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

#16207

Location:

Town: Milo (NE) (SW) County Warren

SW NW NW Sec. 19, T. 75, N., R. 22 (E) (W) Twp.

Well name and number

Owner Milo Town Well 1964 Address Milo, Iowa

Tenant Address

Contractor Thorpe Well Co. Address Des Moines, Iowa

Drillers

Drilling dates Feb 13 - July 17, 1964

Well data:

Altitudes: Drilling curb feet; Land surface feet 971

Determined by

Topographic position

Total depth: Reported 2550 feet; Measured feet

Drilling method Rotary, Cable (Rotary: 0-1025)
35' of 16" csg. 0-35'

Hole and casing data 1025 of 8" csg. 0-1025
163' of 7" OD liner 1392'-1555'
5" csg. 1035-2037 and sealed into the 5" string

Original depth to water ft. above / below Date

Source of data

Sources of water: Principal PRAIRIE du CHIEN - JORDAN

Others ST. LAWRENCE ?

PRODUCTION DATA

Date

Static water level 258'

Pumping water level 340' (?) EST. - COULDN'T MEASURE

Yield (g.p.m.) 300

Measuring point

Duration of pumping

Specific capacity

LABORATORY DATA

PLS-731, 732, 733, 734, PLS-735, PLS-736

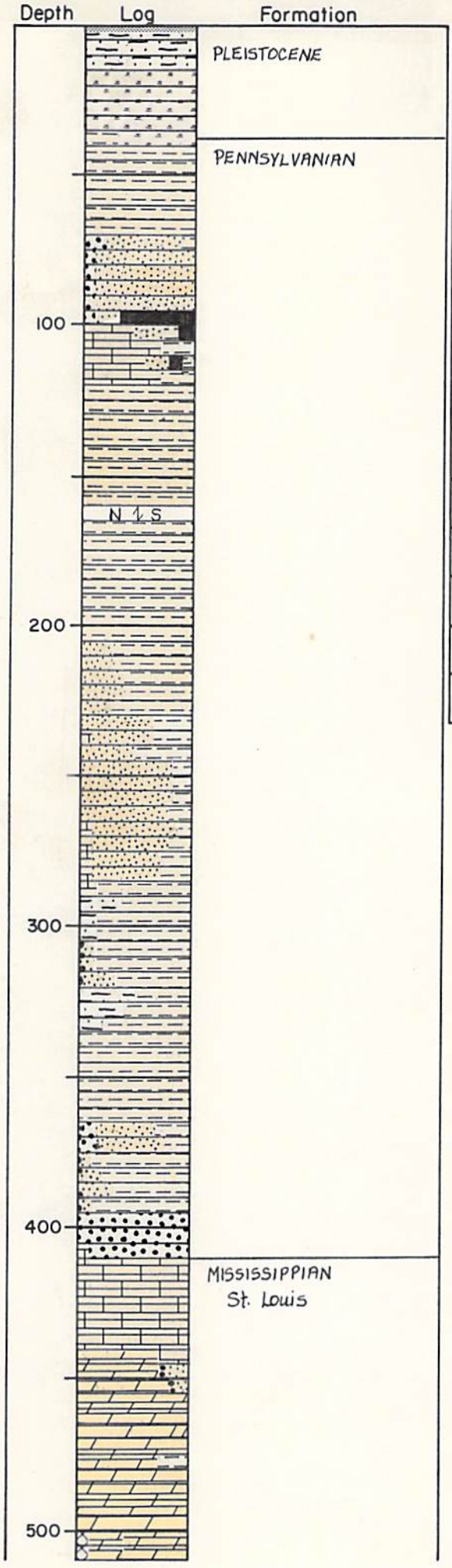
Well No. #16207 Sample range 0-2550' No of samples 483

No. of dupls. and cond. 483 - GOOD Washed range 45-2550

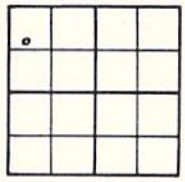
Samples prepared by SCHULZ, LOVETT ET AL. Date

Logged by NORTON Date 1964

Correlations by " Date "

