime |
| 589 | 596 | 7 | Gray lime |
| 596 | 599 | 3 | Brown lime |
| 599 | 605 | 6 | Brown & gray lime |
| 605 | 643 | 38 | Brown lime |
| 643 | 649 | 6 | Brown & gray lime |
| 649 | 657 | 8 | Brown lime |
| 657 | 661 | 4 | Brown lime & some white rock |
| 661 | 665 | 4 | Brown lime |
| 665 | 676 | 11 | Brown, gray, black & white lime |
| 676 | 679 | 3 | Chert & shale cavings |
| 679 | 682 | 3 | Chert |
| 682 | 699 | 17 | Chert & lime |
| 699 | 703 | 4 | White chert |
| 703 | 707 | 4 | Chert & lime |
| 707 | 709 | 2 | Chert & White lime |
| 709 | 716 | 7 | Chert & brown lime |
| 716 | 723 | 6 | Chert & white lime |
| 723 | 727 | 4 | Chert & trace of brown lime-coarse |
| 727 | 731 | 4 | Brown lime-hard |
| 731 | 732 | 1 | Chert & lime |
| 732 | 736 | 4 | White chert |
| 736 | 737 | 1 | Brown lime & glass rock |
| 737 | 741 | 4 | Brown lime & black specks |
| 741 | 743 | 2 | Chert & brown lime |
| 743 | 746 | 3 | Gray & brown lime |
| 746 | 756 | 10 | Brown lime |
| 756 | 758 | 2 | Brown, white & black lime |
| 758 | 770 | 12 | Brown & white lime |
| 770 | 778 | 8 | Brown lime |
| 778 | 785 | 7 | Gray & white lime |
| 785 | 787 | 2 | Gray lime |
| 787 | 789 | 2 | Brown & gray lime |
| 789 | 823 | 34 | Gray lime |
| 823 | 828 | 5 | Gray & brown lime |
| 828 | 837 | 9 | Gray lime |
| 837 | 853 | 16 | Gray & brown lime |
| 853 | 886 | 33 | Gray lime |
| 886 | 890 | 4 | Gray & brown lime & green shale |
| 890 | 905 | 15 | Blue-green shale & lime |
| 905 | 909 | 4 | Gr[illegible] shale |

| From | To | Thickness | Description of Beds |
|---|---|---|---|
| 477 | 480 | 3 | Brown lime |
| 480 | 486 | 6 | Brown & gray lime |
| 486 | 531 | 45 | Brown lime |
| 531 | 533 | 2 | Brown & gray lime |
| 533 | 551 | 18 | Brown lime |
| 551 | 554 | 3 | Brown & gray lime |
| 554 | 562 | 8 | Brown lime |
| 562 | 568 | 6 | Brown & gray lime |
| 568 | 576 | 8 | Gray & white lime |
| 576 | 579 | 3 | Gray lime |
| 579 | 589 | 10 | Brown & gray lime |
| 589 | 596 | 7 | Gray lime |
| 596 | 599 | 3 | Brown lime |
| 599 | 605 | 6 | Brown & gray lime |
| 605 | 643 | 38 | Brown lime |
| 643 | 649 | 6 | Brown & gray lime |
| 649 | 657 | 8 | Brown lime |
| 657 | 661 | 4 | Brown lime & some white rock |
| 661 | 665 | 4 | Brown lime |
| 665 | 676 | 11 | Brown, gray, black & white lime |
| 676 | 679 | 3 | Chert & shale cavings |
| 679 | 682 | 3 | Chert |
| 682 | 699 | 17 | Chert & lime |
| 699 | 703 | 4 | White chert |
| 703 | 707 | 4 | Chert & lime |
| 707 | 709 | 2 | Chert & White lime |
| 709 | 716 | 7 | Chert & brown lime |
| 716 | 723 | 6 | Chert & white lime |
| 723 | 727 | 4 | Chert & trace of brown lime-coarse |
| 727 | 731 | 4 | Brown lime-hard |
| 731 | 732 | 1 | Chert & lime |
| 732 | 736 | 4 | White chert |
| 736 | 737 | 1 | Brown lime & glass rock |
| 737 | 741 | 4 | Brown lime & black specks |
| 741 | 743 | 2 | Chert & brown lime |
| 743 | 746 | 3 | Gray & brown lime |
| 746 | 756 | 10 | Brown lime |
| 756 | 758 | 2 | Brown, white & black lime |
| 758 | 770 | 12 | Brown & white lime |
| 770 | 778 | 8 | Brown lime |
| 778 | 785 | 7 | Gray & white lime |
| 785 | 787 | 2 | Gray lime |
| 787 | 789 | 2 | Brown & gray lime |
| 789 | 823 | 34 | Gray lime |
| 823 | 828 | 5 | Gray & brown lime |
| 828 | 837 | 9 | Gray lime |
| 837 | 853 | 16 | Gray & brown lime |
| 853 | 886 | 33 | Gray lime |
| 886 | 890 | 4 | Gray & brown lime & green shale |
| 890 | 905 | 15 | Blue-green shale & lime |
| 905 | 909 | 4 | Gray shale |

