GARDEN ENGINEERING SERVICE
PHONE 672-2526 P.O. BOX 451
OSKALOOSA, IOWA 52577
CONSULTING ENGINEERS

MAY 31, 1972

MERRILL L. GARDEN, P.E. (1910-1969)
JOHN W. HESLING, P.E.
JOHN W. N. STEDDOM, P.E.

DEPARTMENT OF HEALTH
LUCAS STATE OFFICE BUILDING
DES MOINES, IOWA

IOWA GEOLOGICAL SURVEY
GEOLOGICAL SURVEY BUILDING
IOWA CITY, IOWA 50240

FARMERS HOME ADMINISTRATION
210 WALNUT
873 FEDERAL BUILDING
DES MOINES, IOWA

RE: BUSSEY, IOWA WATER

GENTLEMEN:

PLEASE FIND ENCLOSED RATE OF FLOW VS. DRAWDOWN CHART FOR THE BUSSEY, IOWA JORDAN WELL. THE BUSSEY WELL IS 2265 FEET DEEP AND IS CASED WITH 10 3/4" O.D. CASING FROM THE SURFACE DOWN 568.5 FEET; THEN WITH 1245 FEET OF 7" O.D. CASING; THEN 451.5 FEET OF 6" OPEN HOLE. THE ENCLOSED SHEET SHOWS CURVE # 1 - RATE OF FLOW VS. DRAWDOWN; CURVE # 2 - FRICTION LOSS IN CASING AND OPEN HOLE AND CURVE # 3 - NET SPECIFIC YIELD (CURVE # 1 MINUS CURVE # 2) = 20 gpm/FT. D.D. THE NET SPECIFIC YIELD FOR THIS WELL UP THROUGH 600 GPM IS 20 ~~GALLONS~~ gpm PER FOOT OF DRAWDOWN AFTER ACIDIZING WITH 4000 GALLONS OF 20° BAUME MURIATIC ACID. THE SPECIFIC YIELD PRIOR TO ACIDIZING WAS 1.5 GPM PER FOOT OF DRAWDOWN AT 300 GPM.

568.5
1245
451.5
2265.0
1245
568.5
1813.5

PRELIMINARY FIELD TESTS INDICATE THAT THE HARDNESS WILL BE APPROXIMATELY 20 GRAINS. OTHER TESTS WERE NOT TAKEN BECAUSE pH AT THE END OF THE TEST PUMPING WAS STILL HOVERING AROUND 7.0, WHICH INDICATES ALL OF THE ACID WAS NOT FLUSHED OUT OF THE HOLE. A SAMPLE WILL BE SUBMITTED FOR COMPLETE MINERAL ANALYSIS AFTER THE WATER HAS BEEN PUMPED FOR SEVERAL DAYS TO RETURN pH TO NORMAL.

PLEASE ADVISE IF ANY FURTHER INFORMATION IS DESIRED ON THIS WELL.

YOURS TRULY,

GARDEN ENGINEERING SERVICE

JOHN W. HESLING, P. E.

MB
ENCLOSURE

GW Marion Co. Gen Files

1

March 2, 1966

Mr. Merrill L. Garden
Garden Engineering Service
P.O. Box 451
Oskaloosa, Iowa

Dear Mr. Garden:

The Bussey, Iowa forecast which you requested last week is enclosed. The conditions appear favorable for developing a successful well in the Jordan Sandstone as in a number of other communities in this general area. The well would be very expensive, but the expense might be justified taking into account the present situation at Bussey and the large yield and good quality water that should be obtained from the Jordan aquifer.

We hope this report fully answers your questions. If we can be of additional assistance in any way, please let us know.

Very truly yours,

H. G. Hershey

HGH/PJH/1

Enclosure

Ground-Water Conditions at Bussey, 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 Bussey(1960 population 557) is located near the southeastern corner of Marion County mostly in the SW¼ sec. 13, but including the N½ NW¼ sec. 24, T. 74N., R. 18W. (Liberty Township). The town is about midway between Knoxville and Albia and is serviced by Highway 156 and County Road B leading to Highway 60. The Wabash and C.B.& Q. Railway Companies also have a line through Bussey. Based on a starting elevation of 875 feet above sea level at the site of the old town test well No. 1(1936) in the NE¼ SW¼ SW¼ sec. 13, a generalized log of the strata anticipated beneath this site down through the St. Lawrence Dolomite is summarized as follows:

Formation	Thickness(ft.)	Depth Range(ft.)
Quaternary System		
Pleistocene Series(top soil and glacial drift)	70	0-70
Pennsylvanian System		
Des Moines Series(mostly shale, includes thin sandstone and minor coal seams)	150	70-220
Mississippian System		
Ste. Genevieve Formation(limestone, some shale in lower part)	40	220-260
St. Louis Formation(dolomite and sandstone in upper part, gypsum and limestone in lower part)	70	260-330
Warsaw Formation(shale and dolomite in variable percentages)	10	330-340
Keokuk-Burlington Formations (limestone and dolomite with much chert)	185	340-525
Hampton Formation(dolomite with considerable chert)	65	525-590
North Hill Limestone	65	590-655
Prospect Hill Siltstone	5	655-660
Maple Mill Shale	75	660-735
Devonian System		
Lime Creek Formation(limestone, probably some shale)	115	735-850
Cedar Valley Formation(limestone in upper part, dolomite below, usually contains some gypsum)	260	850-1110

Formation	Thickness(ft.)	Depth Range(ft.)
Wapsipinicon Formation(limestone and gypsum in variable percentages, but perhaps 50/50)	95	1100-1205
Ordovician System		
Maquoketa Formation(shale at top, dolomite with chert in lower part)	190	1205-1395
Galena Formation(dolomite with minor chert)	180	1395-1575
Decorah-Platteville Formations (dolomite and limestone with minor shale)	75	1575-1650
St. Peter Sandstone	30	1650-1680
Prairie du Chien Formation		
Willow River Member(dolomite, sandy, some chert)	165	1680-1845
RooteValley Member(sandstone and dolomite, percentages variable)	100	1845-1945
Oneota Member(dolomite with considerable chert)	205	1945-2150
Cambrian System		
Jordan Sandstone, dolomitic	50	2150±-2200
St. Lawrence Dolomite	100±	2200-2300±

The actual formation depths encountered in a well at this site may be somewhat different than our estimates indicate owing to local variations in the structure and thickness of the beds.

The existing water supply at Bussey is obtained from two wells completed in the sandy limestone in the upper part of the St. Louis Formation at depths of 260 and 285 feet. The production probably is not large and the water seems to be highly mineralized in sulfate and extremely hard. This condition is attributed to the presence of gypsum in the lower St. Louis beds from which water is drawn up into the wells.

Although several water-yielding zones probably will occur in the underlying rocks for many hundreds of feet below, the next promising source for large supplies of potable water seems to be the lower Prarie du Chien-Jordan-St. Lawrence sequence at a depth range of about 2,050 to 2,250 feet. Similar conditions are found at Sully, Albia, and Russell, and at other communities in the surrounding area. At these wells the upper and intermediate strata yielded insufficient quantities of water of such poor quality that drilling was continued to the Jordan Sandstone aquifer. A minimum of several hundred gallons a minute generally can obtained from this source. Specific capacities range between 4 and 10 gallons a minute per foot of drawdown while pumping. For example, the Albia well reportedly produced 425 gpm with about 40

feet of drawdown from an original static head of 274 feet. The static head of the Jordan aquifer at Bussey is expected to be about 675 feet above sea level or about 200 feet below the surface. In a well of this type it is advisable to set casing from the surface into the upper 50-100 feet of the Prarie du Chien Dolomite and grout the pipe in place with neat cement for its full length. This will prevent the highly mineralized waters in the upper and intermediate zones from contaminating the water from the Jordan. It will also prolong the life of the well by protecting the pipe from corrosion. The mineral quality of the water from the Sully, Albia, and Russell wells is shown on a separate sheet appended to this report.

From the foregoing we conclude that the water from the upper and intermediate formations at Bussey probably will be very highly mineralized as in the existing town wells. The Jordan Sandstone and associated dolomite strata at a depth range of about 2,050 to 2,250 feet seem to be the most promising source for large supplies of good quality water for municipal use based on results at other deep wells in this part of Iowa. There are always some uncertainties in drilling a well as deep as the Jordan Sandstone so we cannot be positive about the results; but to repeat, the outlook is definitely promising

PJH 3/66

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
Bussey Town No. 1 (1936)	4/22/64	260±	St. Louis	50	3748	7.4	.12	468	63	16	525	0	276	2220	29	1.3	1.4	1380	226	1154	7.4	4340
Bussey town No. 2 (1960)	1/7/62	285	"		3657	1.1	<.05	436	69	13	532	0	283	2210	30	1.1	0.1	1372	232	1140	7.2	4150
Sully town (1964)	1/18/65	2241	Jordan	70±	873	1.7	<.05	82	38	21	140	0	357	360	23	1.3	<0.1	360	293	67	7.5	1310
Albia town (1956)	1/4/57	2295	"	74	1160	3.5	.14	103	42	22	220	0	310	338	222	1.8	<0.1	431	254	177	7.1	1730
Russell town (1957)	4/2/62	2519	"		873	1.8	.20	60	25	18	196	0	327	303	102	3.4	<0.1	254	254	0	7.5	1390

NOTES: < = Less than

Jack

12-16-71

Town of Bussey

Save for Bussey file

Call from Ed Winslow, 10:30 AM.
Current depth 1615'
Drill time: 15-20'/hr.