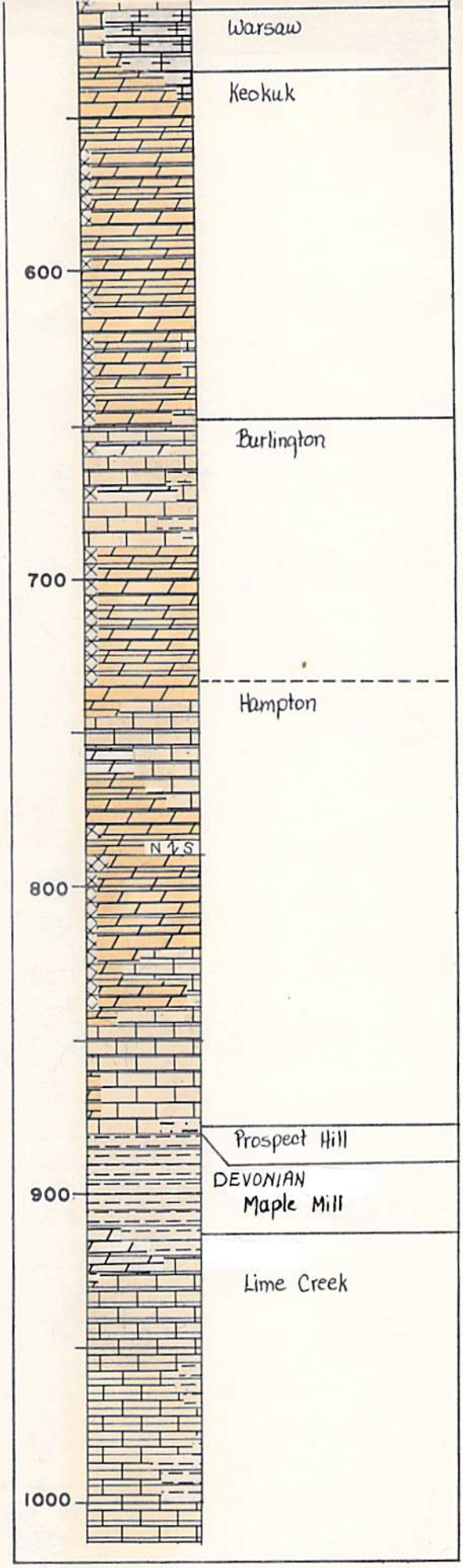


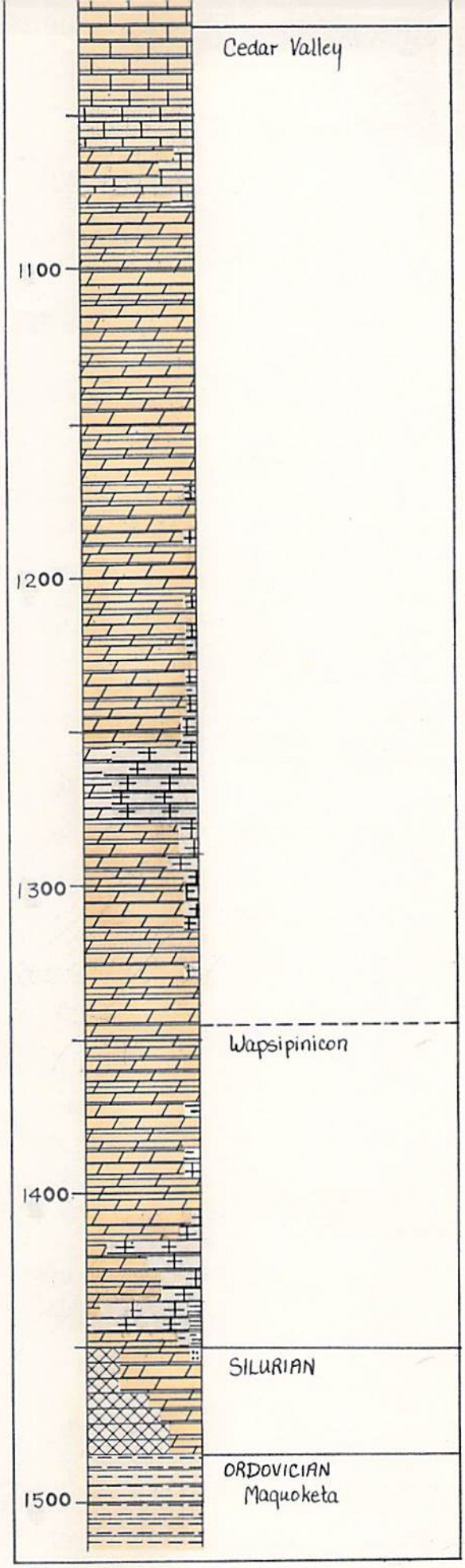
IOWA GEOLOGICAL SURVEY
In Cooperation with
U. S. GEOLOGICAL SURVEY
Iowa City, Iowa