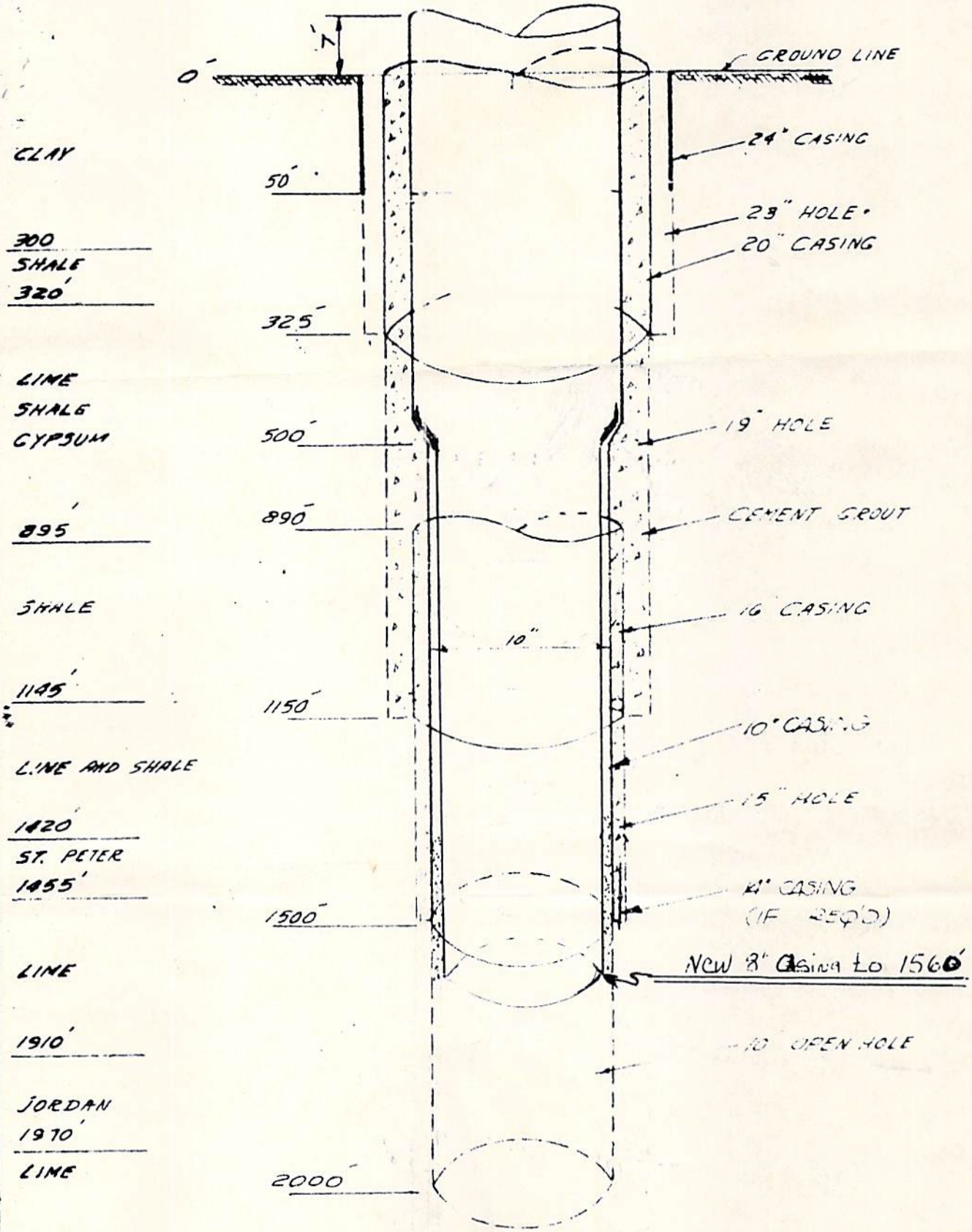
| From | To | Thickness | Description of Beds |
|---|---|---|---|
| 1344 | 1359 | 15 | Brown lime & shale |
| 1359 | 1380 | 21 | Limestone |
| 1380 | 1408 | 28 | Lime & shale |
| 1408 | 1413 | 5 | Lime, shale & sand |
| 1413 | 1438 | 25 | White sand |
| 1438 | 1444 | 6 | Sandy lime |
| 1444 | 1448 | 4 | Lime & shale |
| 1448 | 1455 | 7 | Lime & chalk |
| 1455 | 1461 | 6 | Lime-hard |
| 1461 | 1464 | 3 | Lime & chert-hard |
| 1464 | 1471 | 7 | Lime |
| 1471 | 1477 | 6 | Lime & shale |
| 1477 | 1505 | 28 | Lime |
| 1505 | 1509 | 4 | Brown lime-hard |
| 1509 | 1519 | 10 | Gray lime |
| 1519 | 1530 | 11 | Gray lime & chert |
| 1530 | 1538 | 8 | Whitechalky lime |
| 1538 | 1548 | 10 | Lime, chert & shale |
| 1548 | 1557 | 9 | Gray lime |
| 1557 | 1562 | 5 | Lime, chert & shale |
| 1562 | 1565 | 3 | Lime & chert |
| 1565 | 1584 | 19 | Limestone |
| 1584 | 1605 | 21 | Fine brown lime |
| 1605 | 1618 | 13 | Gray lime |
| 1618 | 1652 | 34 | Sand & lime |
| 1652 | 1673 | 21 | Sandstone |
| 1673 | 1689 | 16 | Limestone |
| 1689 | 1699 | 10 | Limestone & chert |
| 1699 | 1709 | 10 | Gray lime |
| 1709 | 1719 | 10 | Lime & chert |
| 1719 | 1744 | 25 | Limestone |
| 1744 | 1756 | 12 | Lime & chert |
| 1756 | 1803 | 47 | Limestone |
| 1801 | 1809 | 6 | Dark lime |
| 1809 | 1812 | 3 | Lime & shale |
| 1812 | 1818 | 6 | Lime |
| 1818 | 1822 | 4 | Dark gray lime |
| 1822 | 1824 | 2 | Lime |
| 1824 | 1830 | 6 | Lime & shale |
| 1830 | 1833 | 3 | Brown lime |
| 1833 | 1844 | 11 | Limestone |
| 1844 | 1850 | 6 | Limestone & sand |
| 1850 | 1862 | 12 | Clakky lime |
| 1862 | 1918 | 56 | Sandy lime |
| 1918 | 1950 | 32 | Sandstone |
| 1950 | 1954 | 4 | Sandy lime |
| 1954 | 1962 | 8 | Lime & sandstone |
| 1962 | 1974 | 12 | Dark sandy lime |
| 1974 | 1994 | 20 | Dark lime |
| 1994 | 2035 | 41 | Dark graylime |
| 2035 | 2040 | 5 | Dark lime |

STATIC WATER LEVELS

| From | To | Level |
|---|---|---|
| 0 | 115 | None |
| 115 | 436 | 80' |
| 436 | 673 | 90' |
| 673 | 878 | 78' |
| 878 | 969 | 79' |
| 969 | 1105 | 78' |
| 1105 | 1196 | 82' |
| 1196 | 1213 | 135' |
| 1213 | 1297 | 136' |
| 1297 | 1367 | 143' |
| 1367 | 1470 | 146' |
| 1470 | 1471 | 144' |
| 1471 | 1505 | 146' |
| 1505 | 1557 | None recorded |
| 1557 | 1667 | 142' |
| 1667 | 1709 | 171' |
| 1709 | 1885 | 170' |
| 1885 | 1940 | 172' |
| 1940 | 1984 | 170' |
| 1984 | 2040 | 163' |

20" 379'

Re-casing Record 12-20-84
#5 Well Brooklyn Iowa




1984- 1054'6" of Sch. 40, 8" I.D., butt weld pipe installed from 506' to the 1560' depth. Bottom pipe perforated with 1" dia. holes and 8" casing cemented in from bottom up to the 1440' depth. Hole cleaned to 1981'

