

W1578

Iowa Department of Natural Resources

Abandoned Water Well Plugging Record

1. Owner: _____ PWTS Well Number: _____

Name: MHI/City Water Department City: Independence State: Iowa

Address: 331 1st Street E Zip: 50644 Phone: (319) 334-2780

If this was a Public Water Supply Well, please provide:

PWSID Name: _____ PWSID Number: Geosan #1578

2. Well (Cistern) Location:

NW 1/4 of, NW 1/4 of, SW 1/4 of, Section 8, Twp. 88 N, Range 9 West East (circle one)

Buchanan County, Describe well location on property: West of 230th St.

GPS Well Location: Latitude W 91° 55.668 Longitude N 42° 27.325

3. Description:

Well depth: 352 ft. Casing material: steel, plastic, concrete, clay, brick, stone (circle one)

Depth to water: 70 ft.

Casing diameter: 12 in. Type of construction: drilled, driven, bored, dug, augered (circle one)

Year or decade constructed: 1942 (circle one)

Depth of casing: 162 ft. Check if this is a Monitoring Well Well ID _____

Check if Cistern depth: _____ ft. diameter: _____ ft.

I certify this well has been plugged as required by rule 567-39.8 of the Iowa Administrative Code (IAC). I agree to provide any additional information the county or department may need concerning this well.

Signature of Owner: Tim Donnelly Date Plugged: 1980's

If plugged by certified well contractor, complete this box

I have plugged this well as required by rule 567-39.8 of the Iowa Administrative Code (IAC).

Signature of Contractor: City of Independence Cert. No. _____

OR, If plugged by well owner, complete this box:

The property owner has plugged this well following requirements in rule 567-39.8 of the Iowa Administrative Code with the oversight and assistance of the designated county agent.

Signature of County Agent: _____ Date Approved: _____

Eligible for Grants-to-Counties cost share: YES NO (Private Wells Only - Determined by County Agent)

Complete one form for each well plugged and submit within 30 days to the local county agent: _____ or, only if no county agent is available, to:

Water Supply Section
Iowa Department of Natural Resources
 401 SW 7th Street, Suite M
 Des Moines, IA 50309-4611



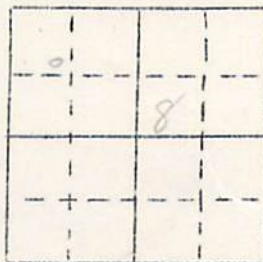
IOWA GEOLOGICAL SURVEY
In Cooperation with U. S. Geological Survey

W-1578

RECORD OF WELL

Location:

Town: Independence (EE)
(1 S 2 W); County Buchanan
SE-NW-NW sec. 8 T. 22 N., R. 9 W. Summer Twp.



Well name and number Independence State Hospital

Owner _____ Address _____

Tenant _____ Address _____

Contractor Charles D. Nolan Address Cedar Rapids

Drillers J. E. Griffith

Drilling dates Nov. 14, 1941 to August 1942

Well data:

Elevations: Drilling curb 981 feet; Land surface 980 feet

Determined by _____

Topographic position Upland slope

Total depth: Reported 351 feet, Measured 352 feet

Drilling method Cable

Hole and casing data 8' of 30" casing surface to 8' 127'3" of 24" casing 1'3" to 128'6" 11'6" of 12" casing 1' to 162'6" to be cemented between 12" & 24" casings
(Give amount, size, kind, and depth of all casing; type and position of seals and packers; cementing; how finished--perforated pipe, screen, gravel pack, open hole, etc.)

Original depth to water 82 ^{above} ft. below _____ Date _____

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

Sources of water: Principal 212; Others _____

Production data: Date _____
 Static depth to water 82' Measuring point _____
 Pumping level 122 at 280 g.p.m.
11 9 1/2 200-215
 Specific capacity 7 g.p.m. per ft. drawdown; Temperature 51 1/4 °F.

Pump data; Type pump Turbine Column Dia. 5" Length 148
 Cylinder or bowls: Dia. 8 Length 6 Suction pipe 0
 Power Belt driven by Farmall tractor Airline 140
 Estimated rate of production: _____ g.p.m. for _____ hrs. a day
 Use of water Public Drinking; Industrial

WATER ANALYSES (in parts per million)

