IOWA GEOLOGICAL SURVEY
Iowa City, Iowa
WELL OR WATER SAMPLE DATA

Bottle No. _____

I.G.S. Well No. _____

TOWN PLEASANTVILLE COUNTY MARION

LOCATION SW NW sec. 15 T. 76 N., R. 21 W. Twp.

OWNER OF WELL Town WELL NO. _____

USE OF WATER: Municipal supply(X); Private-domestic( ); Public drinking( ); Livestock( ); Industrial( ); School supply( ); Air conditioning( ); Cooling( );
_____( ).

CONSTRUCTION OF WELL: Drilled: Cable tool( ), Rotary( ); Gravel-pack type( ); Driven( ); Dug( ); Bored( ); Jetted( ); _____( ).

CONTRACTOR VARNER WELL Co DATE STARTED _____
DATE FINISHED _____

CASING OR CURBING DATA: (Show by diagram on opposite side of sheet the kind, length and depth of top and bottom of each size of pipe, the amount of overlaps, position of seals or packers, pipe perforation and screens, etc.)
12" CASING 0 TO 500' SWEDGE REDUCER
8" " 500 TO 1905'
1905 TO 2405 OPEN HOLE

WELL DATA
Curb Elevation _____ Ft. Present Depth _____ Ft. Final Depth 2405 Ft.

Ground Elevation 922.7 Ft. Topographic Position _____

Static Level (Depth to water (above) (below) curb) 222.97 Ft. Pumping Level 277.28 Ft.

Amount of Drawdown 54.31 Ft. pumping at 948 g.p.m. in 5 hrs. 0 minutes.

Specific Capacity 17.5 g.p.m. per ft. drawdown in 5 hours.

Type of Pump Turbine Power DIESEL

Depth of Bottom of Pump 355+ 8 STAGE BOWL ft. with 5 ft. of suction pipe.

TEMPERATURE: Air ____ °F.; Water 73 °F., measured after well had pumped 6 hours and 0 mins. at 948 g.p.m.; 350 ft. from pump after water had passed through the following pipe ALUMINUM Time 2.00 (A.M.) (P.M.)

SOURCE OF WATER:
Principal producing formation _____ ____ft. to _____ft.

Other producing formations _____ ____ft. to _____ft.

REMARKS: (Taste, odor, and appearance) _____

Sample taken for: Mineral analysis (X); Sanitary analysis ( ).
Data collected by L STEELE + J. ROBERTS Date 1-31-67

Copies to: JOHN HEFLING - GARDEN ENG Co - OSKALOOSA
DON WATT VARNER WELL CO, DUBUQUE

DEEP GROUND-WATER CONDITIONS AT PLEASANTVILLE, IOWA

The following commentary represents an interpretation of the available hydrologic data in the files of the Iowa and U. S. Geological Surveys.

The town of Pleasantville (1960 population 1,025) is located on Highway 60 mostly in the SW¼NW¼ sec. 15, T. 76N., R. 21W., Marion County. This places it on high ground at a surface elevation of about 925 feet above sea level. Based on this elevation as a starting point a generalized log of the anticipated underlying rocks down through the St. Lawrence Dolomite is summarized in tabular form as follows:

Formation	Thickness(ft.)	Depth Range(ft.)
Quaternary System		
Pleistocene Series (thin loess at top, underlain by glacial drift, may contain some interbedded sand and gravel layers)	135±	0-135±
Pennsylvanian System		
Des Moines Series (mostly shale, commonly some thin sandstones)	190±	135±-325±
Mississippian System		
St. Louis Formation (limestone, dolomite, and sandstone in variable percentages)	25	325±-350
Warsaw-Keokuk-Burlington Formations (dolomite and limestone, some chert, may contain thin shale in upper part, may contain gypsum in thin beds or disseminated)	200	350-550
Gilmore City Formation (oolitic limestone)	10	550-560
Hampton Formation (limestone and dolomite, some chert)	90	560-650
North Hill Limestone	20	650-670
Prospect Hill Siltstone	5	670-675
Maple Mill Shale	50	675-725
Devonian System		
Lime Creek Formation (limestone, probably some shale)	110	725-835
Cedar Valley Formation (limestone at top, underlain by dolomite, considerable gypsum in lower half)	300	835-1135
Wapsipinicon Formation (dolomite with gypsum in lower half, may contain chert zone at base)	100	1135-1235
Silurian System		
Niagaran Series (dolomite)	25	1235-1260