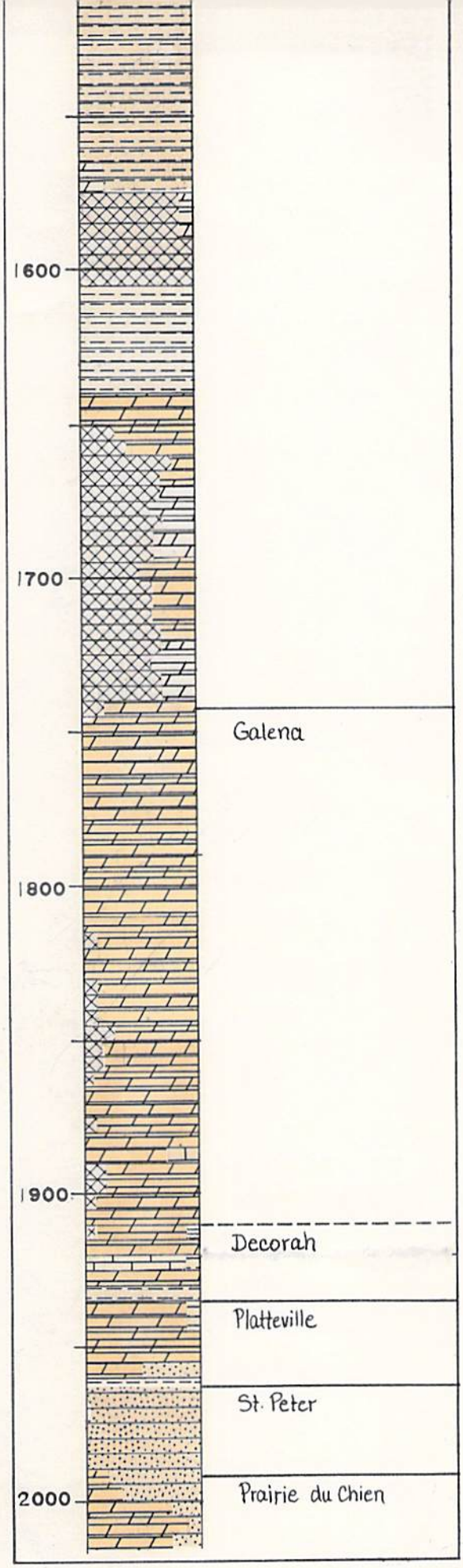
Name: Milo Town Well 1964	State: Iowa
Town: Milo — County: Warren	Loc.: SE SW NW NW
Contractor: Thorpe Well Co. — Driller:	Sec. 19
Drilling Dates: March 25 - July 17, 1964	T. 75 N., R. 22 W.
Casing Record: 35' of 16" csg. 0-35' 1025' of 8" csg. 0-1025' 163' of 7" OD liner 1392-1555' 1035' of 5" 1002-2037' Entering shoe on 5" out to 7" OD- Centralized-cemented by Haliburton with 250 sacks cement.	
S.W.L. 258 — G.P.M. 300 — D.D. 82	
Remarks: Rotary 0-1025'; Cable 1025'-TD.	Elev. 971'
	T.D. 2550'
Logged By: Koch 0-1037' 1964 Northup 1037-T.D.	I.G.S. No. W-16207