Date sampled	<u>Aug. 24, 1943</u>	<u>March 15, 1944</u>	_____	_____
Sampled by	<u>K. E. A.</u>	<u>C. L. Rigby for H. G. H.</u>	_____	_____
Total solids	<u>246</u>	<u>214</u>	_____	_____
Insoluble matter	<u>20.5</u>	<u>13.5</u>	_____	_____
Alkalinity (Meo)	<u>196.0</u>	<u>196.0</u>	_____	_____
Alkalinity (Phn)	<u>0.0</u>	<u>0.0</u>	_____	_____
pH	<u>7.4</u>	<u>7.6</u>	_____	_____
Fe ₂ O ₃ + Mn ₂ O ₃ + Al ₂ O ₃	<u>6.0</u>	<u>0.5</u>	_____	_____
Alkali as sodium	<u>3.0</u>	<u>12.4</u>	_____	_____
Calcium	<u>42.8</u>	<u>54.7</u>	_____	_____
Magnesium	<u>29.7</u>	<u>12.7</u>	_____	_____
Iron (unfiltered)	<u>0.7</u>	<u>0.16</u>	_____	_____
Manganese	<u>0.00</u>	<u>0.00</u>	_____	_____
Nitrate	<u>0.13</u>	<u>0.18</u>	_____	_____
Fluoride	<u>0.5</u>	<u>0.0</u>	_____	_____
Chloride	<u>2.0</u>	<u>1.0</u>	_____	_____
Sulfate	<u>27.4</u>	<u>9.5</u>	_____	_____
Bicarbonate	<u>241.1</u>	<u>239.1</u>	_____	_____
Hardness (ppm)	<u>230</u>	<u>189</u>	_____	_____
Hardness (gpg)	<u>13.4</u>	<u>11.1</u>	_____	_____

Remarks _____

Laboratory data: Sample storage location _____
 Sample range 0-350 No. spls. 76 No. dupls. & cond. 76 Cond.
 Spls. prepared by Harris Washed range _____ by _____
 Driller's log and cond. yes-fair
 Insoluble residues: Prepared by _____ Studied by _____ Strip log _____
 Microscopic study _____ strip log Harris
 Gen. log _____ Correl. by _____

Dear Sir:

In connection with the investigation of the water resources of Iowa, the Geological Survey in endeavoring to secure all the important facts relating to the deep wells of the state. It would be a special favor if you, as the owner of such a well, would fill out the blanks in the following schedule, so far as may be possible, and return this sheet at your earliest convenience in the inclosed addressed envelope. The facts thus obtained will be placed on permanent record and in return for your co-operation it will be our pleasure to send you our full reports when published.

Yours very truly,

W. H. NORTON, Asst. in charge of Artesian Wells.

Locality; Town Independence, Buchanan County, qr. N. W. $\frac{1}{4}$ qr. # 8 sec. tp. ton Washing- R. 88-9

Owner State of Iowa,

Name and address of driller Albin Brimmer, Independence, Iowa.

Depth 160 feet Diameters from top to bottom 9 3/8 "

Date of completion January 3rd 1914 Elevation relative to railway grade at station 921 Feet.
 and 971 feet at well.

Depth at which principal supply of water was found 166 feet.

Depths of other water beds 12 feet.

If a flowing well, how high would water rise above surface in pipe on completion of well?

How high will it rise in pipe at present? Flow in gallons per minute on completion.

Present flow. If a non-flowing well, how near the surface did the water rise on completion 50 feet.

How near the surface does it now rise? 50 feet.

Pumping capacity on completion 100,000 gal. in 24 hrs. at present About 100,000 gal. in 24 hrs.

Depth of cylinder 150 feet. Effect of continuous pumping

on level of water There is none to speak of.

If the flow or pumping capacity has diminished, can you assign cause?

Have you any records to show the heights at which the water stood as the well was being drilled? After shutting off surface water at twelve feet there was no water until rock was struck at 148 feet, at this point the water came to about 100 feet of surface.

Temperature 51 degrees.

Casing: size, length and where placed 9 3/8" 148 feet Inserted screen joint iron casing

Packing: kind and place Not any.

Quality of water, hard, soft, salty, alkaline, iron or sulphur bearing Soft. Very little iron.

Effect on boilers Good.

Effect on health of users Very good.

If you have an analysis of water please place on back of this sheet.

If you have record of the beds passed through, please place it on back of this sheet.

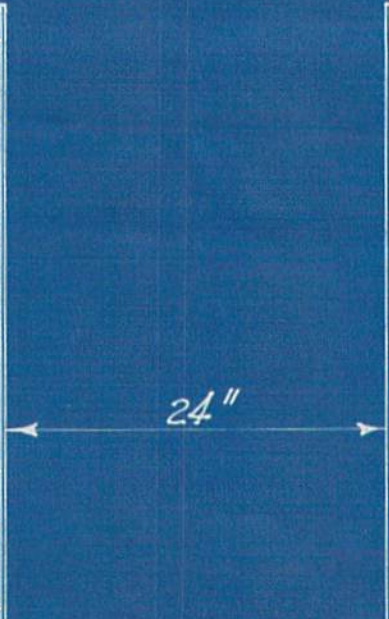
Names of persons who may have samples of drillings Dr. W. P. Crumbacker

Cost of well \$573.00 Cost of pumping machinery \$425.00

NAMES AND ADDRESSES OF OWNERS OF OTHER WELLS RECENTLY DRILLED.