Formation	Thickness(ft.)	Depth Range(ft.)
Ordovician System		
Maquoketa Formation (mostly shale in upper half with some dolomite and/or chert in lower part; dolomite and chert in lower half)	260	1260-1520
Galena Formation (dolomite with minor chert in lower half)	185	1520-1705
Decorah-Platteville Formations (dolomite, some shale)	55	1705-1760
St. Peter Sandstone	35	1760-1795
Prairie du Chien Formation (dolomite, sandy in upper half, minor chert, Root Valley Sandstone Member in middle)	465	1795-2260
Cambrian System		
Jordan Sandstone, dolomitic	50	2260-2310
St. Lawrence Dolomite, silty	100+	2310-2410+

All these depth figures ~~probably will~~ may have to be modified somewhat owing to local variations in the structure and thickness of the beds. The formation calls are referred to the driller's log of the deep well drilled for the town in 1920 to a depth of 1,826 feet and other deep wells in this part of Iowa.

The Pleasantville well originally tapped the interval from the lower Galena Dolomite through the upper Prairie du Chien Formation. The main source was the St. Peter Sandstone. A pumping test reportedly produced 70 gallons a minute at an unknown drawdown. The original static head was 180 feet below the curb. Mineral analysis indicated the water to be acceptable for drinking, but it was reported to have a strong odor of hydrogen sulfide. ~~Some years later~~ Subsequently the well ~~reportedly~~ caved and filled in up to 400 to 600 feet above the bottom. It was suspected that the water from the St. Peter and Galena Formations corroded the casing. A mineral analysis obtained in 1946 showed the concentration of sulfate in the water had more than doubled (1,335 parts per million) ~~apparently~~ indicating that probably water was entering the well from the gypsum-bearing interval in the Devonian rocks. ~~On this basis~~ Thus several water zones are expected to occur in the bedrock formations underlying Pleasantville down through the St. Peter Sandstone, but most data indicate that ~~the~~ only moderate yields ~~to wells will be fairly low and~~ obtained and that the water will be rather highly mineralized.

The most promising aquifer for a large capacity well in this area seems to be the Jordan Sandstone and associated dolomite formations at a depth of between 2,200 and 2,400 feet. Highly successful wells have been completed in this interval ~~aquifer~~ at Sully, Milo, Indianola, Avon (General Mills, Inc.), the Ivy-Runnells School east of Des Moines, Altoona, and a ~~several~~ few other communities in this part of Iowa. Upwards of several hundred gallons a minute usually can be obtained and by properly developing the well the production may be increased to as much as 1,000 gpm

or more. For example, the Ivy-Runnells School well produced 896 gpm at 22 feet of drawdown, the General Mills, Inc. well produced 2,273 gpm at 84 feet of drawdown, and the Indianola well 1,000 gpm with 245 feet of drawdown. The Indianola well was acidized. ~~Of course,~~ Such favorable results may not be found everywhere. However, the chances appear reasonably promising that a supply of 1,000 gpm can be obtained at Pleasantville. In all these wells the casing extends from the surface for ~~a short~~ some distance into the upper part of the Prairie du Chien Dolomite to obtain a complete shut out of the highly mineralized water in the overlying formations. A layer of cement grout usually is injected into the annular space outside the casing and for its full length to protect it from corrosion and prolong the life of the well. The non-pumping water level of the Jordan-St. Lawrence aquifer is expected to be between 700 and 725 feet above sea level or about 200 to 225 feet below land surface at Pleasantville. Mineral analyses indicate the water from the Jordan-St. Lawrence aquifer probably will be of good quality and perhaps as good or better than the water from the existing shallow wells on the Des Moines River bottoms north of town. Several mineral analyses showing the quality of the water from the old deep well and existing shallow wells at Pleasantville, and from the Jordan-St. Lawrence aquifer ~~from wells~~ in the surrounding area are summarized on a separate sheet appended to this report.

