Groundwater Quality Near Ancona, Illinois

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The groundwater quality in the region around Ancona, Illinois, is variable and often exceeds the secondary drinking water standards.

Figures 1-4 show the total dissolved solids (TDS) and sodium concentrations for all of the wells in the Illinois State Water Survey database with locational information; Figure 5 shows only wells that are coded as either being in a shallow aquifer or have a reported depth of less than 500 feet. Of the 1,280 samples in our database with TDS values, 80 samples (6%) were over the value of 2,020 mg/L found at your well of interest. Similarly, 27 of the 877 samples (3%) in our database with sodium (Na) values were over the value of 796 mg/L found at your well of interest. For the samples with reported well depths, we see a pattern of poor water quality at shallow depths less than 400 feet and at deeper depths greater than 1,700 feet. The lower TDS values at intermediate depths include sandstones that we believe are recharged in the Starved Rock area, where they are exposed to the surface.

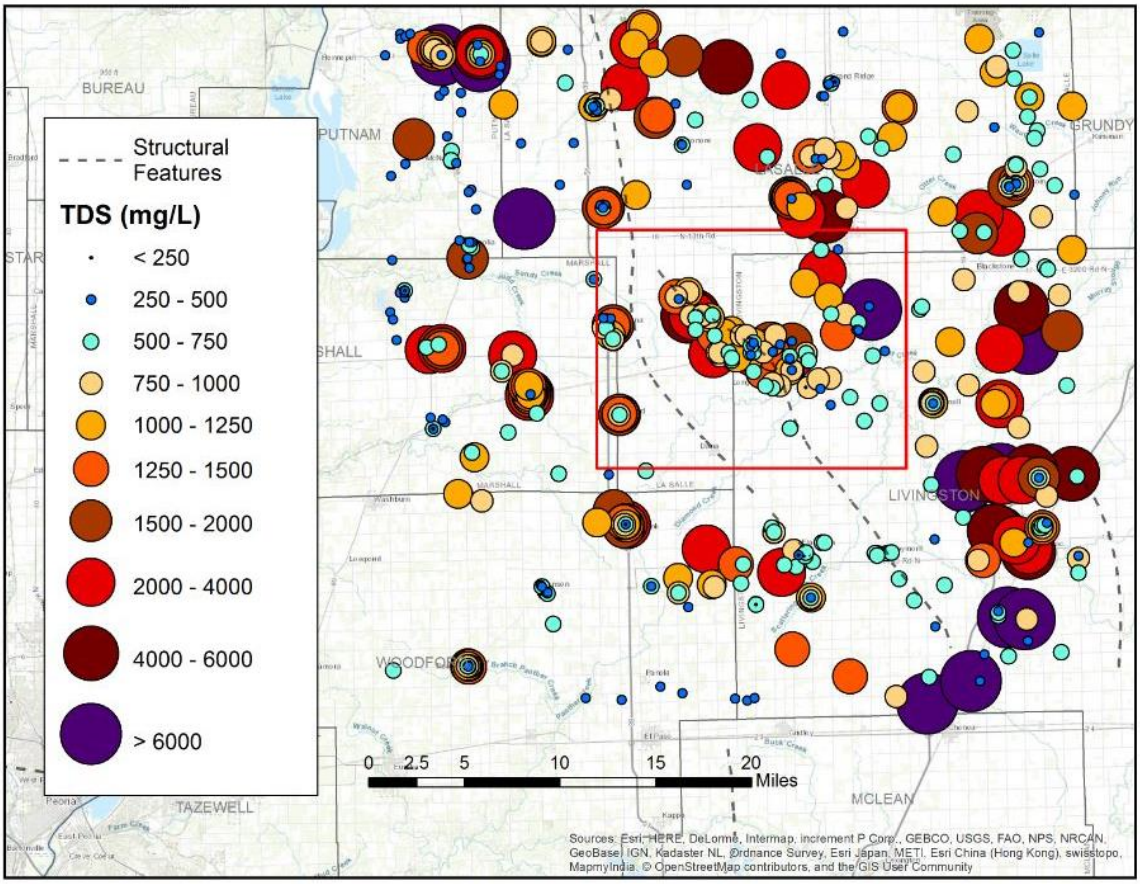


Figure 1a: Total dissolved solids (TDS) concentration from all wells in the Illinois State Water Survey database.

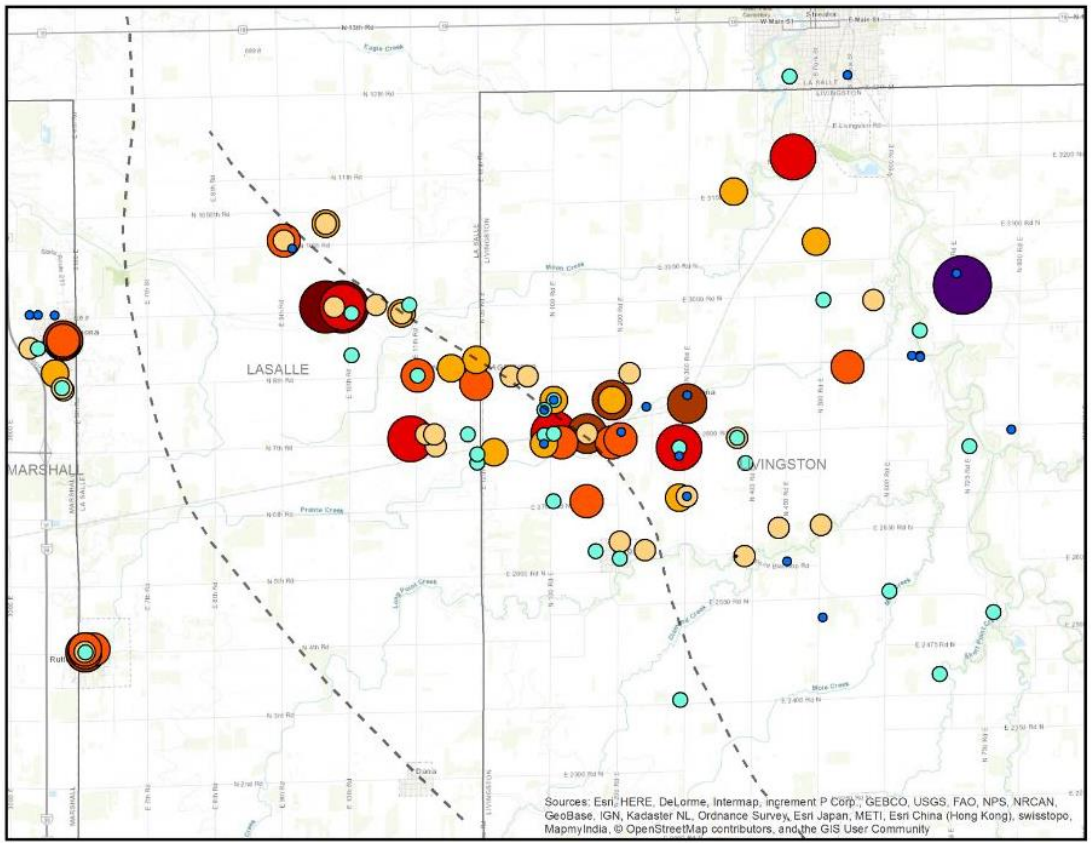


Figure 1b: Close up of the Ancona region.

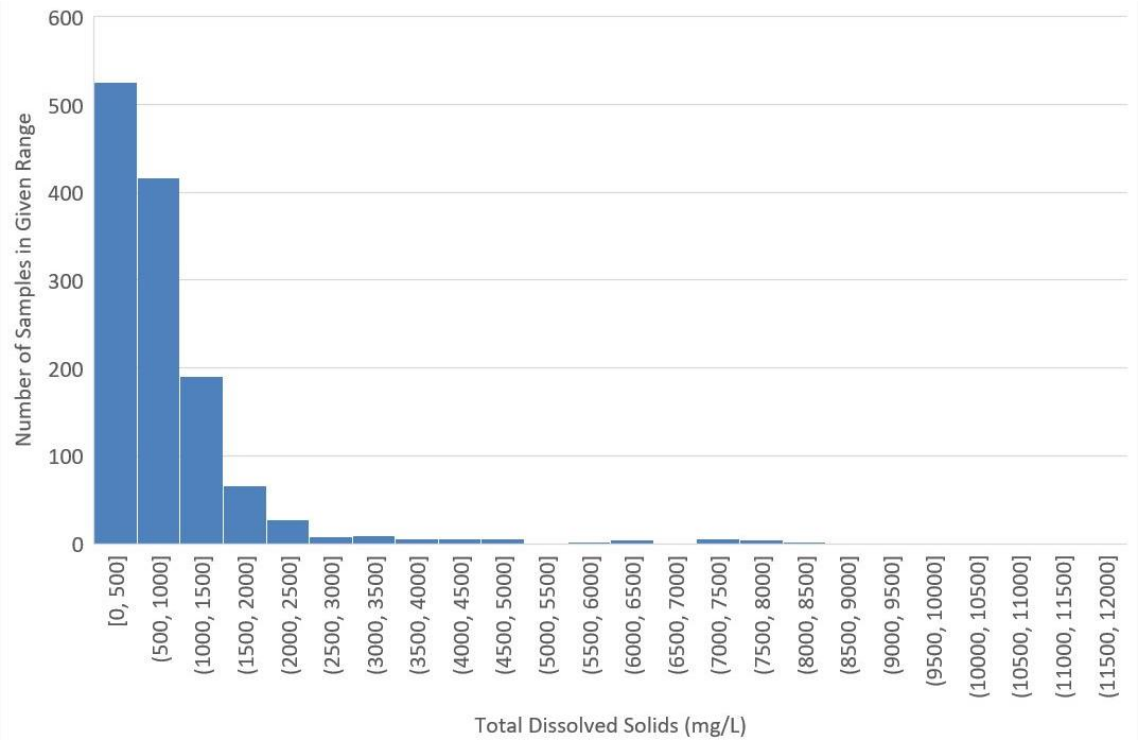


Figure 2: Total dissolved solids concentrations in ISWS Water Quality Database (80 of 1,280 samples over 2020 mg/L)

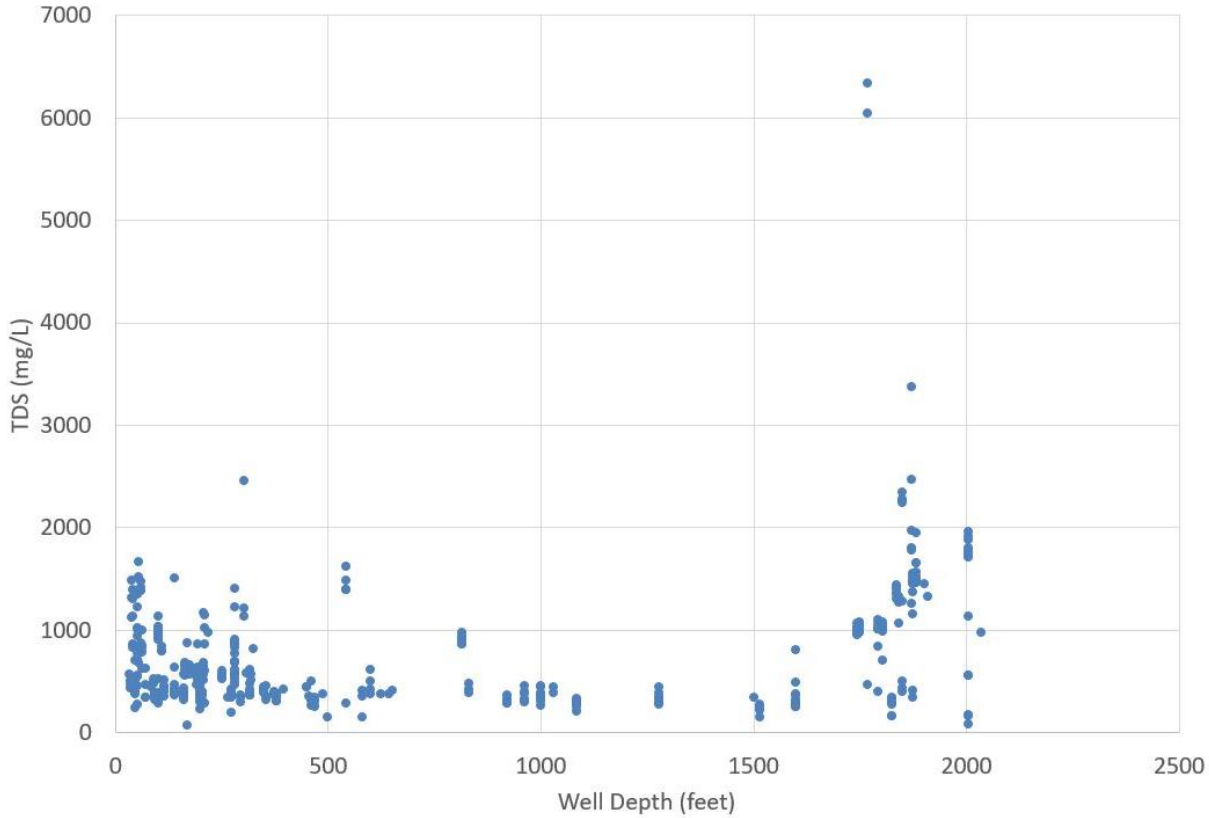


Figure 3: Total dissolved solids vs well depth.

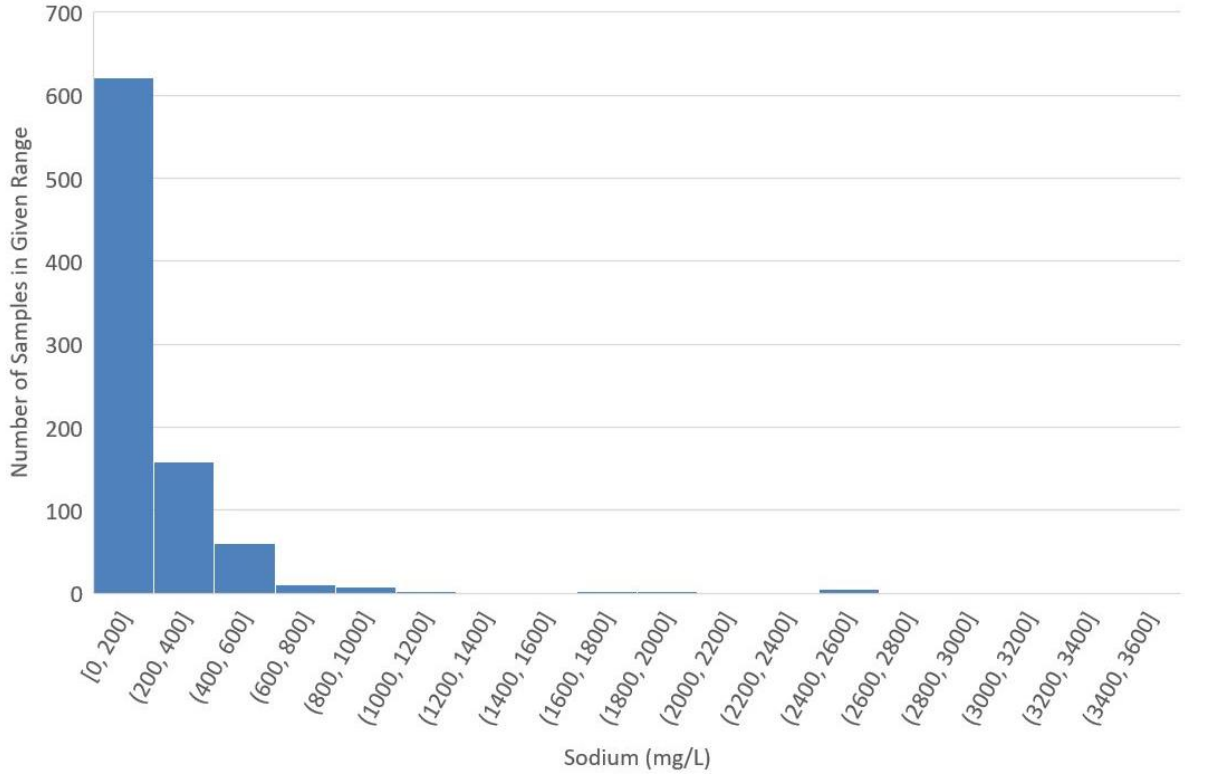


Figure 4: Sodium concentrations in the ISWS Water Quality Database (27 or 877 samples over 796 mg/L).