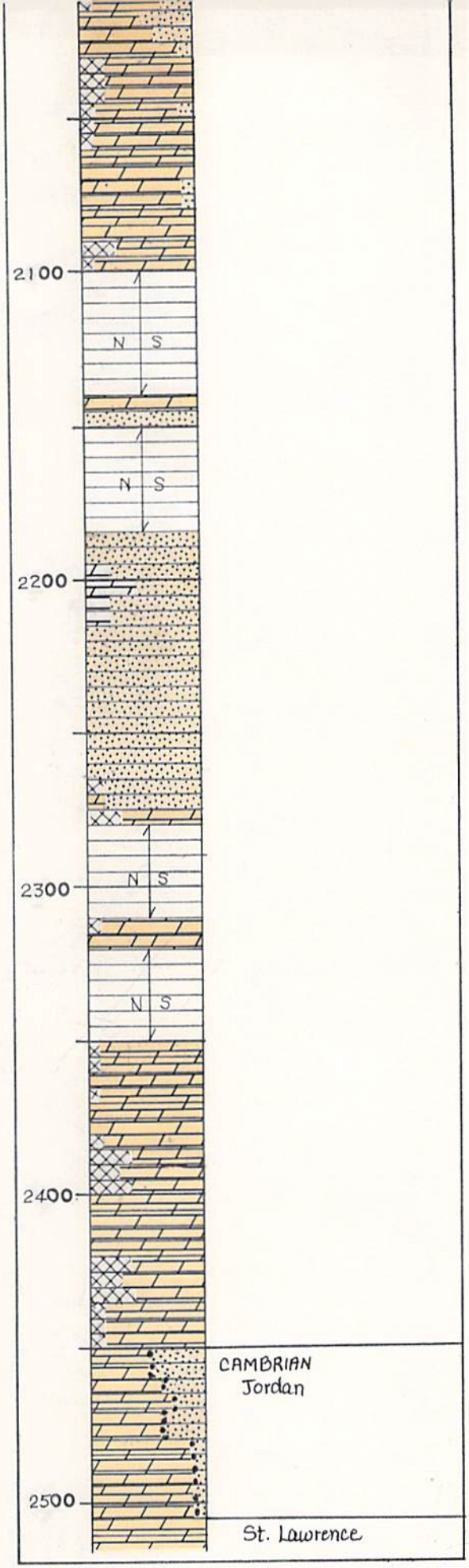
Explanation of Colors

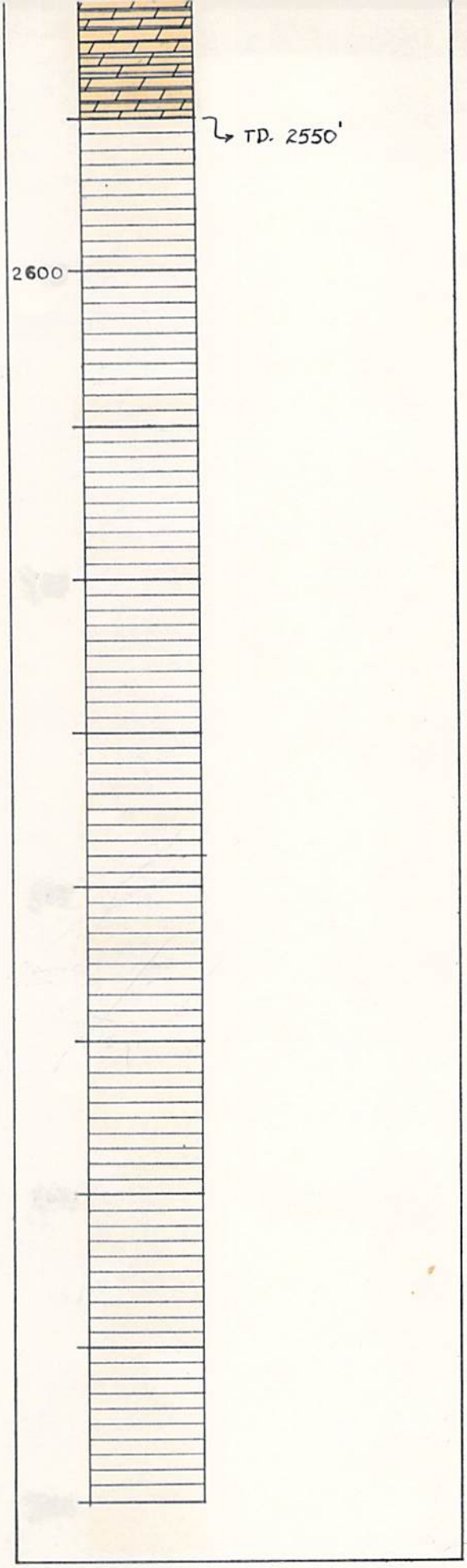
- Soil
- Loess, ~~Silt or~~ Siltstone
- Drift
- Sand & Gravel
- Shale
- Sandstone
- Limestone
- Dolomite
- Chert
- Gypsum or Anhydrite
- Coal
- N ↕ S — No Samples


Warsaw
Keokuk
600
Burlington
700
Hampton
N ½ S
800
Prospect Hill
DEVONIAN
Maple Mill
900
Lime Creek
1000


Cedar Valley
1100
1200
1300
Wapsipinicon
1400
SILURIAN
ORDOVICIAN
Maquoketa
1500


1600
1700
1800
1900
2000
Galena
Decorah
Platteville
St. Peter
Prairie du Chien


2100
N S
N S
2200
2300
N S
N S
2400
CAMBRIAN
Jordan
2500
St. Lawrence


TD. 2550'
2600

THORPE WELL COMPANY

BOX 1376 / DES MOINES 13, IOWA / 243-6105 / AREA CODE 515

We dig for our business

August 12, 1964

Iowa Geological Survey
Iowa City
Iowa

Attention: Mr. Dick Northup

Dear Dick:

As per my conversation with you this A.M., I am enclosing a copy of the driller's log and the pump test record for the well we just completed for the Town of Milo. I trust this is as you desired.

Sincerely,

THORPE WELL COMPANY

Mary Ann Pierce

Mary Ann Pierce
Office Manager

map

Encls.