Additional water zones probably will occur in the underlying rocks, ~~principally~~ the lower Cambrian sandstones, for many hundreds of feet below. However, not much information is available on ~~wells reaching below the St. Lawrence Formation~~ deeper aquifers in the Pleasantville area in southern Iowa. Nevada, in Story County, has a well 3,342 feet deep penetrating the Dresbach Sandstone that is moderately successful. Production was 650± gpm at a pumping water level of about 400+ feet. At this rate the specific capacity is 3 gpm/ft. of drawdown. Except for a fairly high iron content the water seems to be satisfactory for drinking and other general uses. State Center, in Marshall County, also put down a well to the lower Cambrian sandstones, but the results were not as successful. The well was plugged back to the base of the St. Lawrence where it obtained 650-700 gpm with a drawdown of about 60 feet representing a specific capacity of about 10 gpm/ft. of drawdown. At Ottumwa the John Morrell Packing Company well No. 8 penetrated the Dresbach Sandstone at 2,655 feet and obtained highly mineralized and salty water. ~~Subsequently,~~ Later the well was plugged back to the St. Lawrence Formation at 1925 feet and produced a natural flow of potable water. Another well put down for the Morrell Packing Company in the near vicinity of well No. 8 and to approximately the same depth developed 3,000 gpm with only 54 feet of drawdown.

From the foregoing it appears that reasonably good chances exist for developing a large capacity well in the Jordan-St. Lawrence aquifer at Pleasantville. This will require drilling to a depth of about 2,400 feet. For best results casing should be set and cemented from the surface to about 160 feet below the base of the St. Peter Sandstone and the well thoroughly developed either by ~~surging~~ acidizing or overpumping. ~~Acidizing might also help.~~

PJH 1-65

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

Town - Well No. 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	Cond.
Pleasantville town No. 1 (1949)	3/7/62	27	Sand & gravel	60	408	.24	1.4	83	31	1.2	6.1	0	325	74	5	0.3	0.9	336	266	70	7.5	620
Pleasantville town No. 2 (1956)	3/7/62	33	"	60	414	.30	.96	91	31	1.6	5.4	0	339	73	6.5	.25	0.4	356	278	78	7.6	650
Pleasantville town deep well (1920)	9/25/34	1826	Galena Platteville St Peter		1340	2.0	0	104	39	317		-	327	637	141	3.	0	420	268	152	7.3	-
" "	9/5/46	"	*		2583	0.1	0	147	54	600		-	295	1335	207	1.3	4.9	589	242	347	7.7	3330
Avon (1960) General Mills, Inc	8/5/63	2428	Ft du C Dpdan St Lou	74	434	2.2	< .05	58	28	11	56	0	305	117	15	2.0	< 0.1	259	250	9	7.6	740
Milo town (1924)	11/12/64	2550	"	79	711	.17	< .05	61	24	16	144	0	305	242	52	2.5	< 0.1	250	250	0	7.8	1130
Indianola city (1956)	9/3/60	2525	"	80	738	.30	< .05	69	20	16	146	0	325	270	36	2.6	< 0.1	256	252	0	7.7	1140

* - Partially corroded casing opposite gypsum beds in Devonian
< - Less than

GW Pleasantville Co. Data
Marion Co.

January 27, 1965

Mr. John W. Hesling
Garden Engineering Service
P. O. Box 451
Oskaloosa, Iowa

Dear Mr. Hesling:

In reply to your letter of January 22 concerning the prospects of developing a municipal well in the Jordan Sandstone at Pleasantville, Iowa, we have reviewed the available information in our files. The pertinent data are summarized in the accompanying report.

I hope this report fully answers your questions. However, if any questions remain or if I can be of additional assistance in this matter, please feel free to call or write me.