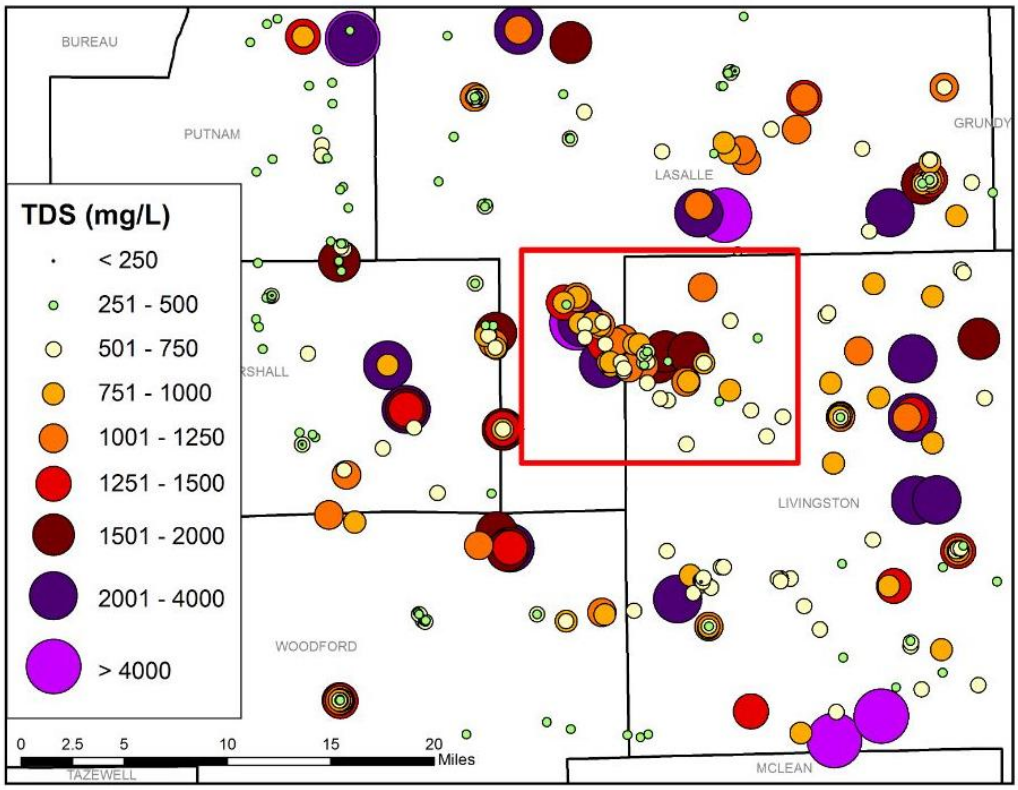


Figure 5a: TDS concentration for wells that are either in a shallow aquifer or have a reported depth of less than 500 feet.

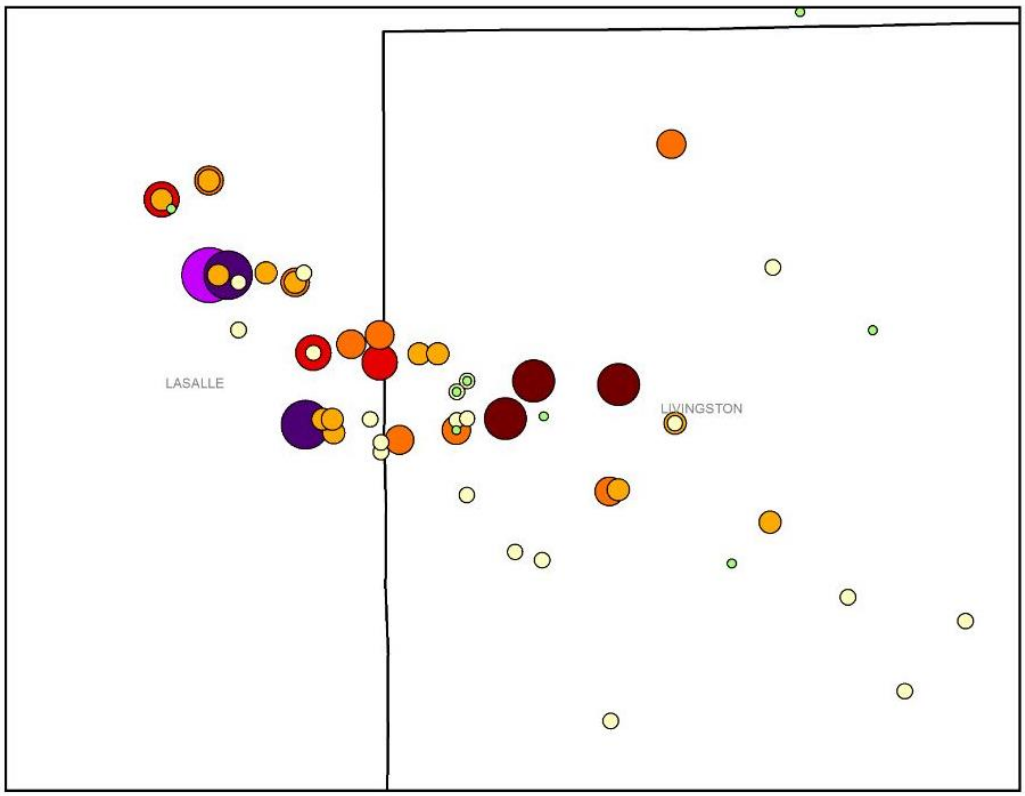


Figure 5b: Close up of the Ancona region.

As part of Northern Illinois Gas Company's petitions to construct the Ancona and Garfield gas storage fields, they collected samples from 63 farm wells in the area in 1962 and 1963 prior to the start of gas injection. The ISWS analyzed the water for each sample, and the Illinois State Geological Survey assisted with the collection of gas samples that were sent to a lab in Indiana for analysis. Each sample was given a number and plotted on maps as part of the petition dockets. I have also attached the gas results that are in the dockets. The water quality results were not included in the dockets so I have attached a scan of our paper records and a summary spreadsheet of the data. The scan includes some duplicate water analyses and some gas analyses. I could not find any reports relating to this data other than a short reference in the testimony of Wendell Cleaver included as part of the docket. The TDS concentrations for these samples have a similar distribution as all of the data although the mean is a little higher (1,034 mg/L vs 916 mg/L). This data may be helpful in tracking any changes in groundwater quality that may have occurred over these gas fields.

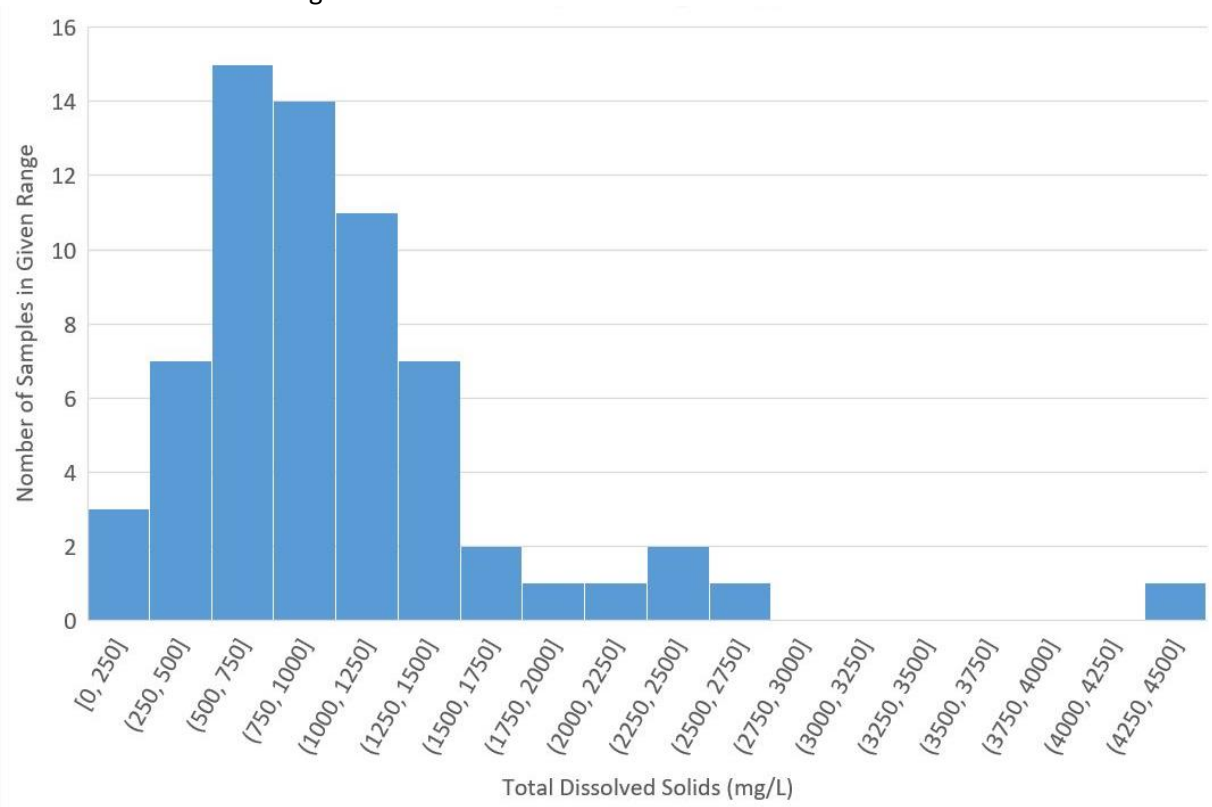


Figure 6: Total dissolve solids concentrations from 1962-1963 Ancona-Garfield Study, 5 of 63 samples over 2,020 mg/L

In summary, the concentrations of water quality parameters at your well of interest are at the high end of the normal range. Without a more detailed groundwater quality study of current conditions in the area, it is not possible to determine if the poor water quality in you well of interest is natural or from any nearby pumping/injection activities.

Ancona-Garfield Farm Well Data

Sample	Subsample	Well depth	AqCode	fips	twn	rng	sec	plot	Lambert_x	Lambert_y	lab #	Date	Alkalinity (mg/L as CaCO3)	Cl, d (mg/L)	Fe, t (µg/L)	Hardness, t (mg/L as CaCO3)	NO3, t (mg/L)	TDS (mg/L)
1		40		105	30N	03E	33	1G	3171800	2911923	0157978	6/13/1962	188	160	300	1550	660	2309
1	A	105		105	30N	03E	33	1G	3171800	2911923	0160114	5/1/1963	336	37	7600	466	1.4	578
2		65		105	30N	03E	33	8H	3167180	2912583	0157979	6/13/1962	300	112	300	849	395	1267
3		35	0101	105	30N	03E	33	1A	3171800	2907963	0157980	7/1/1962	324	110	200	867	415	1186
4		70		105	30N	03E	28	7H	3167894	2917782	0157981	6/5/1962	200	58	200	556	310	907
5		25	0101	105	30N	03E	28	8A	3167234	2913162	0157982	6/14/1962	236	7	100	382	38.8	491
6		40		105	30N	03E	32	1H	3166494	2912324	0157983	6/14/1962	252	40	600	781	450	1282
7		122		105	30N	03E	29	4A	3164541	2913008	0157984	6/14/1962	324	75	300	635	58.7	858
8		30	0101	105	30N	03E	29	4A	3164541	2913008	0157985	6/14/1962	368	145	1200	1140	275	1908
9		85		105	30N	03E	25	5H	3185098	2918280	0157986	6/12/1962	308	11	6300	770	20.4	1321
10		45	0101	099	30N	02E	25	1G	3155788	2916919	0157987	6/12/1962	312	11	6400	760	19.7	1321
11		112	2020	099	30N	02E	25	8H	3151168	2917579	0157988	6/15/1962	912	100	4800	170	2.8	1290
12		35	0101	099	30N	02E	25	8H	3151168	2917579	0157989	6/15/1962	200	20	1100	370	48.7	525
13		30	0101	099	30N	02E	14	5A	3147873	2923151	0157990	6/15/1962	284	31	1000	580	58.7	858
14		30	0101	099	30N	02E	14	1A	3150513	2923151	0157991	6/15/1962	256	28	600	398	71.3	572
15		126		105	30N	03E	32	4A	3164514	2907704	0157992	6/13/1962	388	125	200	896	193	1280
16		30	0101	105	30N	03E	32	8A	3161874	2907704	0157993	6/13/1962	256	30	3100	486	97.5	685
17		28	0101	105	30N	03E	32	8A	3161874	2907704	0157994	6/13/1962	260	35	2500	488	95.2	639
18		190		099	30N	02E	15	1A	3145232	2922985	0157995	6/16/1962	999	1725	800	82	1.3	4372
19		30	0101	099	30N	02E	15	2A	3144572	2922985	0157996	6/16/1962	384	120	200	566	80	908
20		25	0101	099	30N	02E	15	1A	3145232	2922985	0157997	6/16/1962	810	440	200	1440	235	2083
21		30	0101	099	30N	02E	23	2H	3149907	2922483	0157998	6/15/1962	236	100	500	724	122	1036
22		181	2020	099	30N	02E	23	2H	3149907	2922483	0157999	6/15/1962	196	90	4700	624	95.2	923
23		24	0101	105	30N	03E	34	2H	3176374	2912691	0158960	10/18/1962	496	44	1500	672	1.6	757
24		22	0101	105	30N	03E	34	2H	3176374	2912691	0158961	10/18/1962	436	51	2200	608	2.2	686
25		214		105	30N	03E	34	1E	3177034	2910711	0158962	10/18/1962	564	13	100	130	3.6	634
27	A	45		105	30N	03E	34	8A	3172414	2908071	0158964	10/18/1962	460	1	2600	420	3.6	468
27		35	0101	105	30N	03E	34	8A	3172414	2908071	0158963	10/18/1962	216	43	14000	542	2.9	839
28		45	0101	105	30N	03E	30	1D	3161168	2914885	0158965	10/18/1962	384	17	300	426	2.9	535
29		190		105	30N	03E	29	8A	3161901	2913008	0158966	10/18/1962	999	285	3800	68	1.4	2742
30		58	0101	105	30N	03E	29	8A	3161901	2913008	0158967	10/18/1962	388	12	800	362	1.3	547
31		28	0101	105	30N	03E	30	1A	3161168	2912905	0158968	10/18/1962	524	24	1100	402	4.5	746
32		85		105	30N	03E	28	5D	3169214	2915142	0158969	10/19/1962	468	1	2500	330	4.2	478
33		30	0101	105	30N	03E	30	5H	3158528	2917525	0158970	10/19/1962	220	10	2800	394	5.2	861
34		32	0101	105	30N	03E	31	1H	3161150	2912215	0158971	10/19/1962	212	73	1800	630	140	1125
35		127		105	29N	03E	03	1B	3176970	2903364	0158972	10/25/1962	756	36	900	96	3.6	894
36		15	0101	105	29N	03E	03	2B	3176310	2903364	0158973	10/25/1962	16	1	1300	38	7.4	66
38		18	0101	105	30N	03E	27	8D	3172448	2915381	0158974	11/1/1962	332	60	600	1160	438	1656
40		28	0101	099	30N	02E	24	4A	3153810	2918169	0159096	12/1/1962	228	55	100	684	112	1098
40	A	103	2020	099	30N	02E	24	4A	3153810	2918169	0159097	12/1/1962	828	100	200	192	1.6	1182