Date 10-9-1915

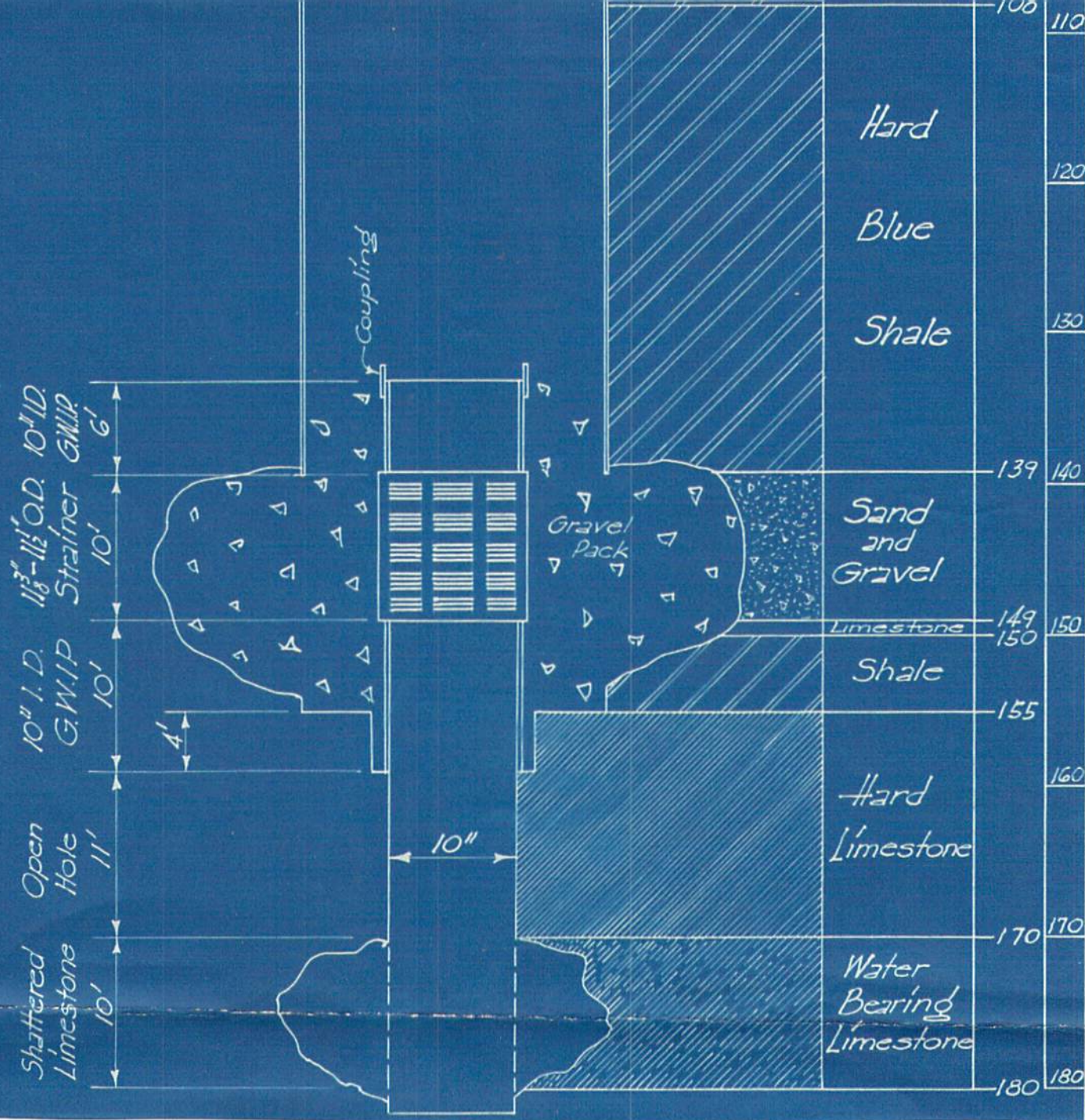
Signed W. P. Crumbacker



Soil	Depth
Soil	0
Yellow Clay	3
	10
	13
Blue Clay	20
	30
	40
	50
	55
Sandy Blue Clay	60
	68
Fine Sand	70
	73
Sandy Clay	80
	85
Black Shale	90
	100

Static W.L.
Present Well

Pumping Level at
420 gpm - Present Well



(COPY)

THORPE BROTHERS WELL CO.
2340 Sixth Avenue
Des Moines, Iowa

Drilled for State Hospital at Independence, Iowa

Drilling started July 6, 1932. Completed August 2, 1932

Well No. 1. Kind of Well, Drilled. Dept, 198'. Size hole started 12½"

Finish 12½" G.P.M. 65. Static head 81' Drawdown 55'

Water was first encountered at 81' in sand. Approximate amount, No test.