Done by Northway Well & Pump Co. Marion Iowa

# VARNER WELL & PUMP CO.

DUBUQUE, IOWA

## WELL TEST DATA SHEET



Job: Brooklyn Well No. 5

Location: Brooklyn, Iowa

Date tested: November 16, 1961

Tested by: Rude, Kuhl & Teal

Dia. of well: 10"

Depth of well: 2040'

Length of airline: 390'

Non-pumping level: 148'

Orifice size: 6" x 5"

Pump used:

Driver: UD 1091 International

Column and shaft: 385' of 8" x 1-15/16"

Bowls: 14 stage 10"

Manufacturer: Peerless

Serial No.:

| TIME | PIZOMETER READING (IN.) | G. P. M. | AIR GAUGE READING (FEET) | PUMPING LEVEL | DRAWDOWN | DISCH. PRESSURE LBS. | DISCH. PRESSURE FEET | TOTAL PUMPING HEAD | TEMP. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | | | 0 | | 0 | | | START OF TEST |
| 7:15PM | Pumping out acid | | | | | | | | | Foamy |
| 11/17/61 12:00 | | | | | | | | | | |
| 12:15AM | Pumping out | | | | | | | | | Gas quit coming |
| | 0 | 0 | 242 | 148 | 0 | | | | | |
| 8:30AM | 29 | 658 | 162 | 228 | 60 | | | | | Brownish color |
| 9:00 | 31 | 682 | 150 | 240 | 92 | | | *pH 5 | | Slightly cloudy |
| 9:30 | 31 | 682 | 150 | 240 | 92 | | | | | |
| 10:00 | 31 | 682 | 150 | 240 | 92 | | | *pH 6 | | |
| 10:30 | 31½ | 688 | 151 | 239 | 91 | | | | | 7.56 gal. p.f.d.d. |
| 11:00 | 31½ | 688 | 151 | 239 | 91 | | | | | |
| | Increased speed | | | | | | | | | |
| 11:20 | 66 | 990 | 87 | 303 | 155 | | | | | |
| 11:40 | 67½ | 1001 | 87 | 303 | 155 | | | | | |
| 12:00 | 67½ | 1001 | 87 | 303 | 155 | | | | 74°F | 6.46 gal. p.f.d.d. |
| 12:15PM | 67½ | 1001 | 87 | 303 | 155 | | | | | |
| | Slowed down | | | | | | | | | |
| 12:30 | 17 | 510 | 183 | 207 | 59 | | | | | |
| 1:00 | 17 | 510 | 185 | 205 | 57 | | | | | 8.95 gal. p.f.d.d. |
| 1:30 | 16½ | 506 | 186 | 204 | 56 | | | | | |

* Litmus paper

# VARNER WELL & PUMP CO.

DUBUQUE, IOWA

## WELL TEST DATA SHEET



Job Brooklyn Well No. 5

Location Brooklyn, Iowa

Date tested November 17, 1961

Tested by Rude, Kuhl, Teal

Dia. of well 10"

Depth of well 2040'

Length of airline 390'

Non-pumping level 148'

Orifice size 6" x 5"

Pump used: Driver UD 1091 International

Column and shaft 385' 8" x 1-15/16"

Bowls 14 stage 10"

Manufacturer Peerless

Serial No.

| TIME | PIZOMETER READING (IN.) | G. P. M. | AIR GAUGE READING (FEET) | PUMPING LEVEL | DRAWDOWN | DISCH. PRESSURE LBS. | DISCH. PRESSURE FEET | TOTAL PUMPING HEAD | TEMP. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| 2:00PM | 0 | 0 | | | 0 | | 0 | | | START OF TEST |
| | Slowed down to 300 gpm | | | | 6" x 4" orifice | | | | | |
| 2:50 | 23 | 305 | 215 | 175 | 27 | | | | | 11.3 gal. p.f.d.d. |
| 3:00 | 22½ | 302 | 217 | 173 | 25 | | | | 73° F | |
| 3:30 | 22½ | 302 | 217 | 173 | 25 | | | | | |
| 4:00 | 22 | 299 | 217 | 173 | 25 | | | pH 7 | | Clear |
| 4:30 | 22 | 299 | 217 | 173 | 25 | | | | | |
| 5:00 | 22½ | 302 | 217 | 173 | 25 | | | | | |
| | Changed to 6" x 5" orifice. Speeded up to 500 gpm | | | | | | | | | |
| 5:30 | 17 | 510 | 187 | 203 | 55 | | | | | |
| 6:00 | 17 | 510 | 187 | 203 | 55 | | | | | |
| 6:30 | 17 | 510 | 186 | 204 | 56 | | | | | |
| 7:00 | 17 | 510 | 186 | 204 | 56 | | | | | |
| 7:30 | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 8:00 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 8:30 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 9:00 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 9:30 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 10:00 | 17½ | 517 | 185 | 205 | 57 | | | | | |

2M 7-56 37620.8

# VARNER WELL & PUMP CO.

DUBUQUE, IOWA

## WELL TEST DATA SHEET



Job: Brooklyn Well No. 5

Location: Brooklyn, Iowa

Date tested: November 17, 1961

Tested by: Rude, Kuhl, Teal

Dia. of well: 10"

Depth of well: 2040'

Length of airline: 390'

Non-pumping level: 148'

Orifice size: 6" x 5"

Pump used:

Driver: UD 1091 International

Column and shaft: 385' 8" x 1-15/16"

Bowls: 14 stage 10"

Manufacturer: Peerless

Serial No.:

| TIME | PIZOMETER READING (IN.) | G. P. M. | AIR GAUGE READING (FEET) | PUMPING LEVEL | DRAWDOWN | DISCH. PRESSURE LBS. | DISCH. PRESSURE FEET | TOTAL PUMPING HEAD | TEMP. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | | | 0 | | 0 | | | START OF TEST |
| 10:30PM | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 11:00 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 11:30 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 12:00 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 11/18/61 12:30 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 1:00 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 1:30 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 2:00 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 2:30 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 3:00 | 17½ | 517 | 185 | 205 | 57 | | | | 73° F | |
| 3:30 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 4:00 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 4:30 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 5:00 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 5:30 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 6:00 | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 6:30 | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 7:00 | 17½ | 517 | 187 | 203 | 55 | | | | | |