Ancona-Garfield Farm Well Data

41		110	2020	099	30N	02E	25	2A	3155128	2912959	0159098	12/1/1962	368	9	0	272	5.1	526
42	A	20	0101	105	30N	03E	31	7G	3157190	2911555	0159099	12/1/1962	370	49	100	750	54.3	1094
43		25	0101	105	30N	03E	30	3H	3159848	2917525	0159100	12/1/1962	312	9	100	454	1.9	800
44		100		105	30N	03E	32	7H	3162534	2912324	0159101	12/1/1962	999	87	0	140	13.8	1388
45		25		105	30N	03E	29	1E	3166521	2915648	0159103	12/1/1962	336	175	0	828	53.8	1208
45	A	200	0101	105	30N	03E	29	1E	3166521	2915648	0159102	12/1/1962	416	155	100	1085	138.9	1746
47		30	0101	105	30N	03E	31	1H	3161150	2912215	0159104	12/1/1962	248	3	200	290	10.6	340
49		75		105	30N	03E	27	8E	3172448	2916041	0160116	5/1/1963	326	3	1600	156	5.7	340
50		87		105	30N	03E	29	8E	3161901	2915648	0160117	5/1/1963	980	104	1500	140	0.7	1187
50	A	52		105	30N	03E	29	8E	3161901	2915648	0160118	5/1/1963	240	14	400	356	45.2	427
51		22	0101	099	30N	02E	24	1B	3155790	2918829	0161470	9/14/1963	424	37	1700	740	1.8	1167
51	A	92	2020	099	30N	02E	24	1B	3155790	2918829	0161471	10/1/1963	536	48	3600	867	13.8	1190
52	B	120	2020	099	30N	02E	25	6A	3152488	2912959	0161472	9/12/1963	332	14	800	252	6.6	886
53		120	2020	099	30N	02E	36	6H	3152589	2912034	0161473	9/23/1963	632	140	600	76	1.8	968
54		25	0101	099	30N	02E	23	8H	3145947	2922483	0161474	10/1/1963	324	32	700	424	13.6	625
55	B	30	0101	099	30N	02E	36	1F	3155889	2910714	0161477	9/23/1963	396	37	6100	500	11	625
55		30	0101	099	30N	02E	36	1G	3155889	2911374	0161475	9/23/1963	356	9	3300	388	10.7	520
56		30	0101	099	30N	02E	26	1A	3150616	2912611	0161478	10/1/1963	236	6	3300	1460	4.8	2284
57		25	0101	099	30N	02E	23	8C	3145947	2919183	0161479	10/1/1963	368	5	4000	352	1.3	540
58		30	0101	099	30N	02E	15	7H	3141272	2927605	0161480	9/23/1963	348	2	200	280	1	454
59		30	0101	099	30N	02E	10	3C	3143903	2929562	0161481	9/23/1963	344	79	24000	680	12	1062
59	A	30	0101	099	30N	02E	10	3C	3143903	2929562	0161482	9/23/1963	272	52	4300	627	164	969
60		25	0101	099	30N	02E	10	8A	3140603	2928242	0161483	9/24/1963	332	53	3600	648	6.9	883

EXHIBIT G-32

FARM WATER WELL DATA-ANCONA

WELL NO.	OWNER	DEPTH FEET	BACTERIA ANALYSIS	NITRATE ANALYSIS	GAS AT WELL		GAS IN SAMPLE	
					% LEL	% GAS	% LEL	% GAS
1	H. FORDYCE	40'	UNSATIS.	UNSATIS.	0	0	0	0
2	CLARK & SOLMAN	65'	UNSATIS.	UNSATIS.	0	0	0	0
3	HICKS BROS.	35'	SATIS.	UNSATIS.	0	0	0	0
4	W. COE	70'	UNSATIS.	UNSATIS.	0	0	0	0
5	E. HOOPER	25'	SATIS.	SATIS.	0	0	0	0
6	E. CLARK	40'	UNSATIS.	SATIS.	6	0	-	-
7	R. JACOBS	122'	UNSATIS.	SATIS.	0	0	0	0
8	R. JACOBS	30'	UNSATIS.	UNSATIS.	0	0	0	0
9	M. KRISCHEL	85'	SATIS.	SATIS.	0	0	0	0
10	M. KENNY	45'	UNSATIS.	SATIS.	0	0	0	0
11	FLAHAVEN	112'	SATIS.	SATIS.	0	0	100	20
12	FLAHAVEN	35'	UNSATIS.	SATIS.	0	0	0	0
15	B. MUSSER	126'	SATIS.	UNSATIS.	0	0	0	0
16	B. MUSSER	30'	UNSATIS.	UNSATIS.	0	0	0	0
17	B. MUSSER	28'	SATIS.	UNSATIS.	0	0	0	0
23	L. SASS	24'	UNSATIS.	SATIS.	0	0	0	0
24	L. SASS	22'	SATIS.	SATIS.	0	0	0	0
25	L. SASS	214'	UNSATIS.	SATIS.	0	0	0	0
27	D. CARLTON	35'	SATIS.	SATIS.	0	0	0	0
27A	D. CARLTON	45'	SATIS.	SATIS.	0	0	0	0
28	F. KIMPLING	45'	UNSATIS.	SATIS.	0	0	0	0
29	B. CULLEN	190'	UNSATIS.	SATIS.	100	45	50	35
30	B. CULLEN	28'	UNSATIS.	SATIS.	0	0	0	0
31	B. CULLEN	28'	UNSATIS.	SATIS.	0	0	0	0
32	I. SASS	85'	SATIS.	SATIS.	0	0	-	-
33	J. WHITE		UNSATIS.	SATIS.	-	-	-	-
34	M. HUDAK	32'	UNSATIS.	UNSATIS.	0	0	-	-
35	F. SMITH	27'	SATIS.	SATIS.	100	50	100	50
36	F. SMITH	15'	UNSATIS.	SATIS.	0	0	-	-
37	F. SMITH	90'			0	0	-	-
38	M. FEHR	18'	UNSATIS.	-	0	0	-	-
38A	M. FEHR	18'			0	0	-	-
39	A. FRY				-	-	-	-
40	A. SASS	28'			-	-	-	-
40A	A. SASS	103'			0	0	.45	0
41	F. BRENNAN	110'	UNSATIS.	-	0	0	0	0
42	F. KOVACEVICH	30'			0	0	-	-
42A	F. KOVACEVICH	20'	UNSATIS.	-	0	0	0	0
43	G. SIXT	25'	UNSATIS.	-	0	0	-	-
44	R. TALBOT		-	-	0	0	.8	-
45	G. PERISHOT	25'	UNSATIS.	-	0	0	-	-
45A	G. PERISHOT	200+'	-	UNSATIS.	0	0	-	-
47	WEBSTER	30'	UNSATIS.		-	-	-	-

R2E

R3E

T 30 N

T 29 N

24 19 20 21 22 23

25 30 29 28 27 26

36 31 32 33 34 35

1 6 5 4 3 2

12 7 8 9 10 11

ANCONA

LONG POINT

A. SASS (42) (44)

(1) M. KRISCHEL

(12) (11) FLAHAVEN

M. KENNY (10)

(33) J. WHITE

(43) G. SIXT

(4) W. COE

G. PERISHOT (42) (43)

F. KIMPLING (28)

I. SASS (32)

(38) (39) M. FEHR

(41) F. BRENNAN

B. CULLEN (31)

(29) B. CULLEN

M. HUDAK (36) (37)

WEBSTER

(44) R. TALBOT

(7) R. JACOBS

(8) R. JACOBS

E. CLARK (6)

(5) E. HOOPER

(2) CLARK & SOLMAN

(34) A. FRY

H. FOROYCE (1)

(42) (40) F. KOVACEVICH

(23) L. SASS

(24) L. SASS

L. SASS (24)

B. MUSSER (16) (17)

A-B. MUSSER

HICKS (3)

(26) (27) CARLTON

(34) F. SMITH

F. SMITH (31)

(35) F. SMITH

FARM WATER WELL LOCATION MAP

NORTHERN ILL. GAS CO.

TESTING PROGRAM

ANCONA

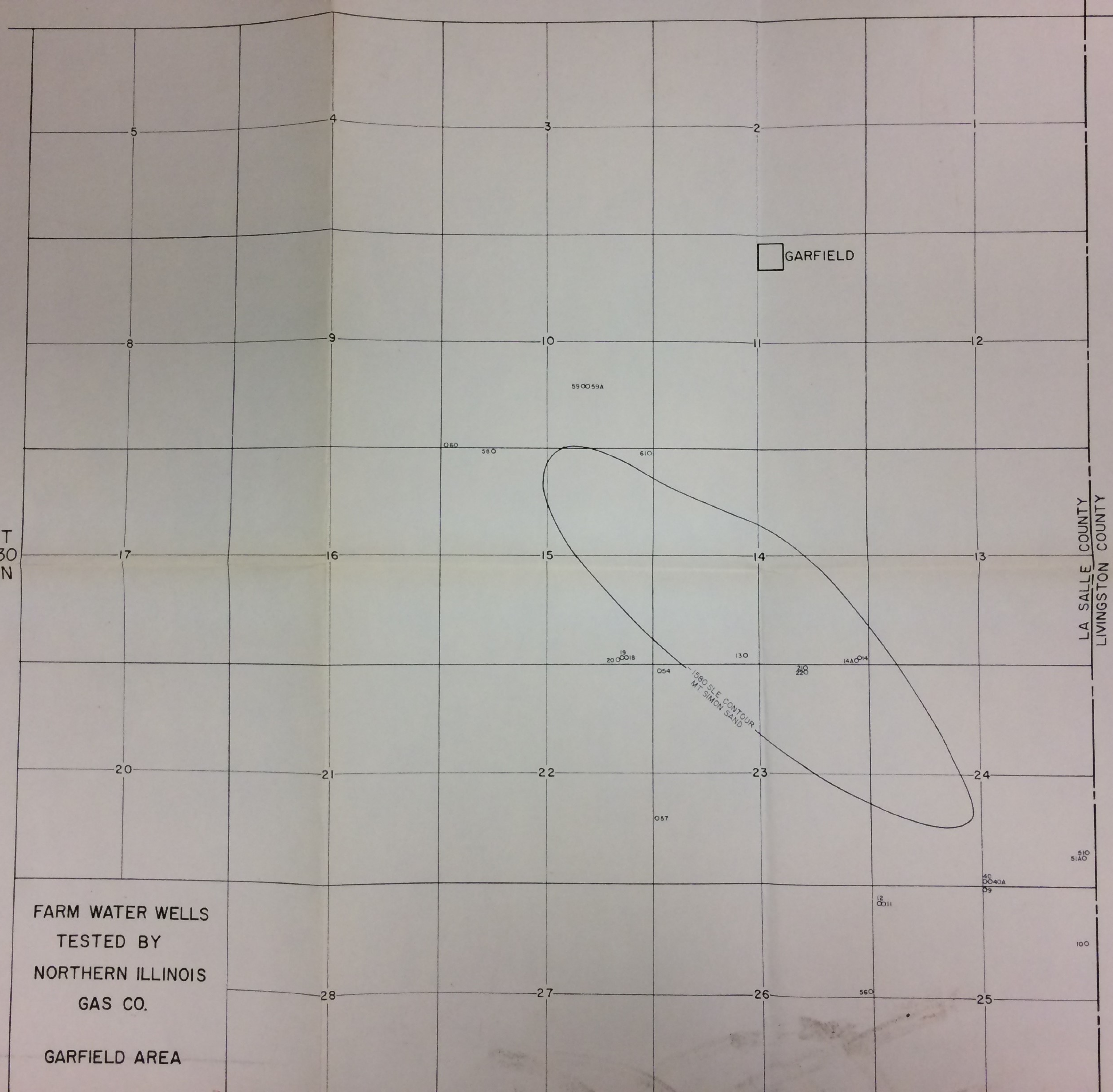
G-33

EXHIBIT G-33

FARM WATER WELL DATA—GARFIELD

EXHIBIT 31

WELL NO.	OWNER	DEPTH FEET	BACTERIA ANALYSIS	NITRATE ANALYSIS	COMBUSTABLE GAS AT WELL	COMBUSTABLE GAS IN GAS-WATER SAMPL
9	M. Krischel	85'	Satisfactory	Satisfactory	No	No
10	M. Kenney	45'	Unsatisfactory	Satisfactory	No	No
11	W. Flahaven	112'	Satisfactory	Satisfactory	No	Yes
12	W. Flahaven	35'	Unsatisfactory	Satisfactory	No	Yes
13	C. Stucker	30'	Unsatisfactory	Unsatisfactory	No	No
14	O. Scheuer	30'	Unsatisfactory	-	No	No
14A	O. Scheuer	25'	No Sample —	Well Dry	No	No
18	C. Barr	190'	Satisfactory	Satisfactory	Yes	Yes
19	C. Barr	30'	Unsatisfactory	Unsatisfactory	No	No
20	C. Barr	25'	Unsatisfactory	Unsatisfactory	No	No
21	J. Sullivan	30'	Unsatisfactory	Unsatisfactory	No	Yes
22	J. Sullivan	181'	Unsatisfactory	Unsatisfactory	No	No
40	C. Sass	28'	Unsatisfactory	Unsatisfactory	No	No
40A	C. Sass	103'	No Sample — Pump	Inoperative	No	Yes
41	F. Brennen	110'	Unsatisfactory	-	No	No
51	P. Ritchie	24'	Unsatisfactory	-	No	No
51A	P. Ritchie	92'	Unsatisfactory	-	No	No
52	E. Shay	200'	No Sample-Well	Abandoned	Yes	Yes
52A	E. Shay	120'	No Sample-Pump	Inoperative	No	No Sample
52B	E. Shay	120'	Satisfactory	Satisfactory	No	No
53	L. Andree	120'	Unsatisfactory	Satisfactory	No	Yes
53A	L. Andree	No. Info.	No Sample-Pump	Inoperative	No	No Sample
54	L. Love	25'	Satisfactory	Satisfactory	No	No
55	R. Garretson	30'	Satisfactory	Satisfactory	No	No
55A	R. Garretson	No. Info.	Unsatisfactory	-	Yes	Yes
55B	R. Garretson	30'	Unsatisfactory	-	No	No
55C	R. Garretson	No. Info.	No Sample-Pump	Inoperative	No	No Sample
56	E. Shay	30'	Unsatisfactory	-	No	No
57	L. Colehower	30'	Unsatisfactory	-	No	No
58	L. Selmeyer	No. Info.	Unsatisfactory	-	No	No
59	L. Selmeyer	No. Info.	Unsatisfactory	-	No	Yes
59A	L. Selmeyer	30'	Unsatisfactory	Unsatisfactory	No	No
60	T. Healy	25'	Unsatisfactory	-	No	No
61	C. Murray	No. Info.	No Sample-Pump	Inoperative	No	No Sample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LA SALLE COUNTY
LIVINGSTON COUNTY
19
20 18
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FARM WATER WELLS
TESTED BY
NORTHERN ILLINOIS
GAS CO.
GARFIELD AREA

TESTIMONY OF WENDELL D. CLEAVER

Q. Will you state your name and address?

A. Wendell D. Cleaver, 1831 Calhoun Street, Peru, Illinois.

Q. By whom are you employed?

A. Northern Illinois Gas Company.

Q. What are your principal duties with Northern Illinois Gas Company?

A. To supervise and be responsible for certain work in connection with the development and operation of the Company's underground gas storage projects. One of my primary duties involves supervising the drilling and completion of gas storage wells.