Remarks: Top strainer set at 168'; bottom at 188'; 5' of 10" pipe on top of strainer; 10' of 6" pipe on bottom of strainer.

Size Pipe	Amount of pipe	Depth to Bottom of Pipe	Make of Pipe
12½"	165'	165'	California

Driller - A. J. Diemer. From surface to bottom feet.

<u>Amount in Feet</u>	<u>Kind of Soil or Formation</u>	<u>Total Depth Feet</u>
3	Soil	3
15	Yellow clay	18
43	Blue clay	61
20	Sand	81
57	Blue clay	138
12	Sand	150
13	Dark clay with rock	163
25	Limestone	188
10	White shale	198

Independence State Hospital (Buchanan Co.)

WELL NO. 2 (Thorpe Bros. Well Co., Des Moines)

The well has been in use for a number of years prior to the drilling of the present well by C. D. Nolan, of Cedar Rapids.

The well is a patent gravel-pack type, with a main hole and four side holes.

Log of the Main Hole

Soil	0	to	3
Yellow clay	3	to	13
Blue clay	13	to	55
Sandy blue clay	55	to	68
Sand, very fine	68	to	73
Sandy clay	73	to	85
Black shale	85	to	108
Blue shale, hard	108	to	139
Sand and gravel	139	to	149
Lime	149	to	150
Shale	150	to	155
Hard lime	155	to	170
Limestone, water bearing	170	to	180

T.D. 180'

No. 1 side hole; 8" to 93', 6" to 149'

No. 2 side hole; 8" to 93', 6" to 148'

No. 3 side hole; 8" to 93', 6" to 148'

No. 4 side hole; 8" to 95', 6" to 148'

Side holes filled to 120' with gravel and then cemented.

For other information on this well, see water sample data sheet and results of water analysis.

K.E.A.
11-3-42

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

Name of Well Independence State Hospital Survey No. W- 1578
 Location SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 88 N., R. 9 W., Buchanan County
 Drilled by Charles D. Nolan Date started, Nov. 14, 1941
 Total Depth 352 ft. Curb Elevation 981 ft. Static Level 82 ft.
 Pumping Test _____ Hours _____ Min; Gal. per min. _____ Drawdown _____ ft. in _____ min.
 Casing Data 8' of 30" curbing surface to 8' (temp.); 127'3" of 24" casing 1'3" to 128'6"; 161'6" of 12" casing 1' to 162'6" to be cemented between 12" and 24" casings.

No.	<u>Description of Formations</u>	<u>Thick.</u>	<u>From</u> <u>(feet)</u>	<u>To</u>
	Pleistocene system Eldoran series Recent stage			
1.	Soil, brown, sandy, noncalcareous	5	0	5
	Iowan substage			
2.	Clay, mottled yellow and gray, sandy, oxidized and leached	5	5	10
3.	Clay, gray, silty to pebbly, calcareous	5	10	15
4.	Sand, mostly 1- $\frac{1}{2}$ mm. unoxidized, unleached, mostly quartz with some igneous and limestone grains	5	15	20
5.	Clay, gray, calcareous, silty, pebbly	20	20	40
	Loveland interval			
6.	Silt, light drab, angular, slightly calcareous	20	40	60
7.	Sand, mostly 1 to $\frac{1}{2}$ mm., slightly pebbly in upper portion, clean, quartz and igneous material	20	60	80
	Ottumwan series Kansan (?) stage			
8.	Clay, gray, very silty, slightly sandy and pebbly, Notes: calcareous	38 $\frac{1}{2}$	80	118 $\frac{1}{2}$

CC TO Mr. Ralph Arnold, State Architect, Des Moines, October 17, 1942.
 Mr. Chas. D. Nolan, Cedar Rapids, October 17, 1942.