2M 7-56 37620.8

# VARNER WELL & PUMP CO.

DUBUQUE, IOWA

## WELL TEST DATA SHEET



Job Brooklyn Well No. 5

Location Brooklyn, Iowa

Date tested November 18, 1961

Tested by Rude, Kuhl, Teal

Dia. of well 10"

Depth of well 2040'

Length of airline 390'

Non-pumping level 148'

Orifice size 6" x 5"

Pump used: Driver UD 1091 International

Column and shaft 385' 8" x 1-15/16"

Bowls 14 stage 10"

Manufacturer Peerless

Serial No.

| TIME | PIZOMETER READING (IN.) | G. P. M. | AIR GAUGE READING (FEET) | PUMPING LEVEL | DRAWDOWN | DISCH. PRESSURE LBS. | DISCH. PRESSURE FEET | TOTAL PUMPING HEAD | TEMP. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | | | 0 | | 0 | | | START OF TEST |
| 7:30 | 17½ | 517 | 187 | 203 | 55 | | | | 73° F | |
| 8:00 | 17½ | 517 ~~152~~ | 187 | 203 | 55 | | | | | |
| 8:30 | 17½ | 517 | 188 | 202 | 54 | 12 | | | | |
| 9:00 | 17½ | 517 | 188 | 202 | 54 | | | | | |
| 9:30 | 17 | 517 | 188 | 202 | 54 | | | | | |
| 10:00 | 17 | 510 | 188 | 202 | 54 | | | | | |
| 10:30 | 17 | 510 | 187 | 203 | 55 | | | | | |
| 11:00 | 17 | 510 | 187 | 203 | 55 | | | | | |
| 11:30 | 17 | 510 | 186 | 204 | 56 | | | | | |
| 12:00 | 17 | 510 | 186 | 204 | 56 | | | | | |
| 12:30PM | 17 | 510 | 185 | 205 | 57 | | | | | |
| 1:00 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 1:30 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 2:00 | 17 | 510 | 184 | 206 | 58 | | | | | |
| 2:30 | 17 | 510 | 184 | 206 | 58 | | | | | |
| 3:00 | 17 | 510 | 184 | 206 | 58 | | | | | |
| 3:30 | 17 | 510 | 184 | 206 | 58 | | | | | |
| 4:00 | 17 | 510 | 184 | 206 | 58 | | | | | |
| 4:30 | 17 | 510 | 185 | 205 | 57 | pH 7 | Hardness 38 | | iron 1 ppm | |

2M 7-66 37620.8.

# VARNER WELL & PUMP CO.

DUBUQUE, IOWA

## WELL TEST DATA SHEET



Job Brooklyn Well No. 5

Location Brooklyn, Iowa

Date tested November 18, 1961

Tested by Rude & Kuhl,

Dia. of well 10"

Depth of well 2040'

Length of airline 390'

Non-pumping level 148'

Orifice size 6" x 5"

Pump used: Driver UD 1091 International

Column and shaft 385' 8" x 1-15/16"

Bowls 14 stage 10"

Manufacturer Peerless

Serial No.

| TIME | PIZOMETER READING (IN.) | G. P. M. | AIR GAUGE READING (FEET) | PUMPING LEVEL | DRAWDOWN | DISCH. PRESSURE LBS. | DISCH. PRESSURE FEET | TOTAL PUMPING HEAD | TEMP. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | | | 0 | | 0 | | | START OF TEST |
| 5:00PM | 17 | 510 | 185 | 205 | 57 | | | | | |
| 5:30 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 6:00 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 6:30 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 7:00 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 7:30 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 8:00 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 8:30 | 17 | 510 | 185 | 205 | 57 | 12 | | | | |
| 9:00 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 9:30 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 10:00 | 17 | 510 | 185 | 205 | 57 | | | | | |
| 10:30 | 17½ | 517 | 185 | 205 | 57 | | | | | |
| 11:00 | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 11:30 | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 12:00 | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 11/19/61 12:30AM | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 1:00 | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 1:30 | 17½ | 517 | 186 | 204 | 56 | | | | | |

# VARNER WELL & PUMP CO.

DUBUQUE, IOWA

## WELL TEST DATA SHEET



Job: Brooklyn Well No. 5

Location: Brooklyn, Iowa

Date tested: November 19, 1961

Tested by: Rude & Kuhl

Dia. of well: 10"

Depth of well: 2040'

Length of airline: 390'

Non-pumping level: 148'

Orifice size: 6" x 5"

Pump used:

Driver: UD 1091 International

Column and shaft: 385' 8" x 1015/16"

Bowls: 14 stage 10"

Manufacturer: Peerless

Serial No.:

| TIME | PIZOMETER READING (IN.) | G. P. M. | AIR GAUGE READING (FEET) | PUMPING LEVEL | DRAWDOWN | DISCH. PRESSURE LBS. | DISCH. PRESSURE FEET | TOTAL PUMPING HEAD | TEMP. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | | | 0 | | 0 | | | START OF TEST |
| 2:00AM | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 2:30 | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 3:00 | 17½ | 517 | 186 | 204 | 56 | | | | | |
| 3:30 | 17½ | 517 | 186 | 204 | 56 | | | | 73° F | |
| 4:00 | 17½ | 517 | 186 | 204 | 56 | | | | | |

Extra Copy
Poweshiek Co.

# GROUND-WATER CONDITIONS AT BROOKLYN, IOWA

The town of Brooklyn is located along U. S. Highway 6 in sections 14 and 23, T. 80 N., R. 14 W., Poweshiek County on the Kansan drift plain, a broad rolling upland prairie with a surface elevation of about 850 feet above sea level. The latest census indicates a population of 1,323 persons. A generalized log of the anticipated underlying rocks down through the St. Lawrence dolomite is outlined in tabular form as follows. All information used in this report is based on available data in the files of the cooperative investigations of the Iowa and U. S. Geological Surveys.

| Formation | Thickness (ft) | Depth Range (ft) |
|---|---|---|
| Quaternary system | | |
| Pleistocene series (glacial drift clay, probably contains some interbedded sand and gravel) | 300± | 0-300± |
| Mississippian system | | |
| Maple Mill shale | 20± | 300±-320± |
| Devonian system | | |
| Lime Creek formation (shale and limestone) | 135 | 320- 455 |
| Cedar Valley formation (limestone and gypsum, may contain trace of gypsum or anhydrite) | 325 | 455- 780 |
| Wapsipinicon formation (dolomite with trace of gypsum or anhydrite) | 50 | 780- 830 |
| Silurian system | | |
| Niagaran dolomite | 65 | 830- 895 |
| Ordovician system | | |
| Maquoketa shale, dolomitic at base | 250 | 895-1145 |

| Formation | Thickness (ft) | Depth Range (ft) |
|---|---|---|
| Ordovician system (contd) | | |
| Galena formation (limestone and dolomite, cherty in lower half) | 210 | 1145-1355 |
| Decorah-Platteville formations (limestone, dolomite and shale) | 65 | 1355-1420 |
| St. Peter sandstone | 35 | 1420-1455 |
| Prairie du Chien formation (dolomite, sandy in upper half, cherty in lower half; thin sandstone near middle) | 455 | 1455-1910 |
| Cambrian system | | |
| Jordan sandstone | 60 | 1910-1970 |
| St. Lawrence dolomite | 200+ | 1970-2170+ |

Some adjustments may be necessary on this forecast owing to local variations in the structure and thickness of the beds. A higher or lower starting elevation will also modify this section to some extent.