PUMP TEST RECORD

THORPE WELL COMPANY, BOX 1376, DES MOINES, IOWA

For City Located at Milo, Iowa

Make, Kind and Size of Power 671 GMC

Bowl No. _____ Size 8-HC Stages 15

Column Setting 400 ft. Size 6" oil Shaft size 1½ Layne and _____

Static Level Before Pumping 290' After Pumping 258 Temperature 79o

Date	Time	Engine R.P.M.	Pump R.P.M.	Pumping Level	Gallons Per. Min.	Temp. Discharge Description	Sand P.P.M. Volume
7-10-64	9:30 A.M.	1200	1600	?	250		
	10:00 A.M.	1100	1470	"	234	79o	Cloudy
	10:30 A.M.	1100	1470	"	241	79o	Clear
	11:00 A.M.	1100	1470	"	241	79o	Clear
	11:30 A.M.	1100	1470	"	246	79o	Clear
Noon	12:00	1100	1470	"	250	79o	Clear
P.M.	12:30	1100	1470	"	250	79o	ClClear
	1:00	1100	1470	"	250	79o	Clear
	1:30	1100	1470	"	250	79o	Clear
	2:00	1100	1470	"	250	79o	Clear
	2:30	1100	1470	"	250	79o	Clear
	2:45	1000	1333	"	100	79o	Clear
	3:00	1000	1333	"	100	79o	Clear
	3:30	1000	1333	"	100	79o	Clear
	4:00	1000	1333	"	100	79o	Clear
	4:30	1300	1763	"	300	79o	Clear
	5:00	1300	1763	"	300	79o	Clear
	5:30	1300	1763	"	300	79o	Clear
	6:00	1300	1763	"	300	79o	Clear
	6:30	1300	1763	"	300	79o	Clear
	7:00	1300	1763	"	300	79o	Clear
	7:30	1300	1763	"	300	70o	Clear

PUMP TEST RECORD (continued) Page 2

For City Located at Milo, Iowa

Date	Time	Engine R.P.M.	Pump R.P.M.	Pumping Level	Gallons Per.Min.	Temp. Discharge Description	Sand P.P.M. Volume
7-10-64	8:00	1300	1733	?	300	79o	Clear
	8:30	"	1763	"	"	"	"
	9:00	"	"	"	"	"	"
	9:30	"	"	"	"	"	"
	10:00	"	1733	"	"	"	"
	10:30	"	"	"	"	"	Check
	11:00	"	"	"	"	"	Check
	11:30	"	"	"	"	"	"
	12:00	"	"	"	"	"	"
7-11-64	12:30	"	"	"	"	"	"
7-11-64	1:00	"	"	"	"	"	"
	1:30	"	"	"	"	"	"
	2:00	"	"	"	"	"	"
	2:30	"	"	"	"	"	"
	3:00	"	"	"	"	"	" "
	3:30	"	"	"	"	"	"
	4:00	"	"	"	"	"	"
	4:30	"	"	"	"	"	"
	5:00	"	"	"	"	"	"
	5:30	"	"	"	"	"	"
	6:00	"	"	"	"	"	"
	6:30	"	"	"	"	"	"
	7:00	"	"	"	"	"	"
	7:30	"	"	"	"	"	"
	8:00	"	"	"	"	"	"
	8:30	"	"	"	"	"	"
	9:00	"	"	"	"	"	"
	9:30	"	"	"	"	"	"

PUMP TEST RECORD (continued) Page 3

For City Located at Hilo, Iowa

Date	Time	Engine R.P.M.	Pump R.P.M.	Pumping Level	Gallons Per.Min.	Temp. Discharge Description	Sand P.P.M. Volume
7-11-64	10:00	1300	1733	?	300	79o	Clear
	10:30	"	"	"	"	"	"
	11:00	"	"	"	"	"	"
	11:30	"	"	"	"	"	"
Noon	12:00	"	"	"	"	"	"
P.M.	12:30	"	"	"	"	"	"
	1:00	"	"	"	"	"	"
	1:30	"	"	"	"	"	"
	2:00	"	"	"	"	"	"
	2:30	"	"	"	"	"	"
	3:00	"	"	"	"	"	"
	3:30	"	"	"	"	"	"
	4:00	"	"	"	"	"	"
	4:30	"	"	"	"	"	"
	5:00	"	"	"	"	"	"
	5:30	"	"	"	"	"	"
	6:00	"	"	"	"	"	"
	6:30	"	"	"	"	"	"
	7:00	"	"	"	"	"	"
	7:30	"	"	"	"	"	"
	8:00	"	"	"	"	"	"
	8:30	"	"	"	"	"	"
	9:00	"	"	"	"	"	"
	9:30	"	"	"	"	"	"
	10:00	"	"	"	"	"	"
	10:30	"	"	"	"	"	"
	11:00	"	"	"	"	"	"
	11:30	"	"	"	"	"	"

PUMP TEST RECORD (continued) Page 4

For City Located at Milo, Iowa

Date	Time	Engine R.P.M.	Pump R.P.M.	Pumping Level	Gallons Per.Min.	Temp. Discharge Description	Sand P.P.M. Volume
	12:00	1300	1733	?	300	79o	Clear
7-12-64	12:30	"	"	"	"	"	"
	1:00	"	"	"	"	"	"
	1:30	"	"	"	"	"	"
	2:00	"	"	"	"	"	"
	2:30	"	"	"	"	"	"
	3:00	"	"	"	"	"	"
	3:30	"	"	"	"	"	"
	4:00	"	"	"	"	"	"
	4:30	"	"	"	"	"	"
	5:00	"	"	"	"	"	"
	5:30	"	"	"	"	"	"
	6:00	"	"	"	"	"	"
	6:30	"	"	"	"	"	"
	7:00	"	"	"	"	"	"
	7:30	"	"	"	"	"	"
	8:00	"	"	"	"	"	"
	8:30	"	"	"	"	"	"
	9:00	"	"	"	"	"	"
	9:30	"	"	"	"	"	"