Q. Will you please summarize your educational background and experience for this work?

A. I attended the University of Illinois for three years, majoring in geology. I have also attended a two-week course on underground gas storage, conducted by Professor Donald L. Katz at the University of Michigan, and a well logging school conducted by Schlumberger Well Surveying Company for 2-1/2 years. I was employed by Magnet Cove Barium Corp., an oil field service company, as a sales and service engineer. I have also worked on oil well drilling rigs and completion units.

For about 2-1/2 years, as an employee of Northern Illinois Gas Company, I was in charge of the well completion work at the Company's Troy Grove underground gas storage facility. I also supervised the well completion work on the Company's proposed underground gas storage project near Crescent City.

Q. Did you supervise the well completion work on the Company's completed wells at the Ancona Field?

A. Yes. To date, Northern Illinois Gas Company has drilled and cased ten wells at Ancona. Of these, one is completed in the St. Peter formation, one is completed in the Galesville formation, one is completed in the Eau Claire formation, and seven are completed in the Mt. Simon formation.

Q. What was the purpose of the cementing operation on the Ancona Project completed wells?

A. After each well was drilled, a steel casing pipe smaller in diameter than the well bore, was placed in the hole from the surface of the ground to the bottom of the well. The purpose of the cementing operations was to place a barrier of cement, impermeable to gas, between the casing pipe and the well bore. This is necessary to prevent gas from migrating vertically from the reservoir through the space between the pipe and the hole.

Q. Is it necessary that all wells be cemented to the surface of the ground?

A. No. As long as the cement extends up into the formation which is impermeable to the migration of gas, the cement tops are high enough from the standpoint of leakage to the surface. By extending the cement to the surface added protection from corrosion is gained.

Q. How did you establish your cementing program?

A. The cementing program was based on our experience at Troy Grove and Crescent City and on recommendations of the Halliburton

Company. The Halliburton Company, which I believe is the recognized leader in this type of work for the oil and gas industry, recommended the cementing procedures which it deemed best suited for our use at Ancona.

Q. Did Northern Illinois Gas Company follow the recommendations of Halliburton Company?

A. Yes.

Q. With whom at Halliburton Company did you confer?

A. Mr. Fred Nussbaumer who is Assistant Division Manager and Division Engineer for Halliburton's Eastern Division discussed with us our cementing program for Ancona prior to the drilling of the first well at Ancona and periodically throughout the drilling period.

Q. Have you prepared a table which sets forth certain data with respect to the Company's well completion work at Ancona?

A. Yes.

(Mark Exhibit G-27 for identification.)

Q. Is Exhibit G-27 that table?

A. Yes. This table identifies the ten completed wells at Ancona, and for each well gives the following data: casing string, hole size, hole depth, casing size, casing depth, cement top, type, weight and amount of cement used, flushing data, number of centralizers, feet of scratchers, and perforated depths and formations.

Q. Will you please describe the well cementing procedures used by Northern Illinois Gas on the ten completed wells at Ancona?

A. The casing programs on these ten wells varied somewhat with the depth of each well, and the purpose of each well as between observation wells and injection-withdrawal wells.

Since the same basic procedures were used regardless of the casing sizes involved, I will describe in detail the procedures utilized on a well having a seven inch production casing and a 10-3/4 inch intermediate casing, and a 16 inch surface casing. To commence the operation a 20 inch hole was drilled to a depth of about 200 feet, which is about 10 feet into the Galena formation. A 16 inch outside diameter (OD) steel pipe was then placed in the hole from the surface of the ground to within 2 feet of the bottom of the hole. This is known as the surface casing.

Two centralizers were placed around the casing. These bands are designed to centralize the casing in the drill hole. One centralizer was placed near the bottom of the casing and the other near the middle of the casing. A guide shoe was placed on the bottom of the casing. The guide shoe was run to allow the casing to go into the hole freely.

After the casing had been placed in the desired position, drilling mud was circulated for about 30 minutes. This procedure consists of pumping the drilling mud down the inside of the casing and up the annulus between the casing and well bore. This was done to condition the hole for a good cement job.

With the hole properly conditioned the cementing operation commenced with Halliburton equipment pumping ten barrels of water into the casing behind the mud. The water was

followed by cement which was mixed and pumped by Halliburton pumps. The cement was pumped into the casing and then displaced out of the casing and into the space between the casing and well bore. As a result, the pipe was in place with a sheath of cement around the outside of the casing binding it to the well hole.

After allowing the cement to set for a minimum of 18 hours, the drilling was resumed using a 13-3/4 inch bit to drill a hole to about 2100 feet, which is approximately 200 feet into the Eau Claire formation. A 10-3/4 inch OD steel pipe was then inserted into this hole. This casing string is known as the intermediate casing.

Fifteen centralizers were placed on this casing along with 15 feet of rotating type scratchers. These scratchers clean the wall of the well hole, in order to improve the bond of the cement to the well bore. These scratchers were located in the good basal Eau Claire shale. A guide shoe was placed on the bottom of the casing and a float collar was placed 30 feet above the bottom of the casing. This guide shoe prevented the cement from coming back into the casing after it had been pumped into place.

With the casing in place, drilling mud was circulated and the casing rotated for 30 minutes to condition the hole. Twenty barrels of wash fluid were then pumped into the casing to help flush the drilling mud out of the hole. The cement was then mixed and pumped using Halliburton pump trucks. Pumping pressures in the range of 750 psi at the pumps were reached during the normal cementing operation. Sufficient

cement was mixed to circulate an excess amount of cement back to surface. The cement volumes were calculated using a Caliper Log giving the actual hole sizes. The result is a sheath of cement from the bottom of the hole to the surface of the ground.

This cement was allowed to set for 48 hours at which time drilling commenced using a 9-7/8 inch bit to drill a hole to the desired depth in the Mt. Simon.

A 7 inch OD steel pipe was run in this hole. This is known as the production casing. Twenty-five feet of rotating type scratchers and 15 centralizers were placed on the casing. These scratchers were located in the good basal Eau Claire shale. A guide shoe was run on the bottom of the casing and an automatic fill-up float collar was run 30 feet above the bottom of the pipe.

The casing was circulated with mud and rotated for 30 minutes prior to the cementing operation. Twenty barrels of wash solution were run ahead of the cement and the cement was mixed and displaced using two Halliburton pump trucks. The volume of cement was calculated from the Caliper Log to allow an excess of 75 sacks to be pumped out in addition to filling the space between the casing and well bore.

This program was recommended by the Halliburton Company.

Q. Will you please describe the type of cement that was utilized in cementing the production casing?

A. Exhibit G-27 lists the type of cement run on all the casing strings at Ancona. The cement utilized on the production casing was a dry, pre-mixed bulk cement provided by Halliburton.

The cement is known as Regular Pozmix with .8% Halad No. 9; it consists of 50% High Early cement, 50% Pozzolan, with 2" Bentonite and 0.8% Halad No. 9 added. The Halad No. 9 is a water loss reducing agent. The cement was run at a weight range of 14.2-14.7 lbs./gal. with the first part of the cement being at the lighter weight range. This was in accord with the program outlined by Halliburton.

Q. Were all the wells cemented from the bottom of the casing to the surface of the ground?

A. Exhibit G-27 lists the cement tops on the wells. Cement circulated to surface on seven of the wells. The cement tops on the other wells are all less than 680 feet from the surface of the ground.

Q. What method did you use to determine the condition of the casing and the cement after the casing is cemented in the drill hole?

A. We used several methods. (1) The casing and wellhead were first tested to about 750 psi wellhead pressure. (2) During the completion operation all the fluid was removed from the casing. The entry of fluid through a fault in the casing would have been detected at this time. (3) A magnetic tool was used to locate the casing collars during the perforating operation. Any noticeable change in the metal quantity in the casing would have shown up during this operation. (4) During the completion of the well, various tools, slightly smaller in diameter than the casing were run in the casing. If there were any restrictions in the casing, the movement of these tools would have been obstructed.

No faults or leaks in the deep well casings were found at Ancona by any of these methods.

A cement bond log was run on all the intermediate casing strings except on Krischel No 2 well; such a log was also run on all of the production casing strings. This log is designed to point out imperfections in the continuity of the cement sheath. No major imperfections were revealed by these logs.

Q. Were water samples taken for analysis from each of the Company's completed wells at the Ancona Field?

A. Yes. On each of the completed wells except Fordyce No. 4 well, the samples were collected while the well was being swabbed, after perforation. The sample on Fordyce No. 4 well was collected during the water pumping tests that I will describe shortly.

Q. Were the samples collected under your supervision?

A. Six of the ten samples were collected by me or by the people working under my supervision. Mr. James Clayton of Bradford Laboratories, the independent laboratory that performed water analysis tests on this project, collected the other four water samples.

Q. Did Northern Illinois perform water pumping tests on certain wells at the Ancona Field?

A. Yes. The field work in connection with these tests was conducted under my supervision.

Q. Will you please describe these pumping tests?

A. In this test we pumped water at a rate of 80 gallons per minute out of Fordyce No. 4 well, which is completed in the Mt. Simon formation. The test began on November 1, 1962, and ran to December 19, 1962. Each of the nine other completed wells at the Ancona Field was equipped with a continuous fluid level recorder which recorded the fluid level in the well. In connection with this test, we also took readings on our recording barometer located at Streator, Illinois, about eleven miles from the Ancona project.

Q. Have you prepared certain plots which show the recorded fluid levels in certain wells and the recorded barometric pressure for the period of the pumping test and the periods immediately before and immediately after the pumping tests?

A. Yes.

(Mark Exhibits G-28, G-29 and G-30 for identification.)

Q. Are Exhibits G-28, G-29 and G-30 these plots?

A. Yes. Exhibit G-28 shows the fluid level elevations for all of the Mt. Simon wells other than the well being pumped, and the barometric pressure readings. Exhibit G-29 shows the fluid level elevations of Clark No. 1 well, which is completed in the St. Peter formation and Fordyce No. 3 well, which is completed in the Galesville formation and the barometric pressure readings. Exhibit G-30 shows the fluid level elevations in the Clark No. 1, and Fordyce No. 3 wells corrected for the effects of the barometric pressure changes during the period in question.

Q. Have you prepared a table showing the fluid level measurements and barometer readings taken at given times during the water pumping tests on all of the completed wells at Ancona?

A. Yes.

(Mark Exhibit G-31 for identification.)

Q. Is Exhibit G-31 that table?

A. Yes.

Q. Has an additional water pumping test been performed by Northern Illinois at the Ancona Field?

A. Yes. On January 15, 1963, we began a water pumping test which involved pumping the Fordyce No. 1 well. The final results of this test, however, were not available in time to be tabulated and graphically presented in this hearing.

Q. Did Northern Illinois Gas Company collect water samples from the farm water wells in the area of the Ancona Field?

A. Yes. We collected data on all of the farm water wells in the immediate area of the Ancona Field and collected water samples on each well. We sent one sample from each well to the Illinois State Water Survey for chemical analysis, and another sample from each well to the Illinois Department of Health for bacteria analysis. We also tested each well for the presence of native gas and when the gas volume present was high enough, obtained a sample which we sent to the Institute of Gas Technology for analysis. All of this work was done under my supervision.

Q. Have you prepared a table which shows the farm water wells which Northern Illinois had checked in the immediate area of the Ancona Field?

A. Yes.

(Mark Exhibit G-32 for identification.)

Q. Is Exhibit G-32 that table?

A. Yes. It shows the well owner's name, the depth of the well, the results of the bacteria analysis and the nitrate analysis, and also the percentage of gas measured at each well, and percentage of gas measured in the water samples that we obtained from each well.

Q. Have you prepared a map which shows the location of the farm water wells which were thus tested by Northern Illinois Gas Company?

A. Yes.

(Mark Exhibit G-33 for identification.)

Q. Is Exhibit G-33 that map?

A. Yes.

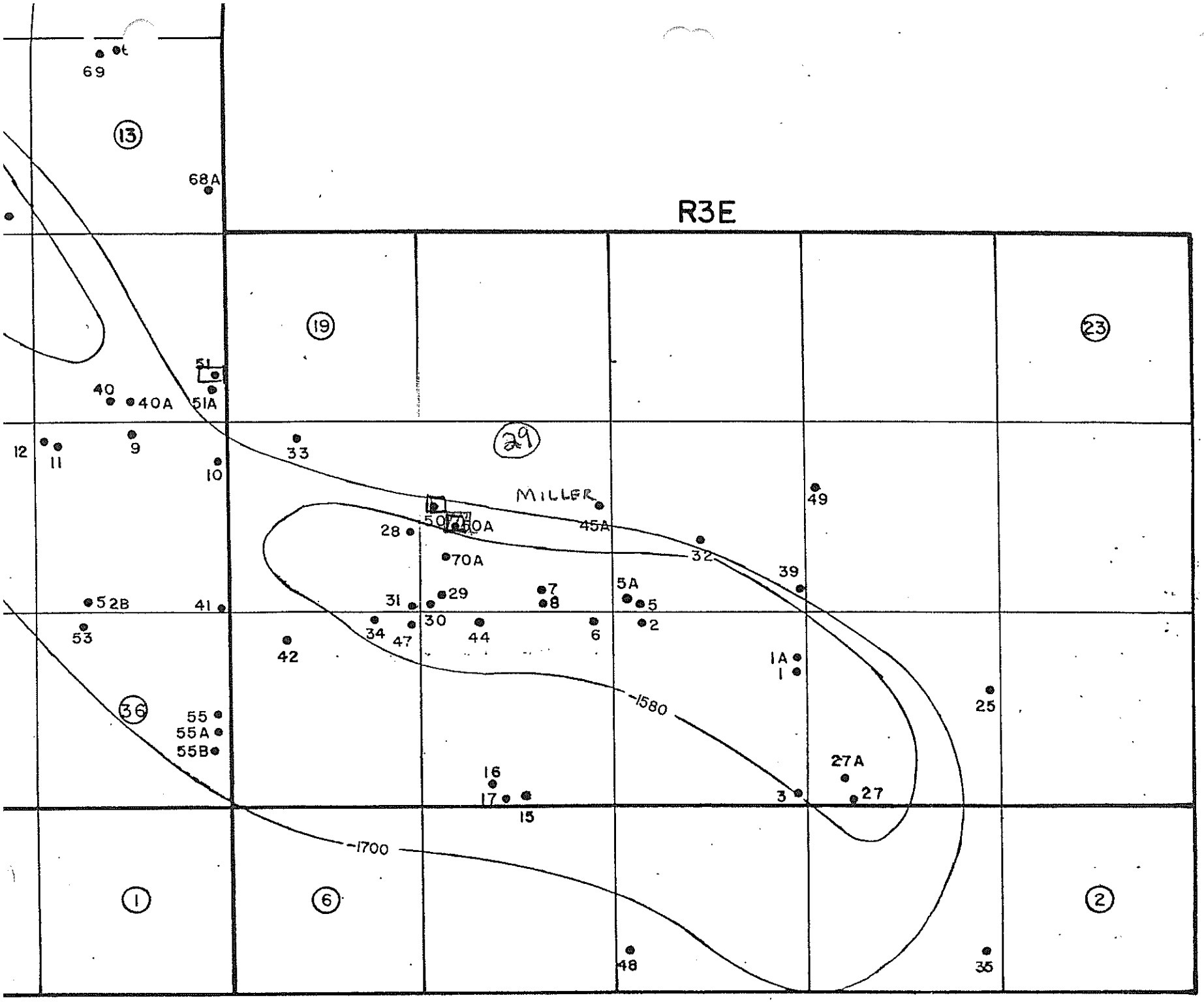
Q. Was the temperature of the subsurface formations at Ancona measured under your supervision?