<u>No.</u>	<u>Description</u>	<u>Thick.</u>	<u>From (feet)</u>	<u>To</u>
9.	Clay, brown, sandy, slightly calcareous	$\frac{1}{2}$	118 $\frac{1}{2}$	119
10.	Clay, gray, silty, sandy, calcareous, gypsiferous, with igneous and limestone pebbles	21	119	140
11.	Gravel, mostly 4-2 mm., angular, dolomite, limestone, igneous, and quartz (+ 4 mm. 5%, 4-2 mm. 35%, 2-1 mm. 25%, 1- $\frac{1}{2}$ mm. 20%, $\frac{1}{2}$ - $\frac{1}{4}$ mm. 10%, less than $\frac{1}{4}$ mm. 5%)	5	140	145
12.	Sand, light-colored, very coarse-grained, major grade 2- $\frac{1}{2}$ mm., subangular, quartz, limestone, and chert	10	145	155
Devonian system				
Wapsipinicon formation				
13.	Shale, light gray, dolomitic, slightly silty, dull, structureless	5	155	160
14.	Limestone, yellowish to creamy buff, fine- to medium-grained, granular, slightly dolomitic	5	160	165
Silurian system				
Niagaran series				
Hopkinton formation				
15.	Chert, light drabish to dark gray, slightly yellowish speckled black, conchoidal, dense, to slightly tripolitic. Dolomite 10% to 20%, light drabish yellow, medium-grained, dense, crystalline	10	165	175
16.	Dolomite, light brownish and drabish yellow, fine- to medium-grained, dense to slightly vuggy. Chert 15% to 20%, cream to light buff, somewhat tripolitic and quartzose, dense, slightly pyritic. Quartz sand trace, rounded, frosted	20	175	195
17.	Dolomite, light yellowish gray, medium- to coarse-grained, dense to slightly porous, subsaccharoidal. Chert 10%, white mottled dark gray, subvitreous, dense, conchoidal, opaque, slightly tripolitic	10	195	205
18.	Dolomite, pale drabish gray, medium- to coarse-grained, mostly dense, trace subsaccharoidal, rather porous from 212 to 215 feet. Chert as in 195 to 205 feet, 3% to 5%	10	205	215
19.	Dolomite, very light yellowish buff to gray, medium- to mostly coarse-grained, very slightly porous. Chert 5%, white to dark gray, conchoidal, opaque, to smoky gray translucent, dense	25	215	240

<u>No.</u>	<u>Description</u>	<u>Thick.</u>	<u>From (feet)</u>	<u>To</u>
20.	Dolomite, very light cream to buff, medium- to mostly coarse-grained, crystalline, dense to slightly porous. Chert trace, light to medium gray speckled black by pyrite, waxy, conchoidal, opaque	45	240	285
Alexandrian series Kankakee formation				
21.	Dolomite, light creamy gray to buff, coarse-grained, crystalline, saccharoidal in small part. Chert, white, dull, grainy, trace quartzose veins and crinoid stems	10	285	295
22.	Dolomite, light creamy buff, coarse-grained, crystalline, dense. Chert 30%, white, dull, grainy to conchoidal, dense, opaque	5	295	300
23.	Dolomite, pale drab, medium-grained, crystalline, dense to slightly porous in small part. Chert as in 295 to 300 feet, 20% ranging downward to 5%	20	300	320
24.	Dolomite, very light buff to light drab, fine- to medium-grained, dense to slightly porous in 325 to 330 foot interval. Chert, white mottled medium to dark gray, dull, dense, slightly quartzose, conchoidal to granular, slightly dolomitic and pyritic	10	320	330
25.	Dolomite, light yellowish buff mottled dark drab and gray, fine-grained, crystalline, dense to slightly porous and weathered, pyritic	11	330	341
Ordovician system Maquoketa formation				
26.	Shale, light greenish gray, dolomitic, silty, dull, structureless	11	341	352

IOWA GEOLOGICAL SURVEY
Iowa City, Iowa

DRILLER'S LOG
State Hospital Well No. 3
Independence, Iowa

Contractors: Chas. D. Nolan, Cedar Rapids
 Drillers: J. E. Griffith, Cedar Rapids
 Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 35 N., R. 9 W., Sumner Twp.
 Elevation: 981'
 Static water level: 79.6' below ground level
 Temporary depth: 227' (July 9, 1942)

Casing records: 8' of 30" curbing from surface to 8' (temporary)
 127'3" of 24" casing from 1'3" to 128'6"
 161'6" of 12" casing from 1' to 162'6"
 (To be cemented between 12" and 24" casings)

Main water supply at 212', and in lower portion of well. (From 81' to 212', static water level was 76'. When drilling reached 212', the water level changed rapidly to 81' (July 7, 1942) but recovered to 79.6' by July 9, 1942)