PUMP TEST RECORD (continued) Page 5

For City Located at Milo, Iowa

Date	Time	Engine R.P.M.	Pump R.P.M.	Pumping Level	Gallons Per.Min.	Temp. Discharge Description	Sand P.P.M. Volume
7-13-64	5:50	1300	1733	?	300	79o	Clear
P.M.	6:20	1300	1733	"	266	79o	Clear
7-14-64	8:25	1300	1733	"	266	79o	Clear
A. M.	8:40	1300	1733	"	266	79o	Clear
	8:42	1300	1733	"	266	79o	Clear

THORPE WELL COMPANY

2340 SIXTH AVENUE

DES MOINES, IOWA

R-1-B

Drilled for City of Milo Besido water tower at Milo, Iowa

Well is located / miles N-E-S-W and ____ miles N-E-S-W from ____

in the ____ ¼ ____ ¼ Section ____ Township ____ Range ____

Rotary- Feb. 15-1964 Rotary March 14, 1964

Drilling started Cable - March 25 1964 19__ Completed Cable July 17, 1964 19__

Well No. 1 Kind of Well Water Depth 2550 Size hole started 12 1/4 in

Finish 5" G. P. M. 300 Static Head 258 Pumping level from surface 340' ? - No way to check

Water was first encountered at ____ in ____ Approx. Amt. ____ Temp. ____

Remarks 8" pipe pressure grouted 1025 to surface -400 sacks - Had trouble getting cement to set behind 5"

(GIVE DETAILS OF PERFORATED PIPE AND SEALS)

RECORD OF PERMANENT PIPE					TEMPORARY PIPE	
SIZE PIPE	AMOUNT OF PIPE	DEPTH TO BOTTOM OF PIPE	DEPTH TO TOP OF PIPE	MAKE OF PIPE	SIZE PIPE	AMOUNT
16"	35'	35				
8"	1025	1025	0	.322 wall Std.		
7" O.D.	163	1555	1392			
5"	1035	2037	1002	Std.		
Cutting shoe on 5" set to 7 O.D. centralized. 250 sacks- Place with Halliburton behind 5".						

Darwin Evans - Max Smith- E. Greene — From Surface to 1025 feet

Driller

Doug Bruinkool — From 1025 feet to 1587 feet

Driller

Wes Mc Callie — From 1030 feet to 2550 feet

Art Lambert — From 1687 feet to 2550 feet

Driller

AMOUNT IN FEET	KIND OF SOIL OR FORMATION (BE SPECIFIC)	TOTAL DEPTH FEET
Top 1025 ' of drilling in placing 8" pipe and cementing done by 302 - Rotary. Balance of drilling done by 36 L. Cable Tool.		
2	Top Soil	0-2
31	Yellow Clay Sandy at Bottom	33
64	Gray Shale	97
7	Coal	104
302	Shale streaks of linestone near bottom In Gray Blue	406
130	dolomite and linestone some shale and gypsum	536
162	Dolomite and linestone some chert (10%)	698
82	Limestone and minor chert (25%)	780
26	Dolomite and chert (10-40%)	806
72	Limestone, Dolomite and some shale	878
2	Silt stone	880
31	Shale (gray)	911
103	Limestone & shale (about 50-50%)	1014
11	dolomite	1025

Cable tool- from 1025 to 2550

50	Light gray lime hard	1075
95	Dark Gray Lime	1170
34	Light gray lime	1204
9	Light gray dolomite hard	1213
165	Dark Gray Lime	1378
15	Dark grey lime and shale streak	1393
32	Dark Gray lime	1435
10	Light Gray Lime	1445
39	Light brown lime	1484
26	Brown & green shale	1510
50	Green Shale	1560
2	Dolomite	1587
44	dolomite and shale	1631
11	Shale	1642
23	Brown lime	1665
42	Gray lime	1707
43	Brown Lime	1850
32	Dolomite	1882
44	Brown lime	1926
13	Green Shale	1949
14	Brown Lime Hard	1963
6	Green Shale	1969
31	Sand St Peter	2000
20	Brown Lime	2020
140	Gray Lime	2160
50	Dolomite	2210
85	Sand	2295
55	No Cutting	2350
100	Dolomite	2450
35	Jordon Sand	2485
65	Gray lime	2550

GW Milo well folder
Warren County

MEMORANDUM April 9, 1964

To: Dr. H. G. Hershey
From: D. L. Koch
Re: Milo town well; phone call from Mr. Atchison of Thorpe Well Co.