A. Yes. I have prepared a plot showing the general temperature vs. depth at the Ancona Field.

(Mark Exhibit G-34 for identification.)

Q. Is Exhibit G-34 that plot?

A. Yes.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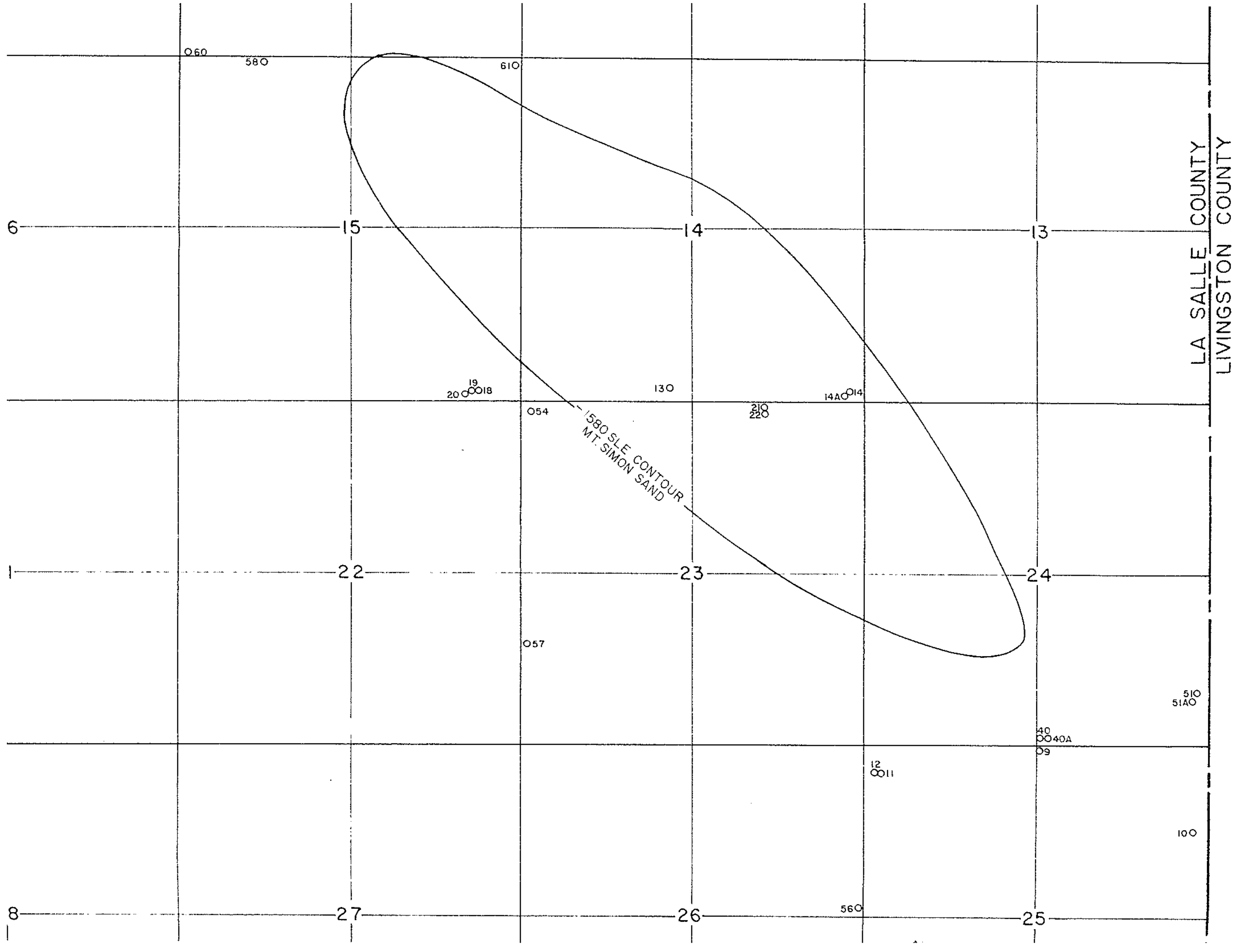
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MT. SIMON SAND
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sp, NO_3

February 27, 1963

LIV29N3E-3.1b

PARTIAL CHEMICAL ANALYSIS

Sample no. 35 of water collected October 25, 1962 from a well owned by Flora Smith near Ancona, Illinois in Livingston County. Location of well: 950'N and 450'W of the SE corner of Section 3, T29N, R3E. Depth of well: 127 feet.
Date drilled: 1910. Casing record: 4" S

LABORATORY No. 158972

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.9		Chloride	Cl	36.	1.02
			Nitrate	NO_3	3.6	.06
			Alkalinity	(as $CaCO_3$)	756.	15.12
Turbidity	7		Hardness	(as $CaCO_3$)	96.	1.92
Color	20					
Odor	Ds		Total Dissolved Minerals		894	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

P278352

sp, NO_3

February 27, 1963

LIV29N3E-3.2b

PARTIAL CHEMICAL ANALYSIS

Sample No. 36 of water collected October 25, 1962 from a well owned by Flora Smith near Ancona, Illinois in Livingston County. Location of well: 1000'N and 900'W of the SE corner of Section 3, T29N, R3E. Depth of well: 15 D feet. Date drilled: 1900. Casing record: 1 1/4"

LABORATORY No. 158973

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	1.3		Chloride	Cl	1.	.03
			Nitrate	NO_3	7.4	.12
			Alkalinity	(as $CaCO_3$)	16.	.32
Turbidity	10		Hardness	(as $CaCO_3$)	38.	.76
Color	0					
Odor	M		Total Dissolved Minerals		66	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

August [illegible], 1962

LIV30N3E-25.5h

PARTIAL CHEMICAL ANALYSIS

Sample No. 9 of water collected June 14, 1962 from a well owned by Math Krieckel near Ancona, Illinois in Livingston County. Location of well: 2640'S and 25'W of the NE corner of Section 25, 30N, 2E. Depth of well: 45 feet.
Date drilled: 1958 Casing Record: 3"

3E S

LABORATORY No. 157786

	ppm.	epm.			ppm.	epm.
Iron (total) Fe	6.3		Chloride	Cl	11.	.31
			Nitrate	NO_3	20.4	.33
			Alkalinity	(as $CaCO_3$)	308.	6.16
Turbidity	25		Hardness	(as $CaCO_3$)	770.	15.40
Color	5		Total Dissolved Minerals		1321	
Odor	0					

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/mr

sp, NO_3

February 19, 1963

LIV30N3E-27.8d

PARTIAL CHEMICAL ANALYSIS

Sample No. 38 of water collected from a well owned by Mr. Milton Fehr near Ancona, Illinois in Livingston County. Location of well: 2600'N and 150'E of the SW corner of Section 27, T30N, R3E. Depth of well: 18 feet. Date drilled: 1900 Dug well. Formation: drift

LABORATORY No. 158974

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.6		Chloride	Cl	60.	1.69
			Nitrate	NO_3	438.0	7.05
			Alkalinity	(as $CaCO_3$)	332.	6.64
Turbidity	4		Hardness	(as $CaCO_3$)	1160.	23.20
Color	0					
Odor	0		Total Dissolved Minerals		1656	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Henley
Associate Chemist

LHH/ar

sp, NO_3

N. I. S. Co. (4 copies)

May 16, 1963

L1V30N3E-27.8e

PARTIAL CHEMICAL ANALYSIS

Sample No. 49 of water collected May 1, 1963 from a well owned by Miss Konrath near Ancona, Illinois in Livingston County. Location of well: 660'N and 350'E of the SW corner of the NW 1/4 of Section 27, T30N, R3E. Depth of well: 75 feet.

S

LABORATORY No. 160116

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	1.6		Chloride	Cl	3.	.09
			Nitrate	NO_3	5.7	.09
			Alkalinity	(as $CaCO_3$)	326.	6.52
Turbidity	6		Hardness	(as $CaCO_3$)	156.	2.12
Color	0					
Odor	0		Total Dissolved Minerals		340	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sv

Duncan

Sp, NO_3

February 27, 1963

LIV30N3E-28.5d

PARTIAL CHEMICAL ANALYSIS

Sample No. 32 of water collected October 19, 1962 from a well owned by Ida Sass near Ancona, Illinois in Livingston County. Location of well: 2400'E and 2300'N of the SW corner of Section 28, T30N, R3E. Depth of well: 85 feet. Date drilled: 1939
Casing record: 6"

S -

LABORATORY No. 158969

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	2.5		Chloride	Cl	1.	.03
			Nitrate	NO_3	4.2	.07
			Alkalinity	(as $CaCO_3$)	468.	9.36
Turbidity	24		Hardness	(as $CaCO_3$)	330.	6.60
Color	5					
Odor	0		Total Dissolved Minerals		478	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/er

V

August 20, 1962

LIV 30N 3E - 28.7h

PARTIAL CHEMICAL ANALYSIS

Sample No. 4 of water collected June 5, 1962 from a well owned by Mrs. Roland Ringer near Ancona, Illinois in Livingston County. Location of well: 1140'E and 200'S of the NW corner of Section 28, T30N, R3E. Depth of well: 70 feet. Date drilled: 1910. Elev. above sea level top of well: 635' Size hole: 4' Casing record: 1 1/4 - 50

S

LABORATORY No. 15793

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.2		Chloride	Cl	50.	1.64
			Nitrate	NO_3	330.	4.97
			Alkalinity	(as $CaCO_3$)	200.	4.00
Turbidity	0		Hardness	(as $CaCO_3$)	556.	11.12
Color	0					
Odor	0		Total Dissolved Minerals		907	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Bonley
Associate Chemist

LHB/sr

V

August 20, 1962

LIV30N3E-28.8a

PARTIAL CHEMICAL ANALYSIS

Sample No. 5 of water collected June 14, 1962 from a well owned by Dave Hooper near Lucerne, Illinois in Livingston County. Location of well: 150'S and 500'E of the NW corner of Section 28, T30N, R3E. Depth of well: 25 feet.

Date drilled: 1900 Elev. above sea level top of well: 635.

Size hole: 4" 1 1/4 Distance to water when not pumping: 15'

LABORATORY No. 157962 D

	PPM.	EPM.			PPM.	EPM.
Iron(total) Fe	0.1		Chloride	Cl	7.	.20
			Nitrate	NO_3	38.0	.62
			Alkalinity	(as $CaCO_3$)	230.	4.72
Turbidity	0		Hardness	(as $CaCO_3$)	382.	7.64
Color	0					
Odor	0		Total Dissolved Minerals		401	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

WATER SURVEY DIVISION

Laurel F. Monley
Associate Chemist

LFM/sr

Sp, NO3

February 21, 1963

LIV30N3E-29.1e1

PARTIAL CHEMICAL ANALYSIS

Sample No. 45 of water collected from a well owned by Mr. G. Perishot near Ancona, Illinois in Livingston County. Location of well: 2000'S and 100'W of the NE corner of Section 29, T30N, R3E. Depth of well: Approx. 25 feet.

D

LABORATORY No. 159102

		ppm.	epm.			ppm.	epm.
Iron(total)	Fe	0.1		Chloride	Cl	155.	4.37
				Nitrate	NO_3	138.9	2.24
				Alkalinity	(as $CaCO_3$)	416.	8.32
Turbidity		2		Hardness	(as $CaCO_3$)	1085.	21.70
Color		0					
Odor		0		Total Dissolved Minerals		1746	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

P279-?17

sp, NO_3

February 21, 1963

LIV30N3E-29.1e2

PARTIAL CHEMICAL ANALYSIS

Sample No. 45A of water collected from a well owned by Mr. G. Perishot near Amoona, Illinois in Livingston County. Location of well: 2000'S and 175'W of the NE corner of Section 29, T30N, R3E. Depth of well: Approx 200 feet.

S

LABORATORY No. 154103

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	tr.		Chloride	Cl	175.	4.94
			Nitrate	NO_3	53.8	.87
			Alkalinity	(as $CaCO_3$)	336.	6.72
Turbidity	2		Hardness	(as $CaCO_3$)	828.	16.56
Color	0					
Odor	0		Total Dissolved Minerals		1200	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Henley
Associate Chemist

LHH/sr

V

P2739418

August 21, 1962

LIV30N3E-29.4a1

PARTIAL CHEMICAL ANALYSIS

Sample No. 7 of water collected June 14, 1962 from a well owned by Mr. Russell Jacobs near Ancona, Illinois in Livingston County. Location of well: 2480'W and 200'N of the SE corner of Section 29, T30N, R3E. Depth of well: 122 feet. Date drilled: 1953. Elev. above sea level top of well: 645

Casing Record: 4"

5

LABORATORY No. 157984

	ppm.	epm.			ppm.	epm.
Iron (total) Fe	0.3		Chloride	Cl	75.	2.12
			Nitrate	NO_3	58.7	.95
			Alkalinity	(as $CaCO_3$)	324.	6.48
Turbidity	0		Hardness	(as $CaCO_3$)	635.	12.70
Color	0					
Odor	0		Total Dissolved Minerals		858	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

P2-8'94/01

August 21, 1962

LIV30N3E-29.4a2

PARTIAL CHEMICAL ANALYSIS

Sample No. 8 of water collected June 14, 1962 from a well owned by Mr. Russell Jacobs near Ancona, Illinois in Livingston County. Location of well: 2400'W and 125'N of the SE corner of Section 29, T30N, R3E. Depth of well: 30 feet. Date drilled: 1885. Elev. above sea level top of well: 645
Size hole: 4' Casing Record: 3" Distance to water when not pumping: 16'

LABORATORY No. 157985 D

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	1.2		Chloride	Cl	145.	4.09
			Nitrate	NO_3	275.	4.43
			Alkalinity	(as $CaCO_3$)	368.	7.36
Turbidity	2		Hardness	(as $CaCO_3$)	1140.	22.80
Color	5					
Odor	0		Total Dissolved Minerals		1908	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

V

sp, NO_3

February 21, 1963

LIV30N3E-29.8a1

PARTIAL CHEMICAL ANALYSIS

Sample No. 29 of water collected October 18, 1962 from a well owned by Bertha Cullen near Ancona, Illinois in Livingston County. Location of well: 100'N and 150'E of the SW corner of Section 29, T30N, R3E. Depth of well: 190 feet. Date drilled: 1947. Casing record: 8"

S

LABORATORY No. 158966

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	3.8		Chloride	Cl	285.	8.04
			Nitrate	NO_3	1.4	.02
			Alkalinity	(as $CaCO_3$)	2120.	42.40
Turbidity	7		Hardness	(as $CaCO_3$)	68.	1.36
Color	25					
Odor	Mu		Total Dissolved Minerals		2742	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

P2742

July 1, 1963

LIV30N3E-29.8a

PARTIAL CHEMICAL ANALYSIS

Sample of water collected June 4, 1963 from a well owned by the Northern Illinois Gas Company near Ancona, Illinois in Livingston County. Location of well: Approx. 100'N and 100'E of the SW corner of Section 29, T30N, R3E. Depth of well: 190 feet.