<u>Description</u>	<u>Thickness</u>	<u>From</u> <u>(feet)</u>	<u>To</u>
Dirt	5	0	5
Blue clay	10	5	15
Sand	5	15	20
Blue clay	20	20	40
Blue clay, some water	10	40	50
Gray clay, some water	10	50	60
Clay and gravel	5	60	65
Gravel	1	65	66
Sandy gravel	4	66	70
Sand	10	70	80
Sand and clay	5	80	85
Gray clay	15	85	100
Tuff clay, some water	5	100	105
Tuff clay	13 $\frac{1}{2}$	105	118 $\frac{1}{2}$
Gravel, some water	2	118 $\frac{1}{2}$	119
Tuff sandy clay	1	119	120
Sand and gravel, some water	1	120	121
Tuff sand	4	121	125
Sand and clay	5	125	130
Gray clay black	10	130	140
Sand and gravel	5	140	145
Sand	5	145	150
Sand and lime rock	5	150	155
Blue lime rock	5	155	160
Sand and lime rock	5	160	165
Blue lime rock	45	165	210
Sand rock	2	210	212
Lime rock	15	212	227

IOWA GEOLOGICAL SURVEY
IOWA CITY, IOWA

Results of Pumping Test
State Hospital, Independence, Iowa
August 19, 1942

Location: $32\frac{1}{2}$ NW $14\frac{1}{2}$ sec. 6, T. 38 N., R. 9 W., Banner Twp.
Elevation: 981' (Alt.)
Depth: 391 ft.
Static Level: 82 ft.
Test made after acidizing well

Casing: 24" from 1' to 128' 6"
12" from 1' to 162' 6"
(to be cemented between 24" and 12" casings)

Pump: American Well Works head, pulley drive 6" column and 14" bowls
(8 stage)
Borden (bottom) set at 126 with no suction pipe (meas. below base
of pump which is 1.75 ft. above ground)
Power: 19-ton Case threshing steam engine, owned by Vic Carroll, Gasqueton

Discharge: Measured by manometer in 6" pipe with 5" orifice

Contractor: Charles D. Nolan, Cedar Rapids
Driller: J. H. Griffith, Cedar Rapids

All depth to water measurements by I.C.S. electric line. Measuring point is
E. edge of 30" curbing (temporary) which is even with ground surface and
1.29 ft. above top of 12" casing. (Drillers airline set at 120 ft. below
pump base. Air gage 1' above ground)

TIME	DEPTH TO WATER (ft. below W.P.)	MANOMETER (Inches)	PRODUCTION (G.P.M.)	REMARKS
9:33 a.m.	80.97	(Airline = 39.5)		Static level
9:55	81.84	(airline = 40.5)		Static level
10:15	80.74			Static level
10:21:45				Pump started
10:22:30	86.0			
10:24	88.35			Water mudd
10:25	90.32			
10:26	90.67			Pumping increased
10:27	90.66			
10:29	92.55			
10:30	92.70			
10:35	95.04			Water in man. 34"
10:42	95.70			
10:44	93.70			Clearing cone
10:45	92.55			(Pumping rate still varying)
10:48	92.65			
10:50	94.95			

Est. 150-200 g.p.m.

Results of Pumping Test, Independence State Hospital

TIME	DEPTH TO WATER (Ft. below M.P.)	MANOMETER (Inches)	PRODUCTION (G.P.M.)	REMARKS
11:00	92.13			Temp. = 51 3/4°
11:10				Water more muddy. Pump shut down to adjust belt. Recovery to 77' in 15 sec., then drop back to 81+ in one minute.
11:15	81.22			
11:21	81.11			
11:25	81.05			
11:26				Pump on again
11:27				Pump off
				Well has been pump- ing up some dol. and sand fragments as well as mud.
11:32				Pump on again
11:37	99.05	3 1/2		Still muddy
11:43	97.50	3 5/8		Still muddy, clear- ing
11:45	96.50	3 7/8		
11:51	100.35	4 1/8	250+	
12:22 p.m.	103.96	4	250	Still cloudy. Temp. = 51 1/2°
12:29	104.24	4 1/8	250+	
12:37	111.62	4 7/8	275-	Clearing
12:44	111.46	4 3/4	270	Temp. = 51 1/2° water, air = 82°
12:58				Pump stopped to fix belt
12:59	81.50			
12:59.10				Pump on
1:01	116.12	5 1/2	285+	
1:06	107.50	4 1/8	250+	Clouded again
1:19	111.00	4 1/2	255	Clearing up
1:50	118.35	5 1/2	280	
2:06	111.36	4 1/8	250+	Clear, temp. water = 51 1/2°
2:23	111.05	4 1/2	255	
2:27	113.92	4 1/2	260+	Sample taken 2:35 p.m.
2:39	114.80	4 5/8	270-	
2:50	116.85	5	275	
2:53	117.00	5	275	Water clear
2:59	122.05	5 3/4	290	
3:00	120.19	5 3/8	285-	