The present municipal water supply at Brooklyn is obtained from three wells penetrating the glacial aquifers in the Little Bear Creek area south of town and one new well north of town also completed in glacial sand. The supply from the glacial aquifers has not been entirely satisfactory as regards both quantity and quality of water and the town is interested in the possibilities of a deep well to the Jordan sandstone reservoir.

Although several water-bearing zones probably will occur in the strata overlying the Jordan sandstone, notably the Cedar Valley and Wapsipinicon formations of Devonian age, and the Galena, St. Peter, and upper Prairie du Chien formations of Ordovician age, most data indicate that the water from these aquifers will be rather highly mineralized for municipal use. The production might also be inadequate.

The next promising water bed below the glacial aquifers at Brooklyn appears to be the lower Prairie du Chien-Jordan-St. Lawrence sequence between an estimated depth of 1800 and 2100 feet. Highly productive wells have been completed in this aquifer at Grinnell, North English, and Van Horne in the surrounding area. Grinnell city well No. 7 reportedly is capable of pumping 1000 g. p. m. This well originally extended into the Mt. Simon sandstone at 2970 feet, but was later plugged back to 2550 feet just below the St. Lawrence dolomite. The North English well was reported to yield 450 g. p. m. with 20 feet of drawdown indicating much larger yields probably could be developed. The Van Horne well was not as good a producer as expected, yielding only 270 g. p. m. with 92 feet of drawdown. Generally the best results are obtained in wells in which the casing extends from the surface for a considerable distance below the base of the St. Peter sandstone to shut out all overlying aquifers containing highly mineralized water. If necessary acidizing the water beds may appreciably increase the yield. The non-pumping water level of the Jordan sandstone and associated rocks is estimated to be 100 feet below the surface at Brooklyn. The temperature of the water should be between 70 and 72° F. Mineral analyses indicate the water to be acceptable for drinking and other domestic uses. Several analyses are given on a separate sheet appended to this report.

PJH 8/58

IOWA GEOLOGICAL SURVEY
TABULATION OF WATER ANALYSIS
(Dissolved constituents in parts per million)

| Town - Well No<br>Owner | Date of coll. | Depth (ft.) | Geol. source | °F | Diss. solids | Fe | Mn | Ca | Mg | K | Na | $CO_3$ | $HCO_3$ | $SO_4$ | Cl | F | $NO_3$ | Hardness cal. as $CaCO_3$ tot. | carb. | non carb | pH | Micro-mhos at 25° C Cond |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brooklyn town No. 1 (1937) | 5/57 | 31 | sd & gr | | 1070 | .16 | .43 | 163 | 42 | 3.0 | 92 | 0 | 273 | 161 | 261 | 0.2 | 8.4 | 581 | 224 | 357 | 7.6 | 1420 |
| Brooklyn town No 4 (1956) | 10/56 | 260 | " | | 565 | .70 | .05 | 57 | 26 | 6.0 | 115 | 0 | 427 | 137 | 3.0 | 0.6 | .44 | 249 | 249 | 0 | 7.8 | 868 |
| Grinnel city No. 6 | 1/57 | 2498 | Jordan St Law | 72 | 868 | .30 | .05 | 92 | 41 | 21 | 145 | 0 | 354 | 360 | 27 | 1.4 | 5.7 | 399 | 290 | 109 | 7.6 | 1300 |
| North English (1947) | 5/58 | 1940 | Jordan | | 1230 | 3.1 | .05 | 112 | 54 | 22 | 188 | 0 | 298 | 607 | 40 | 1.3 | .44 | 502 | 244 | 258 | 7.4 | 1640 |
| Van Horne town (1955) | 2/56 | 1870 | PrduCh Jordan | 56* | 751 | 0.8 | 0 | 88 | 41 | 15 | 84 | 0 | 349 | 291 | 13 | 1.2 | 0 | 389 | 286 | 103 | 7.7 | 1100 |

NOTES:

= less than

* = seems low, but Galena formation was left uncased in this well and may be contributing to supply ??

Poweshiek County

April 7, 1961

TO: Dr. H. G. Hershey
FROM: Richard C. Northup
SUBJECT: Trip to Brooklyn and Dysart

The writer made a trip to Brooklyn and Dysart to pick up samples from the new city wells being drilled by Varner Well Company of Dubuque. Drilling at Brooklyn has reached a depth of 245' in the Maple Mill shale, and they have made very slow progress, having had trouble with a crooked hole and other difficulties. 26" surface casing was set at 80' and they are now drilling ahead with a 24" hole.

October 17, 1961

MEMO

TO: Dr. H. G. Hershey
FROM: Donald L. Koch
RE: Brooklyn City well

I met Leo Belvel, construction engineer for Brown Engineering at the site of the Brooklyn well in the morning. He and the driller filled me in on the progress made since yesterday.

The present depth is 1994'. Upon examination of the cuttings, the top of the St. Lawrence was placed at 1970'. This would put them only 30' into the St. Lawrence upon completion of the well to the contracted depth of 2000'. I recommended that the well be continued to a depth of 2040' in order to better utilize the water in the top of the St. Lawrence. After conferring with Haven by telephone the recommendation was presented to E. L. Montgomery of the city council, who, in turn, conferred with the other members of the council, and all agreed to extend the depth to 2040'.

They expect to be ready for a pumping test on the 24th or 25th of next week. I stated that you would probably send someone over for the test, and that a water sample would definitely be desirable. The water level was 172' on the 16the and raised to 162' on the 17th.

I brought back the cuttings from 1675'-1985' today, and will study them closer when they are ready to be logged.