S

LABORATORY No. 160422

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	2.0		Chloride	Cl	280.	7.90
			Nitrate	NO_3	3.	.00
			Alkalinity	(as $CaCO_3$)	2120.	42.40
Turbidity	?		Hardness	(as $CaCO_3$)	64.	1.28
Color	0					
Odor	0		Total Dissolved Minerals 2739			

ppm. = parts per million
epm. = equivalents per million
ppm. x .058 = grains per gallon

STATE WATER SURVEY DIVISION

T. E. Larson
Head, Chemistry Section

TEL/sv

V

sp, NO_3

February 26, 1963

LIV30N3E-29.8a2

PARTIAL CHEMICAL ANALYSIS

Sample No. 30 of water collected October 18, 1962 from a well owned by B. A. Culleen near Ancona, Illinois in Livingston County. Location of well: 95'N and 145'E of the SW corner of Section 29, T30N, R3E. Depth of well: 28 feet. Date drilled: 1922. Casing record: 1 1/4"

D

LABORATORY No. 158967

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.8		Chloride	Cl	12.	.34
			Nitrate	NO_3	1.3	.02
			Alkalinity	(as $CaCO_3$)	388.	7.76
Turbidity	5		Hardness	(as $CaCO_3$)	362.	7.24
Color	5					
Odor	0		Total Dissolved Minerals		547	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

D

sp, NO_3

V. I. C. Co. (4 copies)

May 16, 1963

LIV30N3E-29.8e1

PARTIAL CHEMICAL ANALYSIS

Sample No. 50 of water collected May 1, 1963 from a well owned by Mr. Richard Miller near Ancona, Illinois in Livingston County. Location of well: 600'N and 75'E of the SW corner of the NW 1/4 of Section 29, T30N, R3E. Depth of well: 87 feet.

LABORATORY No. 160117

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	1.5		Chloride	Cl	104.	2.93
			Nitrate	NO_3	0.7	.01
			Alkalinity	(as $CaCO_3$)	980.	19.60
Turbidity	12		Hardness	(as $CaCO_3$)	140.	2.80
Color	0					
Odor	0		Total Dissolved Minerals		1187	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Hanley
Associate Chemist

LMH/sv

sp, NO_3

LIV30N3E-29.8e2

PARTIAL CHEMICAL ANALYSIS

Sample No. 30A of water collected May 1, 1963 from a well owned by Mr. Richard Miller near Ancona, Illinois in Livingston County. Location of well: 500'N and 150'E of the SW corner of the NW 1/4 of Section 29, T30N, R3E. Depth of well: 52 feet.

LABORATORY No. 160113

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.4		Chloride	Cl	14.	.39
			Nitrate	NO_3	45.2	.73
			Alkalinity	(as $CaCO_3$)	240.	4.80
Turbidity	5		Hardness	(as $CaCO_3$)	356.	7.12
Color	0					
Odor	0		Total Dissolved Minerals		427	

ppm. = parts per million
epm. = equivalents per million
ppm. x .058 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Conley
Associate Chemist

LMC/sv

sp, NO_3

February 26, 1963

LIV 30N3E-30.1a

PARTIAL CHEMICAL ANALYSIS

Sample No. 31 of water collected October 18, 1962 from a well owned by B. A. Culleen near Ancona, Illinois in Livingston County. Location of well: 100'W and 100'N of the SE corner of Section 30, T30N, R3E. Depth of well: 28 feet. Date drilled: 1926. Casing record: 1 1/4"

D

LABORATORY No. 158968

		ppm.	epm.			ppm.	epm.
Iron(total)	Fe	1.1		Chloride	Cl	24.	.68
				Nitrate	NO_3	4.5	.07
				Alkalinity	(as $CaCO_3$)	524.	10.48
Turbidity		13		Hardness	(as $CaCO_3$)	402.	8.04
Color		5					
Odor		0		Total Dissolved Minerals		746	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

✓

P278950

Sp, NO_3

February 21, 1963

LIV30N3E-30.1d

PARTIAL CHEMICAL ANALYSIS

Sample No. 28 of water collected October 18, 1962 from a well owned by Mr. Frank Kimpling near Ancona, Illinois in Livingston County. Location of well: 2600'N and 300'W of the SE corner of Section 30, T30N, R3E. Depth of well: 45 feet. Date drilled: 1918

LABORATORY No. 158965

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.3		Chloride	Cl	17.	.48
			Nitrate	NO_3	2.9	.05
			Alkalinity	(as $CaCO_3$)	384.	7.68
Turbidity	2		Hardness	(as $CaCO_3$)	426.	8.52
Color	5					
Odor	0		Total Dissolved Minerals		535	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

D078609

Sp, NO_3

February 27, 1963

LIV30N3E-30.3h

PARTIAL CHEMICAL ANALYSIS

Sample No. 43 of water collected from a well owned by Mr. George Sixt near Ancona, Illinois in Livingston County. Location of well: 1325'W and 100'S of the NE corner of Section 30, T30N, R3E. Depth of well: Approx. 25 feet.

D

LABORATORY No. 159100

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.1		Chloride	Cl	9.	.25
			Nitrate	NO_3	1.9	.03
			Alkalinity	(as $CaCO_3$)	312.	6.24
Turbidity	4		Hardness	(as $CaCO_3$)	454.	9.08
Color	0					
Odor	0		Total Dissolved Minerals		300	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Henley
Associate Chemist

LHH/ar

✓

P278960

sp, NO_3

February 27, 1963

LIV30N3E-30.5h

PARTIAL CHEMICAL ANALYSIS

Sample No. 33 of water collected October 19, 1962 from a well owned by Wilfren Kenner near Ancona, Illinois in Livingston County. Location of well: 2000'E and 250'S of the NW corner of Section 30, T30N, R3E. Depth of well: 30 feet.
Date drilled: 1900 D

LABORATORY No. 158970

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	2.8		Chloride	Cl	10.	.28
			Nitrate	NO_3	5.2	.08
			Alkalinity	(as $CaCO_3$)	220.	4.40
Turbidity	11		Hardness	(as $CaCO_3$)	394.	7.88
Color	5					
Odor	0		Total Dissolved Minerals		861	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

D2-0001

sp, NO_3

February 19, 1963

LIV30N3E-31.1h1

PARTIAL CHEMICAL ANALYSIS

Sample No. 34 of water collected October 19, 1962 from a well owned by Mr. Mike Hudak near Ancona, Illinois in Livingston County. Location of well: 100'W and 125'S of the NE corner of Section 31, T30N, R3E. Depth of well: 32 feet.
Date drilled: 1910. Casing record: 1 1/4 D

LABORATORY No. 158971

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	1.0		Chloride	Cl	73.	2.06
			Nitrate	NO_3	140.0	2.25
			Alkalinity	(as $CaCO_3$)	212.	4.24
Turbidity	9		Hardness	(as $CaCO_3$)	630.	12.60
Color	5					
Odor	0		Total Dissolved Minerals		1125	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Denley
Associate Chemist

LMH/ar

P17962

February 27, 1963

LIV30N3E-31.1h2

PARTIAL CHEMICAL ANALYSIS

Sample No. 47 of water collected from a well owned by Mrs. Webster near Ancona, Illinois in Livingston County. Location of well: 75'W and 75'S of the NE corner of Section 31, T30N, R3E. Depth of well: Approx. 30 feet.

D

LABORATORY No. 159104

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.2		Chloride	Cl	3.	.08
			Nitrate	NO3	10.6	.17
			Alkalinity	(as CaCO3)	248.	4.96
Turbidity	4		Hardness	(as CaCO3)	290.	5.80
Color	0					
Odor	0		Total Dissolved Minerals		340	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/er

L

February 21, 1963

LIV30N3E-31.7g

PARTIAL CHEMICAL ANALYSIS

Sample No. 424 of water collected from a well owned by Mr. F. Kovacevich near Ancona, Illinois in Livingston County. Location of well: 1300'S and 750'E of the NW corner of Section 31, T30N, R3E. Depth of well: Approx. 20 feet.
Date drilled: approx 1900

LABORATORY No. 159099

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.1		Chloride	Cl	49.	1.38
			Nitrate	NO_3	54.3	.87
			Alkalinity	(as $CaCO_3$)	370.	7.40
Turbidity	4		Hardness	(as $CaCO_3$)	750.	15.00
Color	0					
Odor	0		Total Dissolved Minerals 1094			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Henley
Associate Chemist

LHH/er

August 21, 1962

LIV30N3E-32.1h

PARTIAL CHEMICAL ANALYSIS

Sample No. 6 of water collected June 14, 1962 from a well owned by S. Clark near Ancona, Illinois in Livingston County. Location of well: 200'S and 600'W of the NE corner of Section 32, T30N, R3E. Depth of well: 40 feet.

Date drilled: 1875

5

LABORATORY No. 157903

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.6		Chloride	Cl	40.	1.13
			Nitrate	NO_3	450.	7.25
			Alkalinity	(as $CaCO_3$)	252.	5.04
Turbidity	2		Hardness	(as $CaCO_3$)	781.	15.62
Color	0					
Odor	0		Total Dissolved Minerals 1262			

ppm. = parts per million
epm. = equivalents per million
ppm. x .058 = grains per gallon

STATE WATER SURVEY DIVISION

Samuel K. Henley
Associate Chemist

SKH/er

Done

August 21, 1962

LIV 30N 3E-32.4a

PARTIAL CHEMICAL ANALYSIS

Sample No. 15 of water collected June 13, 1962 from a well owned by D. Fusser near Ancona, Illinois in Livingston County. Location of well: 150'E and 100'S of the NW corner of the NW 1/4 of the NE 1/4 of Section 32, T30N, R3E.
Depth of well: 126 feet. Date drilled: 1900. Casing record: 3"

S

LABORATORY No. 157992

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.2		Chloride	Cl	125.	3.53
			Nitrate	NO_3	193.	3.11
			Alkalinity	(as $CaCO_3$)	388.	7.76
Turbidity	Tr.		Hardness	(as $CaCO_3$)	896.	17.92
Color	10					
Odor	0		Total Dissolved Minerals		1250	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel T. Henley
Associate Chemist

LTH/ar

V

sp, NO_3

February 27, 1963

LIV 30N 3E-32.7h

PARTIAL CHEMICAL ANALYSIS

Sample No. 44 of water collected from a well owned by Mr. R. Talbot near Ancona, Illinois in Livingston County. Location of well: 1250'E and 225'S of the NW corner of Section 32, T30N, R3E. Depth of well: Approx. 100 feet.

LABORATORY No. 159101

		ppm.	epm.			ppm.	epm.
Iron(total)	Fe	Tr.		Chloride	Cl	87.	2.45
				Nitrate	NO_3	13.8	.22
				Alkalinity	(as $CaCO_3$)	1120.	22.40
Turbidity		2		Hardness	(as $CaCO_3$)	140.	2.80
Color		0					
Odor		0		Total Dissolved Minerals		1388	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/er

August 21, 1962

LIV30N3E-32.8a1

PARTIAL CHEMICAL ANALYSIS

Sample No. 16 of water collected June 13, 1962 from a well owned by B. Musser near Ancona, Illinois in Livingston County. Location of well: 100'N and 100'E of the SW corner of Section 32, T30N, R3E. Depth of well: 30 feet.

Date drilled: 1890. Size hole: 1 1/4"

D

LABORATORY No. 157993

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	3.1		Chloride	Cl	30.	.85
			Nitrate	NO3	97.5	1.57
			Alkalinity	(as CaCO3)	256.	5.12
Turbidity	5		Hardness	(as CaCO3)	486.	9.72
Color	5					
Odor	0		Total Dissolved Minerals		685	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Hanley
Associate Chemist

LHH/ar

August 21, 1962

LIV30N3E-32.8a2

PARTIAL CHEMICAL ANALYSIS

Sample No. 17 of water collected June 13, 1962 from a well owned by B. Musser near Ancona, Illinois in Livingston County. Location of well: 75'E and 75'N of the SW corner of Section 32, T30N, R3E. Depth of well: 22 feet.
Casing Record: 1 1/4"

D

LABORATORY No. 157944

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	2.5		Chloride	Cl	35.	.99
			Nitrate	NO_3	95.2	1.53
			Alkalinity	(as $CaCO_3$)	260.	5.20
Turbidity	4		Hardness	(as $CaCO_3$)	488.	9.76
Color	5					
Odor	0		Total Dissolved Minerals		639	

ppm. = parts per million
epm. = equivalents per million
ppm. x .7543 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/ar

August 20, 1962

LIV30N3E-33.1a

PARTIAL CHEMICAL ANALYSIS

Sample No. 3 of water collected from a well owned by Hicks Brothers near Ancona, Illinois in Livingston County. Location of well: 150'W and 200'N of the SE corner of Section 33, T30N, R3E. Depth of well: 35 feet. Date drilled: 1880 Elev. above sea level top of well: ~~635~~. Size hole: 6" Casing record: 1 1/4 to 30' Distance to water when not pumping: 18'

LABORATORY No. 157900

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.2		Chloride	Cl	110.	3.10
			Nitrate	NO_3	415.	6.68
			Alkalinity	(as $CaCO_3$)	324.	6.48
Turbidity	13		Hardness	(as $CaCO_3$)	867.	17.34
Color	0					
Odor	0		Total Dissolved Minerals 1106			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

August 20, 1962

LIV30N3E-33.1g

PARTIAL CHEMICAL ANALYSIS

Sample No. 1 of water collected June 11, 1962 from a well owned by Mr. Harry Fordyce near Ancona, Illinois in Livingston County. Location of well: 1220'S and 100'W of the NE corner of Section 33, T30N, R3E. Depth of well: 40 feet.

LABORATORY No. 157970

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.3		Chloride	Cl	160.	4.51
			Nitrate	NO_3	660.	10.63
			Alkalinity	(as $CaCO_3$)	188.	3.76
Turbidity	0		Hardness	(as $CaCO_3$)	1550.	31.00
Color	0					
Odor	0		Total Dissolved Minerals 2300			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Conley
Associate Chemist

LHC/ar

sp, NO_3

N. I. C. Co. (4 copies)

May 16, 1963

LIV30N3E-33.1g

PARTIAL CHEMICAL ANALYSIS

Sample No. 1A of water collected May 1, 1963 from a well owned by Mr. H. Fordyce near Ancona, Illinois in Livingston County. Location of well: 1200'S and 100'W of the NE corner of Section 33, T30N, R3E. Depth of well: 105 feet.

5

LABORATORY No. 160114

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	7.6		Chloride	Cl	37.	1.04
			Nitrate	NO_3	1.4	.02
			Alkalinity	(as $CaCO_3$)	336.	6.72
Turbidity	47		Hardness	(as $CaCO_3$)	466.	9.32
Color	0					
Odor	0					
			Total Dissolved Minerals		578	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sv

August 20, 1962

PARTIAL CHEMICAL ANALYSIS LIV30N3E-33.8h

Sample No. 2 of water collected June 13, 1962 from a well owned by Clark & Nelson near Amboy, Illinois in Livingston County. Location of well: 500'S and 250'W of the NW corner of Section 33, T30N, R3E. Depth of well: 65 feet.