Results of Pumping Test, Independence State Hospital

TIME	DEPTH TO WATER (Ft. below M.P.)	MANGMETER (Inches)	PRODUCTION (G.P.D.)	REMARKS
3:02	120.90	5 1/2	280	
3:04	121.32	5 1/2	285+	
3:06	123.35	5 3/4	290	
3:08	123.90	5 3/4	290	
3:10	123.18	5 3/4	290	
3:15	123.31	5 1/2	285+	
3:18	120.72	5 1/8	275+	
3:20	119.98	5	275	
3:25	120.90	5 1/2	280	
3:28	123.01	5 1/2	285+	
3:32	122.17	5 1/2	280	
3:42	125.35	5 3/4	290	
3:44	124.95	5 1/2	285+	
3:58	124.70	5 3/8	280+	
4:02	119.49	4 3/4	270	
4:10				Pump shut down
4:13				Pump on
4:50	122.11	5	275	Water clear
4:53	118.60	4 1/2	260+	
4:58	123.39	5 1/2	285+	
4:59	124.44			
5:00				Pump off
5:01	83.32			Recovery started
5:01.30	83.12			
5:02	83.01			
5:03	82.89			
5:04	82.78			
5:05	82.77			
5:06	82.70			
5:07	82.70			
5:10	82.61			
5:15	82.57			
5:20	82.50			
5:30	82.46			
5:40	82.45			
5:50	82.44			
6:00 p.m.	82.45			Static level. Last reading

H. S. Anderson

STATE OF IOWA
IOWA GEOLOGICAL SURVEY
GEOLOGY ANNEX
IOWA CITY

RESULTS OF PUMPING TEST

Independence State Hospital Well No. 2
Independence, Iowa

August 31 - September 1, 1943

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 88 N., R. 9 W., Sumner Twp.
Elevations: 981 feet
Depth: 351 feet (plugged for this test at 225 feet)
Static water level: 86 feet

Casing: 24" from 1'3" to 128'6", cemented in place
12" from 1' to 162'6"

Pump: American Well Works head, pulley driven, 5-inch column and 8-inch bowls.
Bottom of bowls set at 148 feet with no suction pipe.

Power: 40 H.P. U. S. electric motor

Contractor: Charles D. Nolan, Cedar Rapids

All depths are given in feet below top of 12-inch casing, measured by air gage. Length of air-line = 140 feet. Impossible to use electric line to measure water level due to oil on surface of the water.

Productions measured by manometer in 6-inch discharge pipe with 3-inch and 5-inch orifices.

<u>Time</u>	<u>Depth to water (in feet)</u>	<u>Production (in g.p.m.)</u>	<u>Remarks</u>
Aug. 31, 1943			
2:11 p.m.	85.93		Static water level. (Measured by steel tape.)
2:40	85.91		Static water level. (Measured by steel tape.)
2:50			Pump started.
2:54	128 1/4	290	
2:58	126 1/4	less than 50	
3:06	107 1/4		
3:07	101		
3:09	97 1/4		
3:12			Pump stopped to change to 3-inch orifice.
3:14:30			Pump started.
3:16		80-120	
3:24			Pump stopped for a few minutes.
3:30	113 1/4	210	
3:45			Pump stopped to change to 5-inch orifice.

<u>Time</u>	<u>Depth to water (in feet)</u>	<u>Production (in g.p.m.)</u>	<u>Remarks</u>
4:15	85 1/4		
4:17			Pump started.
4:22	140 +	235	
4:30	135 3/4	245 ±	Water temp. = 51 1/4° F.
4:36	136 1/2	245 ±	
4:40	136	245 ±	Well No. 1 shut down.
4:47	136 1/2	245 ±	
5:00	135 1/4	245 ±	
Sept. 1, 1943			
7:30 a.m.			Pump started.
7:40	133 1/4	220 ±	
7:55	135		
8:03			Pump stopped to change to 3-inch orifice.
8:05			Pump started.
8:13	130	238	
8:25	130	235	
8:30	134	245	
8:40	133 1/4	243	
8:50	133	240	
10:05	131 1/2	232	
10:15	133 3/4	240	
10:20	136 1/4	250	
10:25	137	250	
10:40	137	249	
10:50	137 1/4	245	
11:00	136 3/4	247	
11:15	138 or more	250	
11:30	135 1/4	242	
11:55	135 1/4	248	
12:30 p.m.	138 or more	248	
12:35	134 3/4	240	
1:05	135 3/4	249	
1:20	138 or more	248	
2:25	135 1/2	236	
3:00	137	240	
3:40	138 or more	242	
4:05	135	236	Pump speeded to deliver full 250 g.p.m.
4:15	138 or more	250	
4:20	138 or more	250	
4:40	138 or more	250	Water temp. = 51 1/4° F.
4:50	138 or more	250	Pump stopped.
4:51	98 3/4		
4:52	91 1/4		
4:53	90 1/2		
4:54	90 1/2		
4:55	90 1/2		
5:00	90 1/4		
5:10	90		
5:15	90		Last measurement.