Top Maquoketa 1483' (Neda zone)
Current 'depth - 1545' (middle Brainerd)

Maquoketa (Brainerd) shale caving badly; I advised drilling through the Brainerd (estimated bottom 1608') and set 7" OD liner; the lower Brainerd is dolomite and shale and will not cave as much as the upper part.

The next casing point will be below the St. Peter.

DLK/m

GW file Milo well folder
Warren Co.

MEMORANDUM May 4, 1964

To: Dr. H. G. Hershey
From: Richard C. Northup
Re: Milo town well

Art Lambert, driller for Thorpe Well Co. brought in samples from the new Milo town well early Monday morning. A spot check was made of the bottom samples to determine top and bottom of the St. Peter and depth of penetration into the Prairie du Chien. The samples show top Glenwood 1960', top St. Peter 1963', and top Prairie du Chien 1998'. Drilling has reached 2037 feet, and they will now set the cement and 6" casing, before going on to the Jordan.

RCN/m

GW Milo well folder
Warren Co

MEMORANDUM June 10, 1964

To: Dr. H. G. Hershey
From: Richard C . Northup
Re: Milo town well

Samples were received this morning from the new well at Milo (Warren County) from 2035' to 2485'. Top of the Jordan has been tentatively picked at 2455 feet, and drilling had reached 2515 feet this morning when Mr. Atchison at Thorpe Well Company called. This should place them very close to the top of the St. Lawrence, and if all goes well drilling should be completed this week. Mr. Atchison will see that the interval below 2485' is shipped to us today and they will continue to send us all additional samples promptly, as they are anxious to be sure of the St. Lawrence top, and intend to drill about fifty feet into the dolomite before shutting down. They have been drilling around the clock. There are several intervals in the Prairie du Chien where no cuttings could be bailed and this could well indicate crevices, although Mr. Atchison indicated that there has been no change in the static level.

RCN/m

MEMORANDUM June 15, 1964

TO DR. H. G. HENSHEY

FROM RICHARD C. NORTHUP

RE MILO TOWN WELL

DRILLING HAS BEEN COMPLETED AT MILO, WITH TOTAL DEPTH AT 2530'. ABOUT TWENTY FEET INTO THE ST. LAWRENCE. TOM AND WES THORPE BOTH REPORT THAT THE WATER QUALITY IS NOT AS GOOD AS SHOULD BE EXPECTED. CHLORIDES ARE HIGH AS WELL AS TOTAL HARDNESS. A STRING OF 5" CASING WAS SET AT 2037' ABOUT FORTY FEET INTO THE PRAIRIE DU CHIEN, WITH OPEN HOLE THE REST OF THE WAY. CEMENTING WAS DONE BY HALIBURTON, AND THE CEMENT DID NOT CIRCULATE TO THE TOP ACCORDING TO WES. ALSO THE CONTRACT APPARENTLY ONLY CALLS FOR SO MUCH CEMENT, AND THEY DON'T WANT TO PUT OUT ANY MORE MONEY FOR MORE AS THEY CAN HELP IT. THORPE AND HALIBURTON ARE TO COMEBACK AGAIN AND TRY TO DECIDE WHAT TO DO. IT IS HARD TO SEE HOW THE PRAIRIE DU CHIEN-JORDAN WATER CAN BE BAD AT MILO AS IT IS RIGHT ON A LINE BETWEEN INDIANOLA AND RUSSELL WHICH BOTH TURNED OUT VERY WELL, AND I AM INCLINED TO THINK IT IS COMING FROM SOMEWHERE HIGHER UP THE HOLE. THERE SHOULD BE A LOT OF WATER AT MILO AS THERE WERE MANY LARGE GAPS IN THE PRAIRIE DU CHIEN WHERE THE DRILLER REPORTED THE CUTTINGS WASHED OUT. THE JORDAN ITSELF IS NOT WELL DEVELOPED, BEING A TIGHTLY CEMENTED SANDSTONE AND SANDY DOLOMITE. ON THE OTHER HAND THE ROOF VALLEY WAS UNUSUALLY THICK AND, ALTHOUGH VERY FINE, SEEMED TO BE MOSTLY FREE AND SOFT.

We may be called by the town on Halliburton for our advise, but feel as in similar problems in the past, that it is pretty much up to Thorpe to work things out as to final cementing, testing etc. They seem to like to put someone "on the spot" when things go wrong, and think we should use caution in every possible way, although of course being as helpful as we can.

GW Milo well folder
Warren Co.