Drilling Dates:
Nov. 22, 1971 to

12-19-71
Current depth 1798'
Ed estimates they are about 70' into P. du Ch.

Cuttings will be brought in 12-20-71;
will only have samples from 1600 feet
so can only provide check on
Decorah-Platteville, St. Peter & P. du Ch.

Addendum 1-4-72

Ed Winslow called at 8:45 AM
will bring samples in at 2:00 PM
Currently at 2207; penetration rate variable, 8' to 3'/hr.
Paul's forecast indicated Jordan at 2150

1723
430
2153 est. Jordan
60
2213 est. St. Lawr.

12-20-71

Ed Winslow brought in samples this morning for confirmation of St. Peter top. Samples from 1600 – 1795.

1685-1690 – trace Glenwood Sh.
1690 – 1704 – same a.a.
1704 circulation – some St. Peter type sd.
1704 – ~1725 – some trace of st Peter sd.
1725 – 1730 – poor samples, but trace of sdy dol

From drilling time it appears that the Glenwood Shale was reached @ 1688 (1681) ft. The GRN log of the Knoxville well indicates 10 ft. of Glenwood which is probably about the max we could expect here. this would put the St Peter at about 1698 ft. Drilling time indicates a slight break at 1699 ft. which I believe is probably the St Peter top. Top of the P. du Ch. from drilling time is probably @ 1724 ft. I can't pick up a good top in the samples, but my guess would be the 1725-30 interval.

St Peter – 1699 (1687) ft. } 25 ft thick
P du. Ch. – 1724 (1723) ft. }
1798 present depth } 71 ft.

Jack Gilmore.

GW Bussey town well (1971)
Marion Co.

December 21, 1971

Mr. L.F. Winslow
Winslow Well Drilling Co.
Route 1
Walcott, Iowa 52772

Dear Mr. Winslow:

I have examined the drill cuttings from the Bussey town well for the St. Peter-Prairie du Chien interval and believe the geologic section to be as follows:

Top St. Peter---1699 ft.
Top P. du Ch.---1724 ft.

The drilling time log shows a marked drop at 1688 ft. This is probably the Glenwood Shale as the cuttings show a fair amount of shale below 1685 ft. The first good St. Peter sandstone occurs in 1704 ft. circulation sample. I would expect the St. Peter comes in somewhat higher than this as the Glenwood Shale is generally less than 10 ft. thick in this area. I called the Prairie du Chien promarily on the bases of drilling time as the cuttings are somewhat difficult to interpret through this interval due to much recirculation. The well is presently 1798 ft. deep which in my opinion would put 71 ft. into the Prairie du Chien.

Very truly yours,

Jack L. Gilmore
Research Geologist

JLG:gh

GW Bussey Deepwell (1972)

STATE OF IOWA
IOWA GEOLOGICAL SURVEY
16 WEST JEFFERSON STREET
IOWA CITY, IOWA 52240
Phone: (319) 338-1173

Samuel J. Tuthill
Director and State Geologist

Orville J Van Eck
Assistant State Geologist

June 1, 1972

Mr. John W. Hesling
Garden Engineering Service
P.O. Box 451
Oskaloosa, Iowa 52577

Dear Mr. Hesling,

Thank you for the information you sent us on the Bussey municipal well. Apparently the acidizing job was quite successful. In reviewing our data I find we do not have anything on the original static water level and the static head after acidizing. Also, what was the duration of the pumping test at various rates? If you can supply these additional data I would appreciate having them.

Very truly yours,

Paul J. Horick
Chief of Groundwater Geology

PJH:gh

Bussey

2150-55 v. few gtz grains
55-60 " " "
2164 60-65 " "
65-70 } v. little oxmoore - Ss, graphite
70-75 }
75-80 Jordan - much sec. overgrowth
80-85 " "
2185-90 Jordan

2165
60
2225

2205-10 Mixed Jordan & St. Lau
2210-15 - Mixed Jordan - St. Lau
2215-20 v. little s.l

1-4-72
3:30 PM
Fred brought samples in.

Top Jordan 2164

Top St. Lau 2204 2204
2169
40

COMPANY Ed Winslow FARM WELL NO.