**IOWA GEOLOGICAL SURVEY
IOWA CITY, IOWA**

**Results of Pumping Test
State Hospital, Independence, Iowa
September 14, 1942**

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 88 N., R. 9 W., Sumner Twp.
Elevation: 981' (Alt.)
Depth: 351 ft.
Static Level: 81 ft.

Casings: 24" from 1'3" to 128'6"
12" from 1' to 162'6"
(to be cemented between 24" and 12" casings)

Pump: Americal Well Works head, pulley drive 6" column and 10" bowls
(3 stage)
Bowls (bottom) set at 166 ft. with no suction pipe (meas. below base
of pump which is 2.3 ft. above ground)
Power: 19-ton Case threshing steam engine

Discharge: Measured by manometer in 6" pipe with 5" orifice

Contractor: Charles D. Nolan, Cedar Rapids
Driller: J. E. Griffith, Cedar Rapids

All depth to water measurements by I.G.S. electric line. Measuring point is
E. edge of 30" curbing (temporary) which is even with ground surface and
1.23 ft. above top of 12" casing. (Drillers airline set at 160 ft. below
pump base. Air gage 2.0 ft. above ground)

TIME	DEPTH TO WATER (Ft. below H.P.)	MANOMETER (Inches)	PRODUCTION (G.P.M.)	REMARKS
11:05a.m.	80.27	(Airline 82)		Static level
11:10	80.25	(Airline 82)		Static level
12:10p.m.	80.25			Static level
12:13				Pump on
12:15			310	
12:20	127.55	6 $\frac{1}{2}$	305	
12:23	132.66	7 $\frac{1}{2}$	329	
12:30	145.72	8	347	Water cloudy
12:34	147.28	8 $\frac{1}{2}$	353	
12:37	149.85	8 $\frac{3}{8}$	355	
12:45	152.15	8 $\frac{1}{8}$	350	Water clearing
12:57	154.63	8 $\frac{1}{8}$	350	
1:03	154.48	8 $\frac{1}{8}$	350	
1:05				Temp. water = 51° F. air = 76° F.
1:15	156.30	8 $\frac{1}{2}$	353	Water clear
1:25	155.40	7 $\frac{7}{8}$	345	
1:30	156.40	8	347	
1:55	152.33	7 $\frac{1}{2}$	335	
2:25	154.72	7 $\frac{3}{4}$	340	

cc to Mr. Ralph Arnold, State Architect, Des Moines, October 17, 1942.
Mr. Chas. D. Nolan, Cedar Rapids, October 17, 1942.

Results of Pumping Test, Independence State Hospital

TIME	DEPTH TO WATER (Ft. below M.P.)	MANOMETER (Inches)	PRODUCTION (G.P.M.)	REMARKS
2:30	151.52	7 1/8	330	Temp. water = 51 1/4° F. air = 80° F.
2:50	155.80	7 1/2	335	
2:55	155.60	7 3/4	340	
3:05	146.72	6 1/4	307	
3:10	146.21	6 1/8	304	
3:32	152.60	7 1/8	330	
4:20	144.43	5 7/8	296	
4:43	148.86	6 1/4	307	
4:48.25				Pump off
4:49	96.95			Recovery readings
4:49.30	88.00			
4:51	82.15			
4:52	82.03			
4:53	81.90			
4:54	81.87			
4:55	81.83			
5:00	81.62			
5:05	81.46			
5:10	81.39			
5:20	81.36			
5:30	81.35			Last reading

K. E. Anderson

COMPARISON OF WATER ANALYSES

Name of well	Independence city well	Quasqueton George Dege	Galwein city well
Total depth	204'	159'	1328'
Producing horizon	Devonian-Silurian	Devonian-Silurian	Galena, St. Peter, Prairie du Chien, and Jordan formations.
Total solids	296.	374.	288.
Insoluble matter	23.4	21.5	8.5
Alkalinity (MeO)	242.	280.0	160.
R ₂ O ₃	3.4	2.5	10.
Nitrate as NO ₃	0.12	3.1	0.0
Alkalies as sodium	10.1	25.3	18.1
Calcium	71.7	82.2	58.3
Magnesium	18.4	28.5	12.8
Iron	0.6	0.4	0.1
Manganese	0.1	0.0	0.0
Fluorine	0.0	1.8	1.0
Chloride	9.0	4.0	11.0
Sulphate	30.1	62.2	47.9
Bicarbonate	295.2	341.6	219.6
Calculated hardness	249.	324.	201.