Very truly yours,

H. G. Hershey

HGH/pjh/m
Enclosure

GARDEN ENGINEERING SERVICE
P.O. BOX 451 PHONE 673-7637
OSKALOOSA, IOWA
CONSULTING ENGINEERS

IOWA GEOLOGICAL SURVEY
JAN 25 1965

JANUARY 22, 1965

MR. H. GARLAND HERSHEY
DIRECTOR
IOWA GEOLOGICAL SURVEY
GEOLOGICAL SURVEY BUILDING
IOWA CITY, IOWA 52240

DEAR SIR:

WE HAVE BEEN RETAINED BY THE TOWN OF PLEASANTVILLE, IOWA TO THOROUGHLY INVESTIGATE THE COST OF CONSTRUCTING A JORDAN WELL AND TREATMENT PLANT COMPLETE.

THE TOWN, AS YOU KNOW, PRESENTLY DRAWS THEIR WATER FROM SAND WELLS ON THE DES MOINES RIVER BOTTOM. THE DES MOINES RIVER VALLEY WILL BE FLOODED OCCASIONALLY IN THIS AREA AFTER CONSTRUCTION OF THE RED ROCK DAM IS COMPLETE AND THE CORPS OF ENGINEERS HAS DEVISED A SYSTEM FOR CONTINUED USE OF THESE WELLS BY THE CONSTRUCTION OF SILOS TO RAISE THE WELLS ABOVE HIGH WATER. ALSO, THEY PROPOSE TO MOVE THE TREATMENT PLANT OUT OF THE FLOOD PLAIN. AS AN ALTERNATE TO THIS, THE TOWN DESIRES TO DETERMINE IF A JORDAN WELL CONSTRUCTED IN THE TOWN, POSSIBLY BEHIND THE TOWN Hall ~~WELL~~, WOULD NOT BE A BETTER SOLUTION TO THE WATER SUPPLY PROBLEM.

WOULD YOU PLEASE SEND ME THREE COPIES, THEREFOR, OF A FORECAST FOR A JORDAN WELL LOCATED IN PLEASANTVILLE. SO FAR AS OUR PRELIMINARY PLANS ARE CONCERNED WE ARE CONSIDERING a 1000 GPM WELL FIGURING THE LIFE OF THE WELL TO BE APPROXIMATELY 50 YEARS.

WE WILL APPRECIATE ANY AND ALL INFORMATION THAT YOU MAY SEND.

YOURS TRULY,

GARDEN ENGINEERING SERVICE

BY John W. Hesling
JOHN W. HESLING, P. E.

JWH:MB
CC: EMIL HANSEN, MAYOR

GW Pleasantville town well folder Marion Co.

January 9, 1967

Mr. John W. Hesling
Garden Engineering Service
Post Office Box 451
Oskaloosa, Iowa

Dear Mr. Hesling:

The duplication of samples from the depth interval of 2,250 to 2300 feet in the Pleasantville well has been discovered and those samples are being returned under separate cover.

Upon completion of the geological log of this well copies of the log will be prepared for you and your client.

Very truly yours,

H. G. Hershey

HGH-OVE/1

GARDEN ENGINEERING SERVICE
PHONE 673-7637 P.O. BOX 451
OSKALOOSA, IOWA
CONSULTING ENGINEERS

MERRILL L. GARDEN, P.E.
JOHN W. HESLING, P.E.
JOHN W. N. STEDDOM, P.E.

JANUARY 6, 1967

MR. BUD SHEETZ
IOWA GEOLOGICAL SURVEY
GEOLOGICAL SURVEY BUILDING
IOWA CITY, IOWA 52240

DEAR MR. SHEETZ:

WHEN YOU PICKED UP THE SAMPLES AT THE PLEASANTVILLE WELL SITE THE OTHER DAY YOU WERE INADVERTENTLY GIVEN A DOUBLE SET OF SAMPLES FROM ~~2065'~~ 2250' THROUGH 2300' WHICH INCLUDES THE JORDAN STRATA. COULD YOU PLEASE SEND THE SAMPLES TO OUR OFFICE IN OSKALOOSA.

WE WOULD ALSO LIKE TO HAVE A GEOLOGICAL LOG OF THIS WELL FROM YOUR OFFICE FOR OUR FILES AND FOR OUR CLIENT WHENEVER THIS IS AVAILABLE.