SEC. TWP. RGE. LOC. COUNTY STATE

CONTRACTOR SIZE HOLE DRILL PIPE

REMARKS: SIZE PUMP LINERS LENGTH STROKE

DATE 35 358 Dec 18 1971 Bussey #1

DEPTH	TIME O'CLOCK	MIN.	REMARKS
1605 / 1610	700 / 712	12	
1610 / 1615	724 / 737	13	CONN TONG CABLE BROKE
1620	754	23	34 FO. 6
1625	24	30	5 per rig
30	9:02	38	
35	43	43	
40	10:30	45	cir 10 MIN jet git.
1645 / 45	12:15		CONN
			MIX 90
1641	12:15 / 19	4	
42	27	8	
43	36	9	
44	42	6	
45	45	3	
46	53	8	
47	59	6	
48	1:05	6	
49	10	5	
50	16	6	
51	23	7	
52	1,35	12	cir S.H.T.
53	140	5	
54	325	15	340
55	350	10	
56	4:02	12	
57	15	13	
58	27	12	
59	440	13	pump
60	5" / 62	30	
61	530	10	
62	43	13	13
63	55	12	
64	609	14	
65	20	11	
66	630	10	
67	640	10	
68	647	7	
69	659	12	
70	710	11	
71	719		Kelly 2' short
72			CONN
73	735 /		
74	743	8	
1675	755	12	
76	9:05	10	flow check
77	824 / 39	13	
78	853	14	
79	905	12	
80	918	13	

DEPTH	TIME O'CLOCK	MIN.	REMARKS
1680 / 81	918 / 930	12	
82	9:37	7	Glenwood
83	9:45	8	
84	51	6	
85	57	6	
86	10:04	9	
87	10:16	10	
88	10:17	1	St Peter
89	10:18	1	6 1/2 3
1690	10:19	1	1723
91	10:20	1	1687
92	10:21	1	36
93	10:21 1/2	1/2	
94	10:22	1/2	
95	10:22 1/2	1/2	
96	10:24	1	
97	10:25	1	
98	10:26	1	
99	10:26 1/2	1/2	
1700	10:27	1/2	
1701	10:27 1/2	1/2	
2	10:28	1/2	
3	10:29	1	Circ. 50 min
4	10:29 1/2	1/2	Conn 17 ft
1705	11:29 / 10:30	1/2	
1706	11:27	1/2	
7	11:28	1	
8	11:28.5	1/2	
9	11:29	1/2	
1710	11:29	1/2	
1711	11:30	1/2	
12	11:30.5	1/2	
13	11:31	1/2	
14	11:31.5	1/2	
15	11:32	1/2	
16	11:34	2	29 ft
17	11:35	1	
18	11:37	2	
19	11:42	5	
1720	11:44	2	
1721	11:45	1	
2	11:47	2	
3	11:49	2	
4	11:59	10	P. dwn Ch.
5			
6	12:08		
7	12:14	6	
8	12:20	6	
9	12:27	7	
1730	12:34	7	

COMPANY FARM WELL NO.

SEC. TWP. RGE. LOC. COUNTY STATE

CONTRACTOR SIZE HOLE 11 DRILL PIPE

REMARKS: SIZE PUMP LINERS LENGTH STROKE

DATE Dec 19 1971

DEPTH	TIME O'CLOCK	MIN.	REMARKS
1730	12		
1731	12:40	6	
1732	46	6	
33	48	2	
34	1:00	12	
35	1:07	7	
36	1:14	7	Conn
37	21	7	
38	29	8	
39	1:45	8	
40	1:55	10	
41	2:05	10	
42	2:14	9	
43	2:25	11	
44	2:35	10	
45	2:41	6	
46	2:50	9	
47	2:56	6	Vis 40 PH 8 Wt 9.8
48	3:00	4	
49	3:05	5	1715
1750	3:10	5	96
51	3:15	5	97
52	3:21	6	
53	3:28	7	1798
54	3:37	9	
55	3:44	7	
56	3:51	6	
57	3:59	8	
58	4:03	4	
59	4:08	5	
1760	4:12	4	
61	4:20	8	
62	4:25	5	
63	4:30	5	
64	4:36	6	
65	4:43	7	
66	4:50	7	
69	4:58	8	
68	5:05	4	Conn
61	5:26	5	
1770	5:26	6	
71	31	5	
72	35	4	
73	44	9	
74	51	6	
75	55	4	
76	6:00	5	
77	6:15	15	
78	6:22	7	

Bussey 6

DEPTH	TIME O'CLOCK	MIN.	REMARKS
1780 81	628 632	4	
82	638	10	
83	644	6	
84	650	6	
85	655	5	
86	659	4	
87	707	8	
88	713	6	
89	719	6	
1790	728	9	
91	735	7	
92	740	5	
93	747	7	
94	753	6	
95	802	9	
96	06	4	
97	11	5	
1798	8:20	9	8:40 start out tripout

1704
995
709

ROTARY DRILLING TIME SHEET # 503
KANSAS BLUE PRINT CO., WICHITA, KAN.