S

LABORATORY No. 157979

	PPM.	EPM.			PPM.	EPM.
Iron(total) Fe	0.3		Chloride	Cl	112.	3.16
			Nitrate	NO_3	395.	6.36
			Alkalinity	(as $CaCO_3$)	300.	6.00
Turbidity	2		Hardness	(as $CaCO_3$)	940.	18.98
Color	0					
Odor	0		Total Dissolved Minerals 1267			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Henley
Associate Chemist

LHH/nr

sp, NO_3

February 21, 1963

12
LIV30N3E-34.15

PARTIAL CHEMICAL ANALYSIS

Sample No. 25 of water collected October 18, 1962 from a well owned by Mr. L. A. Sass near Ancona, Illinois in Livingston County. Location of well: 2200'S and 150'W of the NE corner of Section 34, T30N, R3E. Depth of well: 214 feet. Casing record: 4" Distance to water when not pumping: 12'

9

LABORATORY No. 158962

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.1		Chloride	Cl	13.	.37
			Nitrate	NO_3	3.6	.06
			Alkalinity	(as $CaCO_3$)	564.	11.28
Turbidity	2		Hardness	(as $CaCO_3$)	130.	2.60
Color	5					
Odor	0		Total Dissolved Minerals		634	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel N. Henley
Associate Chemist

LNH/sr

sp, NO_3

February 19, 1963

L1V30N3E-34.2h1

PARTIAL CHEMICAL ANALYSIS

Sample No. 23 of water collected October 18, 1962 from a well owned by Mr. Lewis A. Sass near Ancona, Illinois in Livingston County. Location of well: 100'S and 1200'W of the NE corner of Section 34, T30N, R3E. Depth of well: dug 24 feet. Date drilled: 1924. Size hole: 6' Casing record: 1 1/4 for 20'. Distance to water is 12'

D

LABORATORY No. 158960

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	1.5		Chloride	Cl	44.	1.24
			Nitrate	NO_3	1.6	.03
			Alkalinity	(as $CaCO_3$)	496.	9.92
Turbidity	7		Hardness	(as $CaCO_3$)	672.	13.44
Color	10					
Odor	0		Total Dissolved Minerals		757	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/ar

V27C976

sp, NO_3

February 21, 1963

LIV30N3E-34.2 h.2

PARTIAL CHEMICAL ANALYSIS

Sample No. 24 of water collected October 18, 1962 from a well owned by Mr. Lewis Sass near Ancona, Illinois in Livingston County. Location of well: 200'S and 1150'W of the NE corner of Section 34, T30N, R3E. Depth of well: 22 feet. Date drilled: 1920. Size hole: 4' Casing record: 1 1/4 Distance to water when not pumping 6'

D

LABORATORY No. 158961

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	2.2		Chloride	Cl	51.	1.44
			Nitrate	NO_3	2.2	.04
			Alkalinity	(as $CaCO_3$)	436.	8.72
Turbidity	9		Hardness	(as $CaCO_3$)	608.	12.16
Color	10					
Odor	0		Total Dissolved Minerals		686	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Henley
Associate Chemist

LHH/sr

V

sp, NO_3

February 21, 1963

LIV30N3E-34.8a1

PARTIAL CHEMICAL ANALYSIS

Sample No. 27 of water collected October 18, 1962 from a well owned by Mr. Dennis Carlton near Ancona, Illinois in Livingston County. Location of well: 200'E and 200'N of the SW corner of Section 34, T30N, R3E. Depth of well: 35 feet. Date drilled: 1900

D

LABORATORY No. 158963

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	14.		Chloride	Cl	43.	1.21
			Nitrate	NO_3	2.9	.05
			Alkalinity	(as $CaCO_3$)	216.	4.32
Turbidity	66		Hardness	(as $CaCO_3$)	542.	10.84
Color	10					
Odor	0		Total Dissolved Minerals		839	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

sp, NO_3

February 21, 1963

LIV30N3E-34.8a2

PARTIAL CHEMICAL ANALYSIS

Sample No. 27A of water collected October 19, 1962 from a well owned by Mr. Dennis Carlton near Ancona, Illinois in Livingston County. Location of well: 125'E and 200'N of the SW corner of Section 34, T30N, R3E. Depth of well: 45 feet. Date drilled: 1955. Casing record: 3"

S

LABORATORY No. 158964

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	2.6		Chloride	Cl	1.	.03
			Nitrate	NO_3	3.6	.06
			Alkalinity	(as $CaCO_3$)	460.	9.20
Turbidity	13		Hardness	(as $CaCO_3$)	420.	8.40
Color	5					
Odor	0		Total Dissolved Minerals		468	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/sr

V

B-78979

LAS 30N2E-10.3C1

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 59 of water collected September 23, 1963 from a well owned by Lenord Solayer near Ancona, Illinois in LaSalle County. Location of well: 3500'E and 1575'N of the SW corner of Section 10, T30N, R2E. Depth of well: 30 feet.

LABORATORY NO. 161431

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	24.		Chloride	Cl	79.	2.23
			Nitrate	NO_3	12.0	.19
			Alkalinity	(as $CaCO_3$)	344.	6.88
Turbidity	136		Hardness	(as $CaCO_3$)	680.	13.60
Color	0					
Odor	0		Total Dissolved Minerals 1062.			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel N. Henley
Associate Chemist

L H/rd

Water Well Data

LAS 30N2E-10.3C1

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 59A of water collected September 23, 1963 from a well owned by Lenard Selzyer near Ancona, Illinois in LaSalle County. Location of well: 3550'E and 1575'N of the SW corner of Section 10, T30N, R2E. Depth of well: 30 feet.

LABORATORY NO. 14,142

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	1.3		Chloride	Cl	52.	1.47
			Nitrate	NO_3	164.	2.63
			Alkalinity	(as $CaCO_3$)	272.	5.44
Turbidity	8		Hardness	(as $CaCO_3$)	627.	12.52
Color	0					
Odor	0		Total Dissolved Minerals		969.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Leonard J. Hooley
Associate Chemist

LJH/pd

November 26, 1963

PARTIAL CHEMICAL ANALYSIS LAS30NDE-10.8a

Sample No. 60 of water collected September 24, 1963 from a well owned by T. Healy near Ancona, Illinois in LaSalle County. Location of well: 100'E and 75'N of the SW corner of Section 10, T30N, R2E. Depth of well: 25 feet.

D

LABORATORY NO. 161483

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	3.6		Chloride	Cl	53.	1.49
			Nitrate	NO3	6.9	.11
			Alkalinity	(as CaCO3)	332.	6.64
Turbidity	5		Hardness	(as CaCO3)	648.	12.96
Color	0					
Odor	0		Total Dissolved Minerals		883.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Hanley
Associate Chemist

LMH/rd

Las 30N 2E-14.1g

August 21, 1962

PARTIAL CHEMICAL ANALYSIS

Sample No. 14 of water collected June 15, 1962 from a well owned by O. H. Scheuer near Ancona, Illinois in LaSalle County. Location of well: 260'W and 280'N of the SE corner of Section 14, T30N, R2E. Depth of well: 30 feet.
Date drilled: 1946. Size hole: 4" Casing Record: 1 1/4" Distance to water when nd pumping: 11'

LABORATORY No. 15799

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.6		Chloride	Cl	28.	.79
			Nitrate	NO_3	71.3	1.15
			Alkalinity	(as $CaCO_3$)	256.	5.12
Turbidity	2		Hardness	(as $CaCO_3$)	398.	7.96
Color	5					
Odor	0		Total Dissolved Minerals		572	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel A. Kenley
Associate Chemist

LAK/ar

LAS-30N2E-14. 4B
5a

August 21, 1962

PARTIAL CHEMICAL ANALYSIS

Sample No. 13 of water collected June 15, 1962 from a well owned by Dore Stucker near Ancona, Illinois in LaSalle County. Location of well: 350'W and 200'N of the SE corner of the SE 1/4 of the NW 1/4 of Section 14, T30N, R2E. Depth of well: 30 feet. Date drilled: 1895. Casing Record: 1 1/4" Distance to water when not pumping: 12'

LABORATORY No. 157990

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	1.0		Chloride	Cl	11.	.07
			Nitrate	NO_3	50.7	.95
			Alkalinity	(as $CaCO_3$)	284.	5.68
Turbidity	5		Hardness	(as $CaCO_3$)	580.	11.60
Color	5					
Odor	0		Total Dissolved Minerals		858	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Henley
Associate Chemist

LHH/sr

Las Bonze-15.1a

August 21, 1962

PARTIAL CHEMICAL ANALYSIS

Sample No. 16 of water collected June 16, 1962 from a well owned by Cecil Barr near Ancona, Illinois in LaSalle County. Location of well: 660'W and 150'N of the SE corner of Section 15, T30N, R2E. Depth of well: 190 feet.

Date drilled: 1958. Casing Record: 6" - 140'

LABORATORY No. 157995

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.8		Chloride	Cl	1725.	48.65
			Nitrate	NO_3	1.3	.02
			Alkalinity	(as $CaCO_3$)	1459.	29.60
Turbidity	5		Hardness	(as $CaCO_3$)	82.	1.64
Color	5					
Odor	D		Total Dissolved Minerals 4372			

ppm. = parts per million
epm. = equivalents per million
ppm. x .05 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel N. Henley
Associate Chemist

LNH/er

LAS 3N-2E-15.192

August 21, 1962

PARTIAL CHEMICAL ANALYSIS

Sample No. 20 of water collected June 16, 1962 from a well owned by Cecil Barr near Ransom, Illinois in LaSalle County. Location of well: 640'W and 100'N of the SE corner of Section 15, T33N, R2E. Depth of well: 25 feet.
Date drilled: 1925. Casing Record: 1 1/4"

LABORATORY No. 157997

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.2		Chloride	Cl	440.	12.41
			Nitrate	NO_3	235.	3.78
			Alkalinity	(as $CaCO_3$)	810.	16.20
Turbidity	5		Hardness	(as $CaCO_3$)	1440.	28.80
Color	5					
Odor	0		Total Dissolved Minerals 2983.			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel N. Donley
Associate Chemist

LND/er

LAS 38N 2E-15.2q

August 21, 1962

PARTIAL CHEMICAL ANALYSIS

Sample No. 19 of water collected June 16, 1962 from a well owned by Cecil Barr near Ancona, Illinois in LaSalle County. Location of well: 680'W and 150'N of the SE corner of Section 15, T30N, R2E. Depth of well: 30 feet.
Date drilled: 1910 Size hole: 6" Casing Record: 1 1/4"

LABORATORY No. 157996

	ppm.	epm.			ppm.	epm.
Iron (total) Fe	0.2		Chloride	Cl	120.	3.38
			Nitrate	NO_3	80.0	1.29
			Alkalinity	(as $CaCO_3$)	384.	7.68
Turbidity	2		Hardness	(as $CaCO_3$)	566.	11.32
Color	5					
Odor	0		Total Dissolved Minerals		900	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Henley
Associate Chemist

LHH/mr

LAS 30N 2E - 15.9h

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 58 of water collected September 23, 1963 from a well owned by Lenord Selmyer near Ransom, Illinois in LaSalle County. Location of well: 1300'S and 50'W of the NW corner of Section 15, T30N, R2E. Depth of well: 30 feet.

LABORATORY NO. 161450

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.2		Chlorids	Cl	2.	.06
			Nitrate	NO_3	1.0	.02
			Alkalinity	(as $CaCO_3$)	341.	6.96
Turbidity	7		Hardness	(as $CaCO_3$)	200.	5.00
Color	0					
Odor	0		Total Dissolved Minerals		454.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Tenley
Associate Chemist

LHT/md

LAS 3ONZE-23,24

August 21, 1962

PARTIAL CHEMICAL ANALYSIS

Sample No. 21 of water collected June 15, 1962 from a well owned by Sullivan near Ancona, Illinois in LaSalle County. Location of well: 100'N and 200'S of the NE corner of the NW 1/4 of the SE 1/4 of Section 23, T36N, R2E. Depth of well: 30 feet. Date drilled: 1940. Size hole: 3"

LABORATORY No. 157998

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.5		Chloride	Cl	140.	3.92
			Nitrate	NO_3	122.	1.96
			Alkalinity	(as $CaCO_3$)	236.	4.72
Turbidity	3		Hardness	(as $CaCO_3$)	724.	14.48
Color	5					
Odor	0		Total Dissolved Minerals 1036			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Tenley
Associate Chemist

LHT/cr

LAS 3eN 2E- 23, 2 h 12

6

August 21, 1962

PARTIAL CHEMICAL ANALYSIS

Sample No. 22 of water collected June 14, 1962 from a well owned by Sullivan near Ancona, Illinois in LaSalle County. Location of well: 200'E and 200'S of the NE corner of the NW 1/4 of the NE 1/4 of Section 23, T30N, R2E. Depth of well: 161 feet. Date drilled: 1937. Casing Record: 4"-175'

LABORATORY No. 157999

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	4.7		Chloride	Cl	30.	.84
			Nitrate	NO_3	95.2	1.53
			Alkalinity	(as $CaCO_3$)	196.	3.92
Turbidity	20		Hardness	(as $CaCO_3$)	624.	12.48
Color	5					
Odor	0		Total Dissolved Minerals		923	

ppm. = parts per million
epm. = equivalents per million
ppm. ÷ .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel D. Kenlay
Associate Chemist

LDK/ax

LAS 30N-2E-23.8c

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 57 of water collected from a well owned by Lewis Colehower near Ancona, Illinois in LaSalle County. Location of well: 250'S and 75'E of the NW corner of the NW 1/4 of the SW 1/4 of Section 23, T32N, R2E. Depth of well: 25 feet.

LABORATORY NO. 151479

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	4.0		Chloride	Cl	5.	.14
			Nitrate	NO3	1.3	.02
			Alkalinity	(as CaCO3)	360.	7.36
Turbidity	10		Hardness	(as CaCO3)	352.	7.04
Color	0					
Odor	0		Total Dissolved Minerals		540.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel N. Benley
Associate Chemist

LNB/rd

LAS 30N2E-23,8h

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 54 of water collected from a well owned by Louise Love near Ancona, Illinois in LaSalle County. Location of well: 100'E and 120'S of the NW corner of Section 23, T30N, R2E. Depth of well: 25 feet.

LABORATORY NO. 161474

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.7		Chloride	Cl	32.	.90
			Nitrate	NO_3	13.6	.22
			Alkalinity	(as $CaCO_3$)	324.	6.48
Turbidity	5		Hardness	(as $CaCO_3$)	424.	8.48
Color	0					
Odor	0		Total Dissolved Minerals		625.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel R. Henley
Associate Chemist

LRH/rd

LAS 30N2E-24.1b

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 51 of water collected September 14, 1963 from a well owned by Perry Ritchie near Ancona, Illinois in LaSalle County. Location of well: 750'N and 100'W of the SE corner of Section 24, T30N, R2E. Depth of well: 32 feet.

LABORATORY NO. 16414/70

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	1.7		Chloride	Cl	37.	1.04
			Nitrate	NO3	1.0	.03
			Alkalinity	(as CaCO3)	424.	8.48
Turbidity	11		Hardness	(as CaCO3)	740.	14.80
Color	0					
Odor	0		Total Dissolved Minerals 1167.			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Hanley
Associate Chemist

LMH/rd

November 26, 1963

LASSONDE-94.16

PARTIAL CHEMICAL ANALYSIS

Sample No. 51A of water collected September 12, 1963 from a well owned by Perry Ritchie near Ancona, Illinois in LaSalle County. Location of well: 700'N and 200'W of the SE corner of Section 24, T30N, R2E. Depth of well: 92 feet.