YOURS TRULY,

GARDEN ENGINEERING SERVICE

JOHN W. HESLING, P. E.

MB

PUMPING TEST AT THE PLEASANTVILLE TOWN WELL
MARION COUNTY, IOWA

A pumping test was performed on the Pleasantville town well on January 31, 1967. The Geological Survey cooperated in obtaining rate of discharge data and made water-level measurements from the pumping well.

The test was started at 8:02 a. m. and the Survey took measurements for approximately 5½ hours. The static water level was 220.37 feet BLSD and the pumping level was approximately 274.68 BLSD after 5½ hours of pumping. The drawdown was 54.31 feet, which is a specific capacity of 17. ~~5 feet~~ gpm/ft under these conditions.

Pumping and water-level records should be kept when the well is put into production in order to aid any future planning.

L. L. Steele
John Roberts

GW Pleasantville well folder 1966 (Herring)

March 1, 1967

City Clerk
Pleasantville, Iowa

Dear Sir:

We have completed the examination of well cuttings from the Pleasantville City Well (1966-1967).

A copy of our geologic log is enclosed for your files.

Very truly yours,

H. G. Hershey

HGH/1
Enclosure
cc Garden Engr. Service

Information from Varner 3/14/74

Pleasantville town well (1967)
Original SWL. 222'
" PWL 346' @ 300 gpm
" Sp. cap. 2.42 gpm/ft. dd

Acidized with 4000 gallons HCl, 15%, injected through pump column. Well was sealed at pump base.

GW Pleasantville deepwell (1967) folder Marion Co.

June 14, 1967

City Clerk
Pleasantville, Iowa

Dear Sir:

We are greatly interested in increasing our file of geophysical data on municipal deep water wells. Such data includes obtaining an electric log and a gamma-ray log by use of Survey-owned equipment. A terminal sonde or probe is let down the well bore and variations in electric currents flowing through a potentiometric circuit are recorded on graph paper in the case of the electric log. A different sonde is used to obtain a gamma-ray log. The log obtained is a measure of the natural radioactivity of the rock; no radio-active material is introduced into the well bore.

These graphic logs provide the following information:

1) accurate casing data
2) exact intervals of shale, sandstone, and carbonates; this information could be useful if the well should ever pump excessive sand or clay.
3) porosity zones
4) characteristic curves for correlating with other locations.

You may recall that a Survey representative visited your new well on March 3, 1967. The gamma-ray logging unit was not in working order at that time, and it was decided not to remove the spot-welded plate on top of the casing since only an electric log could be obtained in the uncased portion of the well bore.

Our logging unit has been repaired and we would like permission to log the well if the pump has not yet been installed. Would you be able to remove the welded plate to provide access to the well? We have no way within our organizational funds to pay a local welder for this service.

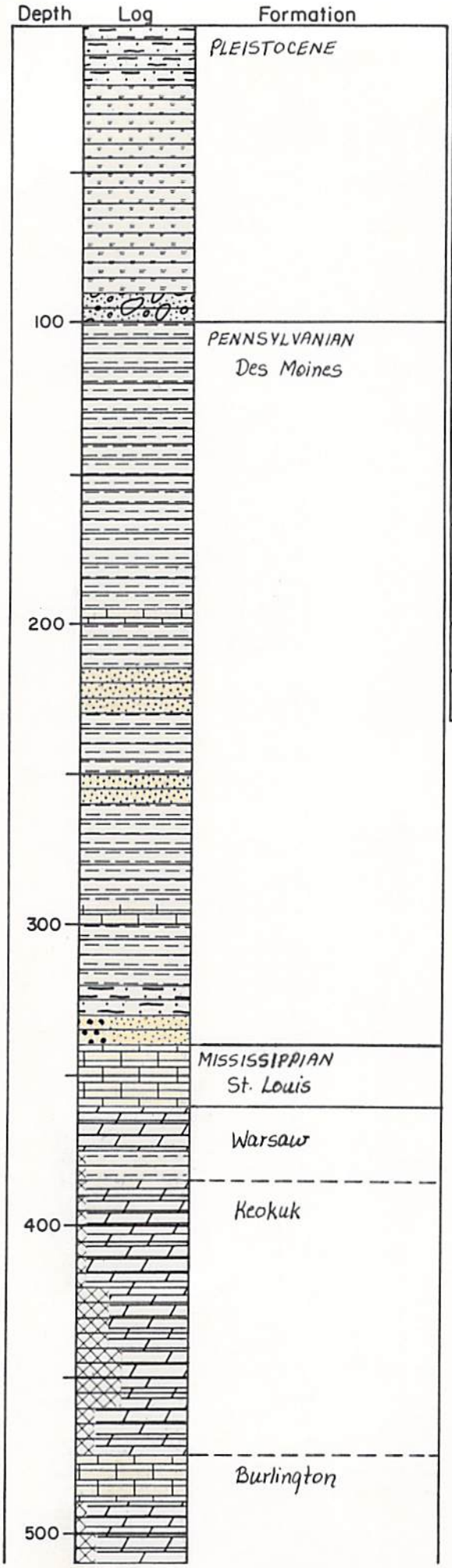
If we are able to log the well we will send you a copy of each of the logs to add to the lithologic log previously received from this office.