Dr. Brown asked me to check and find out just where the circulation was lost, and the driller said between 1250'-1300', which would be in the Prosser. They used 7,600 bags of cement to seal the casing before drilling could be resumed.

Noted HGH 10/20/61

G-W file
Brooklyn (Poweshiek)

October 26, 1961

MEMO

TO: Dr. H. G. Hershey
FROM: Richard C. Northup
RE: Brooklyn town well

Mr. George Havens, Brown Engineering Company, Des Moines, phoned on Thursday morning. He reported that drilling is completed at Brooklyn at 2040' (or 75' into the St. Lawrence). A pumping test was run, and was somewhat disappointing. The best the well could make without breaking suction was 158 g.p.m. static water level was 162' and pumping level of 393 feet. The pump was set at 395 feet. This is a specific capacity of only .68 of a gallon per foot of drawdown, which is very poor for a Jordan well.

393
162
231

Mr. Havens inquired about the advisability of acidizing the well. Without making any guarantee what an acid job would do I showed him how acidizing helped a number of deep wells such as Indianola, Fairfield, Moulton, and Toledo, and Mr. Havens seems pretty sure that they will want to try it at Brooklyn. However, the town of Brooklyn is in a rather bad financial state as the well has cost a lot more than had originally been expected. Cost to date has been $81,000 according to Mr. Havens. It seems like a strange contract to have the town stuck for things that go wrong and for a lot of extras, but I guess if they hope to get a good deep water supply they have got to be prepared to pay for it.

MEMORANDUM OCT. 26, 1961

TO DR. H. G. HERSHEY

FROM RICHARD C. NORTHUP

RE BROOKLYN TOWN WELL

MR. GEORGE HAVENS, BROWN ENGINEERING CO., DES MOINES, PHONED ON THURSDAY MORNING. HE REPORTED THAT DRILLING IS COMPLETED AT BROOKLYN AT 2040' (OR 75' INTO THE ST. LAWRENCE). A PUMPING TEST WAS RUN, AND WAS SOMEWHAT DISAPPOINTING. THE BEST THE WELL COULD MAKE WITHOUT BREAKING SUCTION WAS 158 G.P.M. STATIC WATER LEVEL WAS 162' AND PUMPING LEVEL OF 393 FEET. THE PUMP WAS SET AT 395 FEET. THIS IS A SPECIFIC CAPACITY OF ONLY .68 OF A GALLON PER FOOT OF DRAWDOWN, WHICH IS VERY POOR FOR A JORDAN WELL.

MR. HAVENS INQUIRED ABOUT THE ADVISEABILITY OF ACIDIZING THE WELL. WITHOUT MAKING ANY GUARANTEE WHAT AN ACID JOB WOULD DO, I SHOWED HIM HOW ACIDIZING HELPED A NUMBER OF DEEP WELLS SUCH AS INDIANOLA, FAIRFIELD, MOULTON, AND TOLEDO, AND MR. HAVENS SEEMS PRETTY SURE THAT THEY WILL WANT TO TRY IT AT BROOKLYN. HOWEVER THE TOWN OF BROOKLYN IS IN A RATHER BAD FINANCIAL STATE AS THE WELL HAS COST A LOT MORE THAN HAD ORIGINALLY BEEN EXPECTED. COST TO DATE HAS BEEN $81,000 ACCORDING TO MR. HAVENS. IT SEEMS LIKE A STRANGE CONTRACT TO HAVE THE TOWN STUCK FOR THINGS THAT GO WRONG AND FOR A LOT OF EXTRAS, BUT I GUESS IF THEY HOPE TO GET A GOOD DEEP WARTER SUPPLY THEY HAVE GOT TO BE PREPARED TO PAY FOR IT.

# VARNER WELL AND PUMP CO. *Established 1906*

WATER WELLS - DEEP WELL PUMPS - WELL REPAIRS - SOUNDINGS

*Contractors*

POST OFFICE BOX 237—TEL. DUBUQUE 3-8226
222 EAST FOURTH STREET
DUBUQUE, IOWA


November 30, 1961

Iowa Geological Survey
Geology Annex
Iowa City, Iowa

Gentlemen,

We enclose herewith a copy of the "well drawdown curve" for No. 5 well at Brooklyn, Iowa.

The curve shows the production of the well prior to acidizing and the production after the acidizing.

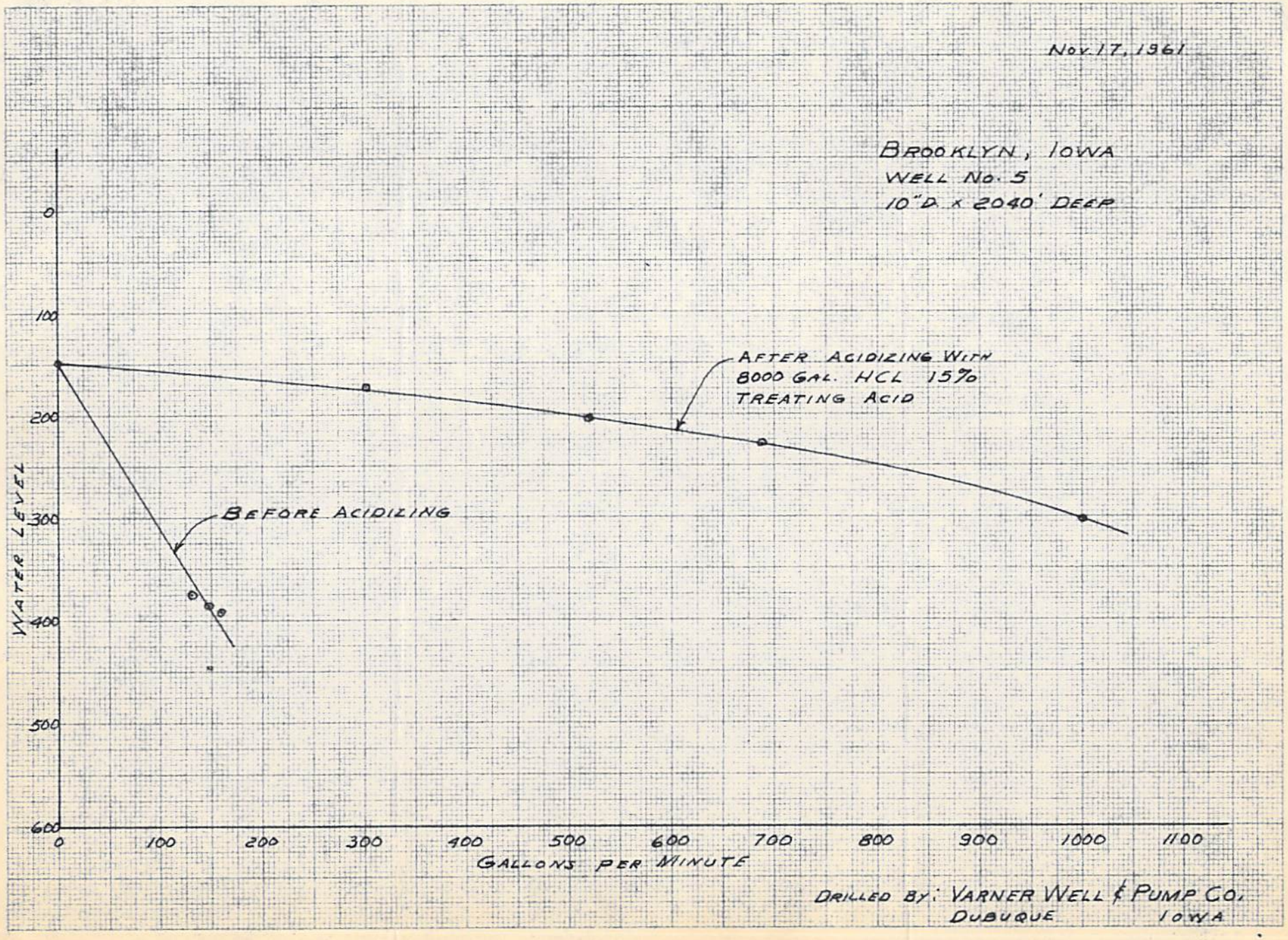
Trusting this information will be of value to you, we remain