S-6

LABORATORY No. 161471

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	3.6		Chloride	Cl	48.	1.35
			Nitrate	NO_3	13.8	.22
			Alkalinity	(as $CaCO_3$)	536.	10.72
Turbidity	15		Hardness	(as $CaCO_3$)	867.	17.34
Color	60					
Odor	0		Total Dissolved Minerals 1190.			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Hanley
Associate Chemist

LHH/rd

Sp, NO_3
LAS 30N2E - 24.4a1

February 21, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 40 of water collected from a well owned by Mr. A. P. Hase near Ancona, Illinois in LaSalle County. Location of well: 2600'W and 150'N of the SE corner of Section 24, T30N, R2E. Depth of well: 25 feet.
Date drilled: approx 1900

LABORATORY No. 159096

	ppm.	epm.			ppm.	epm.
Iron (total) Fe	0.1		Chloride	Cl	55.	1.55
			Nitrate	NO_3	112.0	1.80
			Alkalinity	(as $CaCO_3$)	228.	4.56
Turbidity	5		Hardness	(as $CaCO_3$)	684.	13.68
Color	0					
Odor	0		Total Dissolved Minerals 1098			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel A. Hanley
Associate Chemist

LAH/er

sp, NO_3

LAS 30N 2E - 24.4cc 2

February 27, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 40A of water collected from a well owned by A. F. Sass near Ancona, Illinois in LaSalle County. Location of well: 2500'W and 150'N of the SE corner of Section 24, T30N, R2E. Depth of well: 103 feet.
Date drilled: 1903

LABORATORY No. 159097

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.2		Chloride	Cl	100.	2.82
			Nitrate	NO_3	1.6	.03
			Alkalinity	(as $CaCO_3$)	828.	16.56
Turbidity	4		Hardness	(as $CaCO_3$)	192.	3.84
Color	0					
Odor	0		Total Dissolved Minerals		1182	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Henley
Associate Chemist

LMH/ar

LaS 30N2E-25.19

August 21, 1962

PARTIAL CHEMICAL ANALYSIS

Sample No. 10 of water collected June 12, 1962 from a well owned by Ronald Kenny near Ancona, Illinois in LaSalle County. Location of well: 1300'S and 250'W of the NE corner of Section 25, T30N, R2E. Depth of well: 45 feet. Date drilled: 1905. Elev. above sea level top of well: 640. Casing Record: 1 1/4"

LABORATORY No. 157987

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	6.4		Chloride	Cl	11.	.31
			Nitrate	NO_3	19.7	.32
			Alkalinity	(as $CaCO_3$)	312.	6.24
Turbidity	32		Hardness	(as $CaCO_3$)	760.	15.20
Color	5					
Odor	0		Total Dissolved Minerals 1321			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0563 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Henley
Associate Chemist

LHH:mr

sp, NO_3
LAS 30N2E-21.29

February 27, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 41 of water collected from a well owned by Fenton Brennan near Ancona, Illinois in LaSalle County. Location of well: 1200'W and 150'N of the SE corner of Section 25, T30N, R2E. Depth of well: 110 feet.
Date drilled: approx 1900

LABORATORY No. 159098

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	Tr.		Chloride	Cl	9.	.25
			Nitrate	NO_3	5.1	.08
			Alkalinity	(as $CaCO_3$)	368.	7.36
Turbidity	3		Hardness	(as $CaCO_3$)	272.	5.44
Color	0					
Odor	0		Total Dissolved Minerals		526	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel N. Henley
Associate Chemist

LNH/sr

LAS 30N2E-25.6a

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 528 of water collected September 12, 1963 from a well owned by E. Shay near Ansonn, Illinois in LaSalle County. Location of well: 1330'E and 30'N of the SW corner of Section 25, T30N, R2E. Depth of well: 120 feet.

LABORATORY NO. 161472

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.3		Chloride	Cl	14.	.39
			Nitrate	NO_3	6.6	.11
			Alkalinity	(as $CaCO_3$)	332.	6.64
Turbidity	7		Hardness	(as $CaCO_3$)	252.	5.04
Color	0					
Odor	0		Total Dissolved Minerals		386.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel R. Hanley
Associate Chemist

LRH/rd

LAS BONZE-25.8h.1

6

August 21, 1962

PARTIAL CHEMICAL ANALYSIS

Sample No. 11 of water collected June 15, 1962 from a well owned by Flahaven near Ancona, Illinois in LaSalle County. Location of well: 225'N and 400'E of the NW corner of Section 25, T30N, R2E. Depth of well: 112 feet.
Date drilled: 1955. Casing Record: 8"

LABORATORY No. 157980

	ppm.	epm.			ppm.	epm.
Iron (total) Fe	4.6		Chloride	Cl	100.	2.82
			Nitrate	NO_3	2.3	.05
			Alkalinity	(as $CaCO_3$)	412.	10.28
Turbidity	27		Hardness	(as $CaCO_3$)	170.	3.40
Color	5					
Odor	0		Total Dissolved Minerals (TDS)			

ppm. = parts per million
epm. = equivalents per million
ppm. ÷ 17.1 = grains per gallon

STATE WATER SURVEY DIVISION

Laural H. Bonley
Associate Chemist

LHB/ar

LAS30N2E-25.8h

May 17, 1965

S-6

PARTIAL CHEMICAL ANALYSIS

Sample of water collected May 4, 1965 from a well owned by Donald J. Flahaven near Wenona, Illinois in LaSalle County. Location of well: 200'E and 400'S of the NW corner of Section 25, T30N, R2E. Depth of well: 112 feet.

LABORATORY NO. 165863

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	3.4		Fluoride	F	1.4	
			Chloride	Cl	92.	2.59
			Sulfate	SO_4	156.9	3.27
			Alkalinity	(as $CaCO_3$)	912.	18.24
Turbidity	9		Hardness	(as $CaCO_3$)	192.	3.84
Color	15					
Odor	0		Total Dissolved Minerals 1335.			

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

ILLINOIS STATE WATER SURVEY

Laurel M. Henley
Associate Chemist

LMH/rd

Collected 5-4-65

25.8h

LA SALLE 25-30N-2E
Sp F
165863
CH_4

ILLINOIS STATE GEOLOGICAL SURVEY
Urbana, Illinois

REPORT OF GAS FLOW MEASUREMENT
September 11, 1964

FARM - Donald J. Flahaven, Wenona, Ill.

LOCATION - 200' E, 400' S, of NW corner 25-30N-2E, LaSalle County

ELEVATION - 660' topographical map

DATE DRILLED - About 1954

DRILLER - Guy Deffenbaugh

TOTAL DEPTH - 112', probably in Penn. Formation

CASING - 8" at 40'

TYPE OF PUMP - Deep cylinder (monitor) set at 80', 40-gallon water system tank

BAROMETER READING - 29.50"

GAS VOLUME - In 1/2 min. = 1/2" of gas in 1' diameter test tank under 3 PSI with about 6 gallons of water per min. passing thru.
In 1 min. = 6" of gas
In 1 1/2 min. = 9 1/2" of gas
In 16 min. = very little water mostly gas

NOTE: One inch of gas in test tank is 108 cubic inches or a little less than 1/2 gallon water displacement. Larry English of Northern Illinois Gas Company assisted in above test.

By Wayne F. Meents
Associate Geological Engineer

Las 30N-2E-25.8h2

August 21, 1962

PARTIAL CHEMICAL ANALYSIS

Sample No. 12 of water collected June 15, 1962 from a well owned by Plainview near Aroma, Illinois in LaSalle County. Location of well: 175'E and 400'S of the NW corner of Section 25, T30N, R2E. Depth of well: 35 feet. Date drilled: 1915 Size hole: 4" Casing Record: 1 1/4" Distance to water when not pumping: 12'

LABORATORY No. 157909

	PPM.	EPM.			PPM.	EPM.
Iron(total) Fe	1.1		Chloride	Cl	20.	.56
			Nitrate	NO_3	43.7	.70
			Alkalinity	(as $CaCO_3$)	300.	6.00
Turbidity	3		Hardness	(as $CaCO_3$)	370.	7.40
Color	5					
Odor	0		Total Dissolved Minerals		525	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel H. Manley
Associate Chemist

LHM/ap

LAS 30N2E-26.1a

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 56 of water collected from a well owned by E. Shay near Ancona, Illinois in LaSalle County.
Location of well: 150'N and 75'W of the SE corner of Section 26, T30N, R2E. Depth of well: 30 feet.

LABORATORY NO. 1:1478

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	3.3		Chloride	Cl	6.	.17
			Nitrate	NO_3	4.8	.08
			Alkalinity	(as $CaCO_3$)	236.	4.72
Turbidity	11		Hardness	(as $CaCO_3$)	1460.	29.20
Color	0					
Odor	0		Total Dissolved Minerals		2284.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

ILLINOIS WATER SURVEY DIVISION

Laurel H. Henley
Associate Chemist

LHH/rd

LAS 30N2E-36.1f

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 558 of water collected September 23, 1963 from a well owned by Ray Carretson near Ancona, Illinois in LaSalle County. Location of well: 1400'S and 100'W of the NE corner of Section 36, T30N, R2E. Depth of well: 30 feet.

LABORATORY NO. 161477

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	6.1		Chloride	Cl	37.	1.04
			Nitrate	NO_3	11.0	.18
			Alkalinity	(as $CaCO_3$)	396.	7.92
Turbidity	20		Hardness	(as $CaCO_3$)	500.	10.00
Color	35					
Odor	0		Total Dissolved Minerals		625.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel L. Nenley
Associate Chemist

LLN/rd

Sp No3
~~161477~~
161477

36.1P

N. I. GAS CO. WATER SAMPLE PLAN

WELL NO. 55 B PROPERTY OWNER R. Gunnerson

ADDRESS RR #3 Pontiac

DATE 9-23-63 TENANT Richard Lutz RR. Dana

SEC. 36

TWP. 30 N

RGE. 2 E

DESCRIPTION OF LOCATION 1400' S & 100' W of NE/cor of Section 36

TYPE OF WELL: DRILLED ____ DUG ✓ TILE ____ OTHER ____

YEAR WELL MADE: ____

WELL DEPTH 30 FEET

CASING SIZE ____ INCHES

CASING DEPTH ____ FEET

FORMATION COMPLETION: DRIFT ____ LIMESTONE ____ SANDSTONE ____

WELL: %L.E.L. 0 % GAS 0

SAMPLES: %L.E.L. 0 % GAS 0

SEDIMENTS: YES ____ NO ____

BACTERIA ANALYSIS ATTACHED: YES ____ NO ____

CHEMICAL ANALYSIS ATTACHED: YES ✓ NO ____

OCCUPANTS SIGNATURE ____

REP. COLLECTOR English

not in database

November 26, 1963

PARTIAL CHEMICAL ANALYSIS LASSONDE-36.1g

Sample No. 55A of water collected from a well owned by Ray Garretson near Ancona, Illinois in LaSalle County. Location of well: 1300'S and 75'W of the NE corner of Section 36, T30N, R2E. Depth of well: Approx. 120 to 125 feet.

S-6

LABORATORY NO. 161476

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	2.6		Chloride	Cl	560.	15.79
			Nitrate	NO_3	0.6	.01
			Alkalinity	(as $CaCO_3$)	1980.	39.60
Turbidity	6		Hardness	(as $CaCO_3$)	48.	.96
Color	0					
Odor	0		Total Dissolved Minerals		3015.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel M. Honley
Associate Chemist

LMH/rd

Sample No. 554

Sp no 3
161476

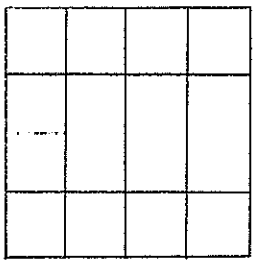
36.19

N. I. GAS CO. WATER SAMPLE PLAN

WELL NO. 554 PROPERTY OWNER Jay Gardner Son

ADDRESS RR # 3 Pontiac

DATE _____ TENANT Richard Lutz RR Dana



SEC. 36

TWP. 30N

RGE. 2E

DESCRIPTION OF LOCATION 1200's of 35 E

NE/ cor. of Sec 36

Ford County

TYPE OF WELL: DRILLED ✓ DUG _____ TILE _____ OTHER _____

YEAR WELL MADE: 1925

WELL DEPTH Approx 120 To 125 F. FEET

CASING SIZE _____ INCHES

CASING DEPTH _____ FEET

FORMATION COMPLETION: DRIFT _____ LIMESTONE _____ SANDSTONE _____

WELL: %L.E.L. 1% % GAS 20

SAMPLES: %L.E.L. 1% % GAS 40

SEDIMENTS: YES _____ NO _____

BACTERIA ANALYSIS ATTACHED: YES _____ NO _____

CHEMICAL ANALYSIS ATTACHED: YES ✓ NO _____

OCCUPANTS SIGNATURE _____

REP. COLLECTOR English

LAS 30N2E-36.19

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 55 of water collected September 23, 1963 from a well owned by Ray Garretson near Ancona, Illinois in LaSalle County. Location of well: 1200'S and 75'W of the NE corner of Section 36, T30N, R2E. Depth of well: 30 feet.

LABORATORY NO. 161475

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	3.3		Chloride	Cl	9.	.25
			Nitrate	NO_3	10.7	.17
			Alkalinity	(as $CaCO_3$)	356.	7.12
Turbidity	14		Hardness	(as $CaCO_3$)	388.	7.76
Color	0					
Odor	0		Total Dissolved Minerals		520.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel N. Henley
Associate Chemist

LNH/rd

Sp No 3
1/6 1975

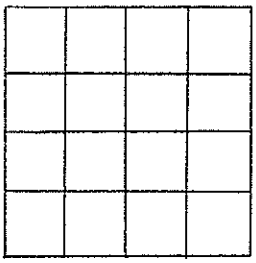
36.19

N. I. GAS CO. WATER SAMPLE PLAN

WELL NO. 55 PROPERTY OWNER Ray Carrotson

ADDRESS RR 3 Pontiac

DATE 9-23-63 TENANT Richard Lutz RR Dana



SEC. 36

TWP. 29N

RGE. 3E

DESCRIPTION OF LOCATION 1200' S & 75' W NE Cor. of Section 36

TYPE OF WELL: DRILLED ____ DUG ✓ TILE ____ OTHER ____

YEAR WELL MADE: ____

WELL DEPTH 30 FEET

CASING SIZE ____ INCHES

CASING DEPTH ____ FEET

FORMATION COMPLETION: DRIFT ____ LIMESTONE ____ SANDSTONE ____

WELL: %L.E.L. 0 % GAS 0

SAMPLES: %L.E.L. 0 % GAS 0

SEDIMENTS: YES ____ NO ____

BACTERIA ANALYSIS ATTACHED: YES ____ NO ____

CHEMICAL ANALYSIS ATTACHED: YES ____ NO ____

OCCUPANTS SIGNATURE ____

REP. COLLECTOR English

LAS 30N2E-36.6h

November 20, 1963

PARTIAL CHEMICAL ANALYSIS

Sample No. 53 of water collected September 23, 1963 from a well owned by Mrs. Lula Andree near Ancona, Illinois in LaSalle County. Location of well: 1330'E and 100'S of the NW corner of Section 36, T30N, R2E. Depth of well: 120 feet.

LABORATORY NO. 161473

	ppm.	epm.			ppm.	epm.
Iron(total) Fe	0.6		Chloride	Cl	140.	3.95
			Nitrate	NO_3	1.8	.03
			Alkalinity	(as $CaCO_3$)	632.	12.64
Turbidity	5		Hardness	(as $CaCO_3$)	76.	1.52
Color	0					
Odor	0		Total Dissolved Minerals		963.	

ppm. = parts per million
epm. = equivalents per million
ppm. x .0583 = grains per gallon

STATE WATER SURVEY DIVISION

Laurel T. Henley
Associate Chemist

LTH/rd

Sp No3
161473

N. I. GAS CO. WATER SAMPLE PLAN 36.6h

WELL NO. 53 PROPERTY OWNER Mrs. Lula Andrez

ADDRESS 208 Roy St. Streator

DATE 9-23-63 TENANT

SEC. 36 DESCRIPTION OF LOCATION 1330'E & 100'S

TWP. 31N NW/cor of Section 36.

RGE. 2E

TYPE OF WELL: DRILLED ✓ DUG ____ TILE ____ OTHER ____

YEAR WELL MADE: 1949

WELL DEPTH 120 FEET

CASING SIZE 5" INCHES

CASING DEPTH ____ FEET

FORMATION COMPLETION: DRIFT ____ LIMESTONE ____ SANDSTONE ____

WELL: %L.E.L. 0 % GAS 0

SAMPLES: %L.E.L. 130 % GAS 4

SEDIMENTS: YES ____ NO ____

BACTERIA ANALYSIS ATTACHED: YES ____ NO ____

CHEMICAL ANALYSIS ATTACHED: YES ✓ NO ____

OCCUPANTS SIGNATURE ____

REP. COLLECTOR English