I would appreciate your consideration of this request. If we are able to log your new well we will have the equipment and personnel there before the end of June.

Very truly yours,

H. G. Hershey

HGH-DLK/1

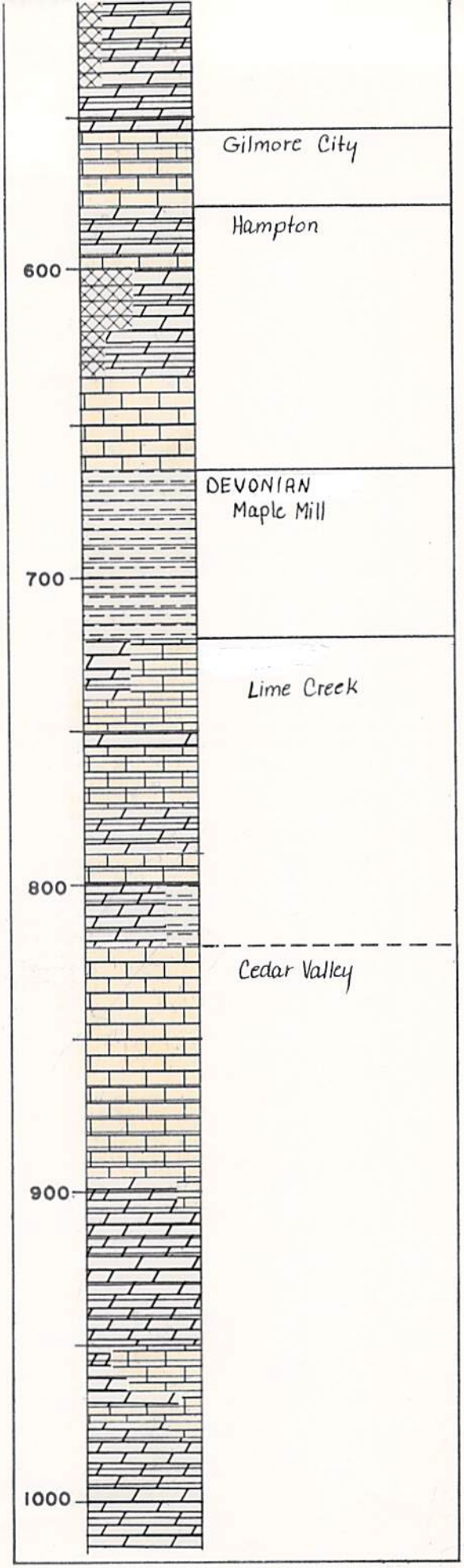


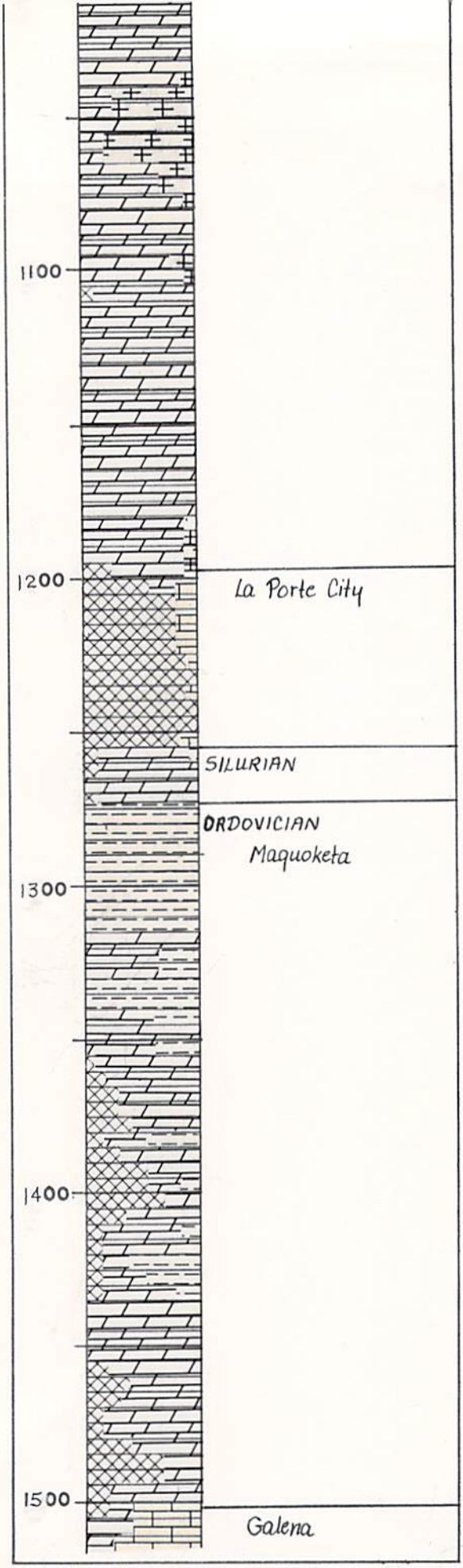
IOWA GEOLOGICAL SURVEY
In Cooperation with
U. S. GEOLOGICAL SURVEY
Iowa City, Iowa

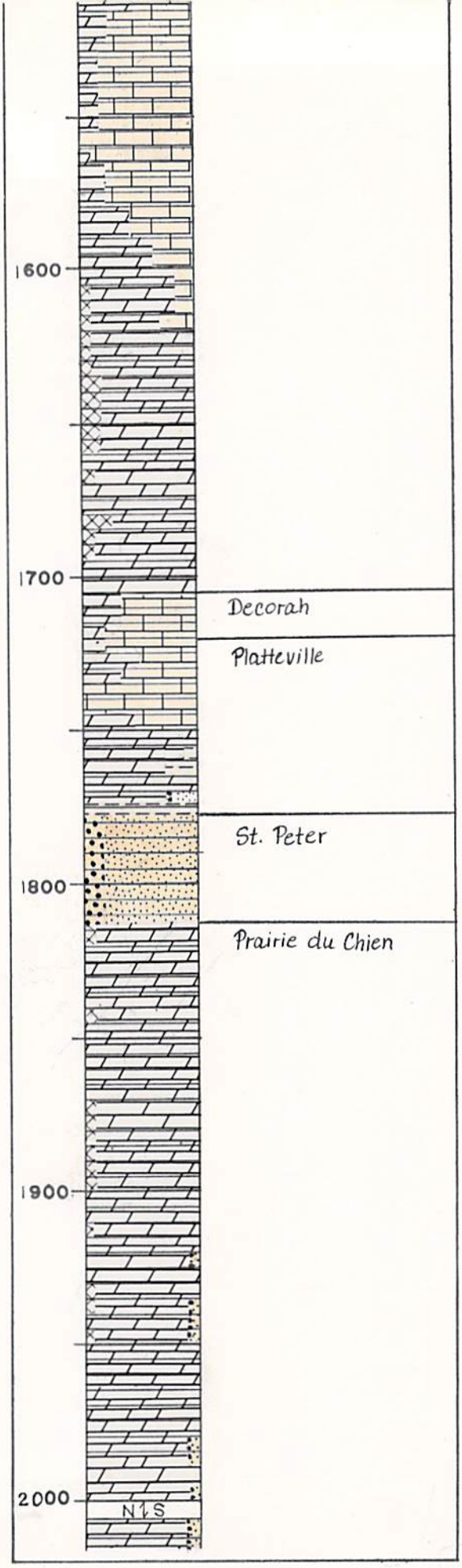
Name (1966-1967) Pleasantville City Well	State Iowa
Town Pleasantville County Marion	Loc. SW SW NW
Contractor Varner Well Co. Driller	Sec. 15
Drilling Dates Oct. 1966 - Jan. 31, 1967	T. 76 N., R. 21 W.
Casing Record 500' of 12" csg. (0'-500')	
1405' of 8" csg. (500'-1905')	
S.W.L. 221' G.P.M. 948 D.D. 55'	
Remarks Well acidized with 4000 gal. HCL	Elev. 922.7
	T.D. 2405'
Logged By Northup - Jan. 1967	I.G.S. No. W-19067