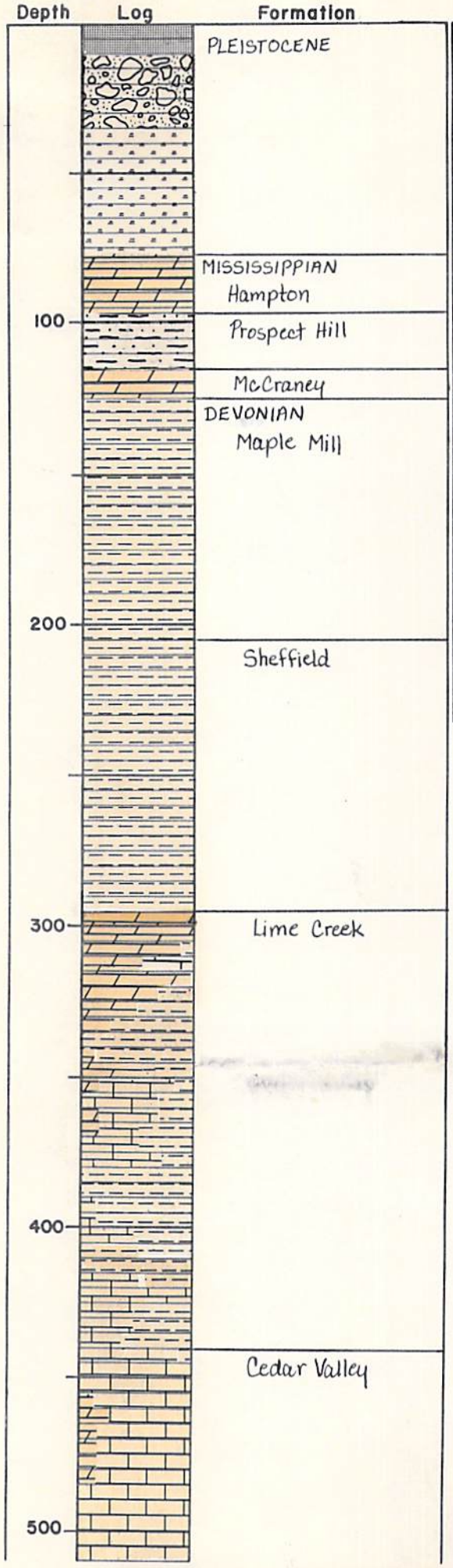
Yours very truly
VARNER WELL & PUMP CO.