MEMORANDUM

June 15, 1964

To: Dr. H. G. Hershey
From: Richard C. Northup
Re: Milo town well

Drilling has been completed at Milo, with total depth at 2530', About twenty feet into the St. Lawrence. Tom and Wes Thorpe both report that the water quality is not as good as should be expected. Chlorides are high as well as total hardness. A string of 5" casing was set at 2037' about forty feet into the Prairie du Chien, with open hole the rest of the way. Cementing was done by Haliburton, the cement did not circulate to the top according to Wes. Also the contract apparently only calls for so much cement, and they don't want to put out any more money for more if they can help it. Thorpe and Haliburton are to confer again and try to decide what to do. It is hard to see how the Prairie du Chien - Jordan water can be bad at Milo as it is right on a line between Indianola and Russell which both turned out very well, and I am inclined to think it is coming from somewhere higher up the hole. There should be a lot of water at Milo as there were many large gaps in the Prairie du Chien when the driller reported the cuttings washed out. The Jordan itself is not well developed, being a tightly cemented sandstone and sandy dolomite. On the other hand the Root Valley was unusually thick and although very fine, seemed to be mostly free and soft.

We may be called by the town or Haliburton for our advise, but feel as in similar problems in the past, that it is pretty much up to Thorpe to work things out as to final cementing, testing, etc. They seem to like to put someone "on the spot" when things go wrong, and think we should use caution in every possible way, although of course being as helpful as we can.

RCN/m

coded

STATE HYGIENIC LABORATORY, DES MOINES BRANCH
WATER LABORATORY DIVISION
MINERAL ANALYSIS

LAB. NO. 481
MINERAL NO. 5023
31 August 19 65

TOWN Milo COUNTY Warren
OWNER OF SUPPLY Town
COLLECTOR'S NAME Jack W Clemens
DATE COLLECTED 10 August 1965 DATE RECEIVED 10 August 1965
REPORT TO: NAME Division of Public Health Engineering
ADDRESS State Department of Health

FIELD DATA

SOURCE: WELL NAME, NUMBER, POINT OF COLLECTION, DEPTH, CONSTRUCTION DATE, ETC.,
2550' Well Treated Water from Filter

WELL PUMPED 100 HRS. AT 300 GPM. DATE OF PREVIOUS SAMPLE 12 May 1965
WAS SAMPLE FREE OF TURBIDITY WHEN COLLECTED Yes
TEMPERATURE °C ALKALINITY (ppm $CaCO_3$) P T pH
IS A POLYPHOSPHATE BEING USED?

LABORATORY ANALYSIS
(PARTS PER MILLION)

SPECIFIC CONDUCTANCE K AT 25°C 107 x 10^{-5} TURBIDITY
DISSOLVED SOLIDS 673 SOLUBLE IRON (Fe) 0.58
TOTAL SOLIDS 673 SILICA (SiO_2) 13.2 TOTAL IRON (Fe) 0.58
ALKALINITY (ppm $CaCO_3$) P None T 256 pH 7.8 DATE 8/10/65

POSITIVE IONS		NEGATIVE IONS	
K^+	14.7	NO_3 XXX	3.4
Na^+	142	F^-	2.5
Ca^{++}	63.2	Cl^-	47
Mg^{++}	19.9	SO_4^{--}	208
Mn^{++}	< 0.05	HCO_3^-	312
Al^{+++}		CO_3^{--}	None

HARDNESS AS $CaCO_3$ 240 ppm 14.0 gpg

ANALYST Ryan, Ebert

R. L. MORRIS
(DWE) PRINCIPAL CHEMIST

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.
	0	2		Top Soil
	2	18		yellow clay
	18	33		Hard yellow clay (Sandy)
	33	40		Shale
	40	91		Grey Shale
	91	97		Grey Shale + Layers of Coal
	97	104		Coal
	104	123		Dark Grey Shale + Limestone Streaks
	123	230		Grey Shale (Light To Dark)
	230			Shale (Blue + Grey) Siltstone +
		380		Layers of Limestone
	380	406		Hard Shale + Limestone Streaks
	406	451		Dolomite + Limestone (Minor Shale)
	451	495		Dolomite + Limestone
	495	536		Dolo. Gyp., Quiz, + Limestone
	536			Dolo, + Limestone, some chert
		598		Dolo. Limestone + some shale + chert

Sample No.	DEPTH From	DEPTH To	THICKNESS	DESCRIPTION OF BEDS KIND OF ROCK, COLOR, HARD OR SOFT, WATER, ETC.
	698	764		(A little Dolomitic) Limestone & Minor chert, False Chert
	764			Dolo Minor Chert & Plain Chert
		780		Dolo, Minor Chert to ~ 75 To
	780	806		Dolo, Some Limestone & Minor Chert
	806	834		Limestone Some Dolo,
	834	878		Limestone, Some Shale & Dolo.
	878	880		Silty Tone
	880	911		Shale (Grey)
	911	937		Limestone & Shale