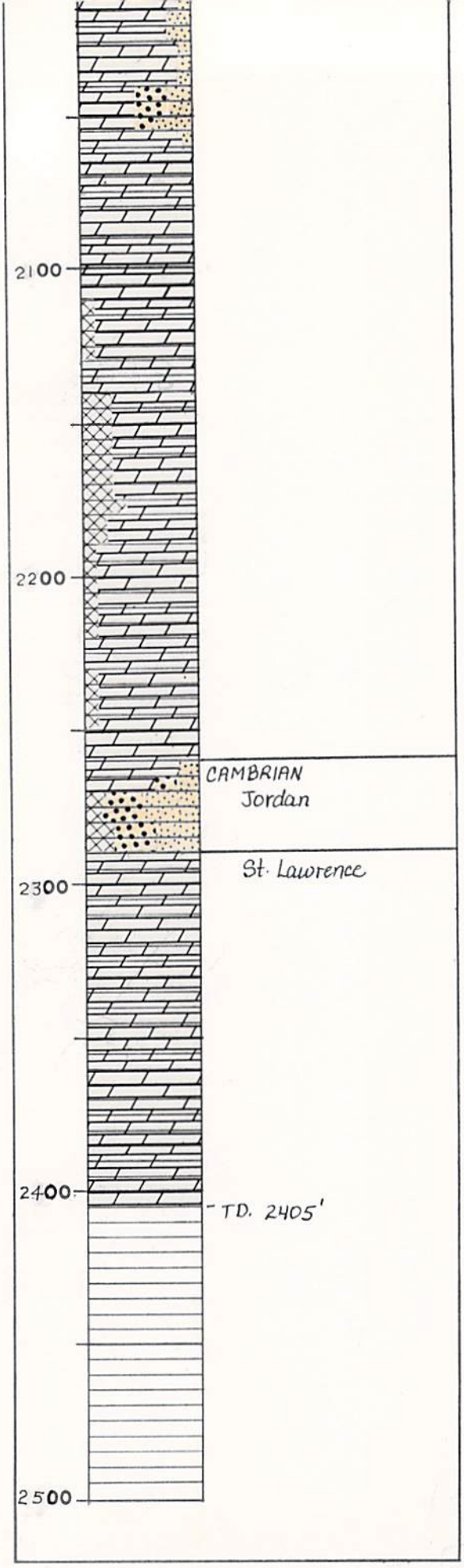
Explanation of Colors

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


Gilmore City
Hampton
600
DEVONIAN
Maple Mill
700
Lime Creek
800
Cedar Valley
900
1000


1100
1200
La Porte City
SILURIAN
ORDOVICIAN
Maquoketa
1300
1400
1500
Galena


1600
1700
1800
1900
2000
Decorah
Platteville
St. Peter
Prairie du Chien
N↓S


2100
2200
CAMBRIAN
Jordan
St. Lawrence
2300
2400
TD. 2405'
2500

PLEASANTVILLE 1-31-67