E. C. Teal

E. C. Teal
President

ECT:rb



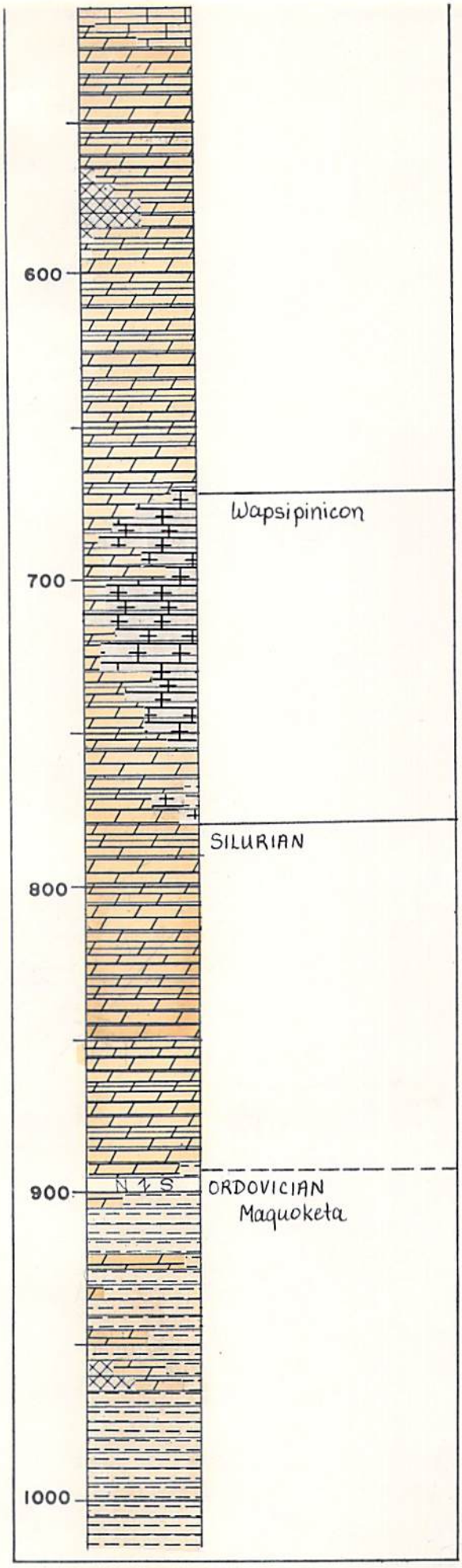



**IOWA GEOLOGICAL SURVEY**
**In Cooperation with**
**U. S. GEOLOGICAL SURVEY**
**Iowa City, Iowa**

| | |
|---|---|
| **Name** Brooklyn City Well #5 (1961) | **State** Iowa |
| **Town** Brooklyn **County** Poweshiek | **Loc.** NW NW SW |
| **Contractor** Varner Well Co. **Driller** | **Sec.** 23 |
| **Drilling Dates** Jan. 27, 1961 - Oct. 20, 1961 | **T.** 80 **N., R.** 14 W. |
| **Casing Record** 36" curb ring 0-10'<br>26" OD csg. 0-78'<br>20" OD csg. 0-355'<br>18" OD liner 340-460'<br>16" OD liner 882-1158' 7"<br>16" OD Wall pipe 0-330' with swage nipple on bottom.<br>14" OD Wall pipe 330-500' with swage nipple on bottom.<br>10" ID pipe 500-1500' with shoe on bottom | |
| **S.W.L.** 148' **G.P.M.** 517 (after acidization) **D.D.** 56<br>Main water: Prairie de Chien, Jordan, St. Lawrence. | |
| **Remarks** Continuous string of 16", 14", + 10" pipe cement grouted in place using 7700 sacks of cement + 15 sacks of Bentonite. | **Elev.** 830<br>**T.D.** 2040 |
| **Logged By** Northup 1961 | **I.G.S. No.** W-12686 |

**Explanation of Colors**

- Drift
- Sand & Gravel
- Shale
- Sandstone
- Limestone
- Dolomite
- Chert
- Soil
- Siltstone
- N+S No Samples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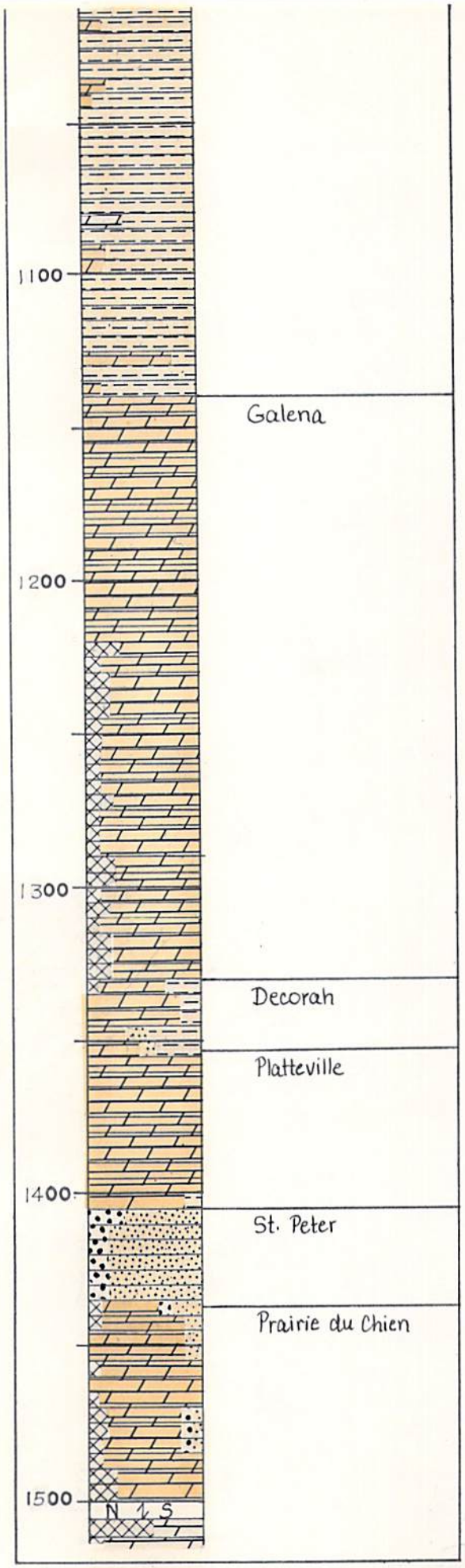
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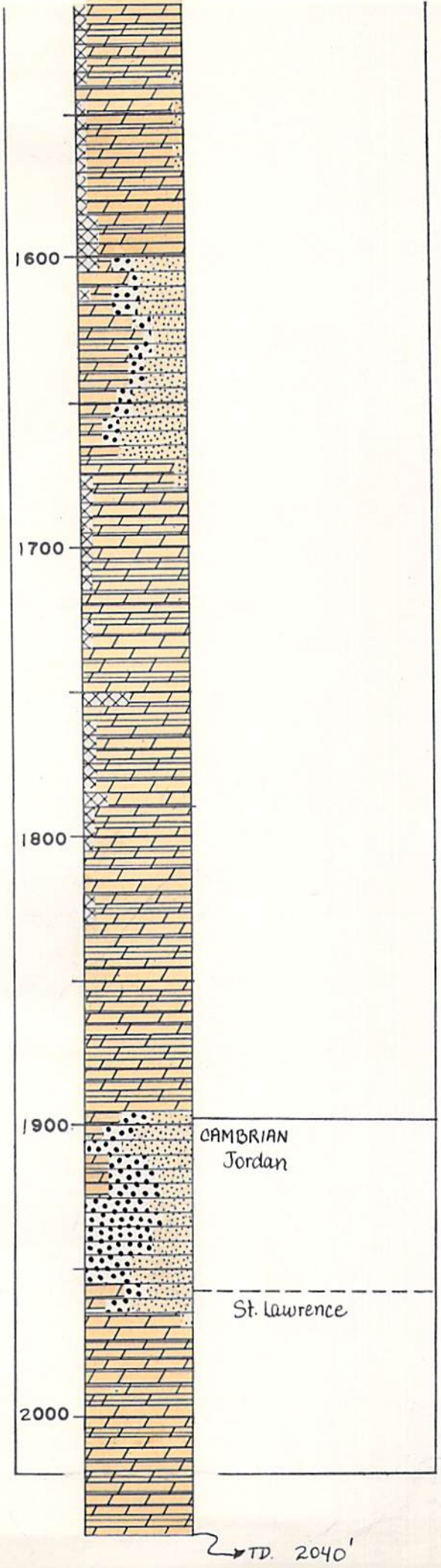
St. Peter
Prairie du Chien
N ½ S


1600
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1800
1900
2000
CAMBRIAN
Jordan
St. Lawrence
TD. 2040'