COMPANY | FARM | WELL NO.

SEC. | TWP. | RGE. | LOC. | COUNTY | STATE

CONTRACTOR | SIZE HOLE 6 1/4 | DRILL PIPE 2 7/8

REMARKS: | SIZE PUMP LINERS 5 1/2 | LENGTH STROKE 14

Had to Tighten Linner on East side of Pump

OBC 130

DATE Dec 29 1981

DEPTH	TIME O'CLOCK	MIN.	REMARKS
1822 / 1827	2:00 / 2:22	22	Dec 29
1832	3:00	38	
1837	335	35	
1842	4/15	40	
1847	440 / 512	32	CONN
1852	550	38	
1857	620	30	
1862	638	18	
1867	652	14	
1872	730	38	
1873	7:54 / 800	6	CONN Pope Broke
74	806	6	String at 28,000
75	814	8	
1880	846	32	
85	9:13	27	
90	9:32	19	Formation Change
95	9:50	18	
1900	10:07	17	Rig Serviced
1905	10:22 / 10:38	16	CONN
1910	1050	12	
15	11:03	13	
20	11:17	14	
25	11:32	15	
30	47	15	8hr 43 min Bit
30 / 35	12:02	15	CON, Servig
40	12:25 / 50	25	
45	15	25	
50	1:35	20	
55	55	20	
60	15	20	7
65	40 / 55	22	CONN
70	3:15	20	
75	45	30	
80	10	25	
1985	35	25	
90	550	15	56-6min MIX
95	610 / 45	35	CONN 15gel
2000	7:05	20	2 50 Potash
05	30	25	
10	55	25	
15	27	32	
20	50	23	CONN
25	9:05 / 30	25	
30	10:00	30	
35	25	25	
40	50	25	
45	11:12	22	
50	42	30	CONN 18hr 12min
55	11:52 / 12:10	20	Dec 30 Serviced
60	28	18	

325 min

DEPTH	TIME O'CLOCK	MIN.	REMARKS
2060 / 65	12:28 / 12:48	20	Rig Serviced
70	1:04	16	
75	1:25	11	
2080	1:45	20	
80 / 85	1:55 / 2:17	22	CONN
90	2:37	20	
95	2:58	21	
2100	3:20	22	Formation Change
5	3:39	19	
10	4:05	26	Vis 37 - Wt 9.2
2110 / 2115	4:35 / 5:00	25	CONN - Packed Swivel
20	5:29	29	Had to Break Bottle
25	6:00	31	(320 min)
30	6:34	34	
35	7:18	42	
40	7:47	29	
2140 / 45	8:57 / 9:28	29	CONN
50	9:00	32	
55	9:30	30	
60	10:00	30	
65	10:45	45	27 hr 21 min Bit
70	10:55		Broken Mud pump Broke, Mix circulate
2170 / 2175			CONN
2165	12:10		1 ft time
66	12:19	9	
67	12:25	6	
68	12:30	5	
69	12:36	6	
2170	12:50	14	
71	1:03	13	
72	1:15	12	
73	1:24	9	
74	1:34	10	
2175	1:48	14	
76	1:58	9	
77	2:04	9	
78	2:15	9	
79	2:21	6	
2180	2:30	9	
81	2:42	12	
82	57	15	
83	3:08	11	
84	3:15	7	
2185	3:23	8	
86	3:30	7	
87	3:39	9	
88	3:59	20	
89	4:09	9	
90	4:15	4	

2191 4:29 15

ROTARY DRILLING TIME SHEET # 503
KANSAS BLUE PRINT CO., WICHITA, KAN.

342-3435

Ed Brooks
842-3289

1:57 len.

5 3/8

3 3/4

mill 1:30

H9
177

M 88-1007

6 1/4
6 1/4 1/4

Bussey

Acme Sool

Minimum charge charge 1 day on sale
" " " " magnet
" " " mill
" will call tomorrow

recording
316-321-1397

31

Baylound 17

Continental 26
Rm 26

COMPANY | FARM | WELL NO.

SEC. TWP. RGE. LOC. | COUNTY | STATE

CONTRACTOR | SIZE HOLE | DRILL PIPE

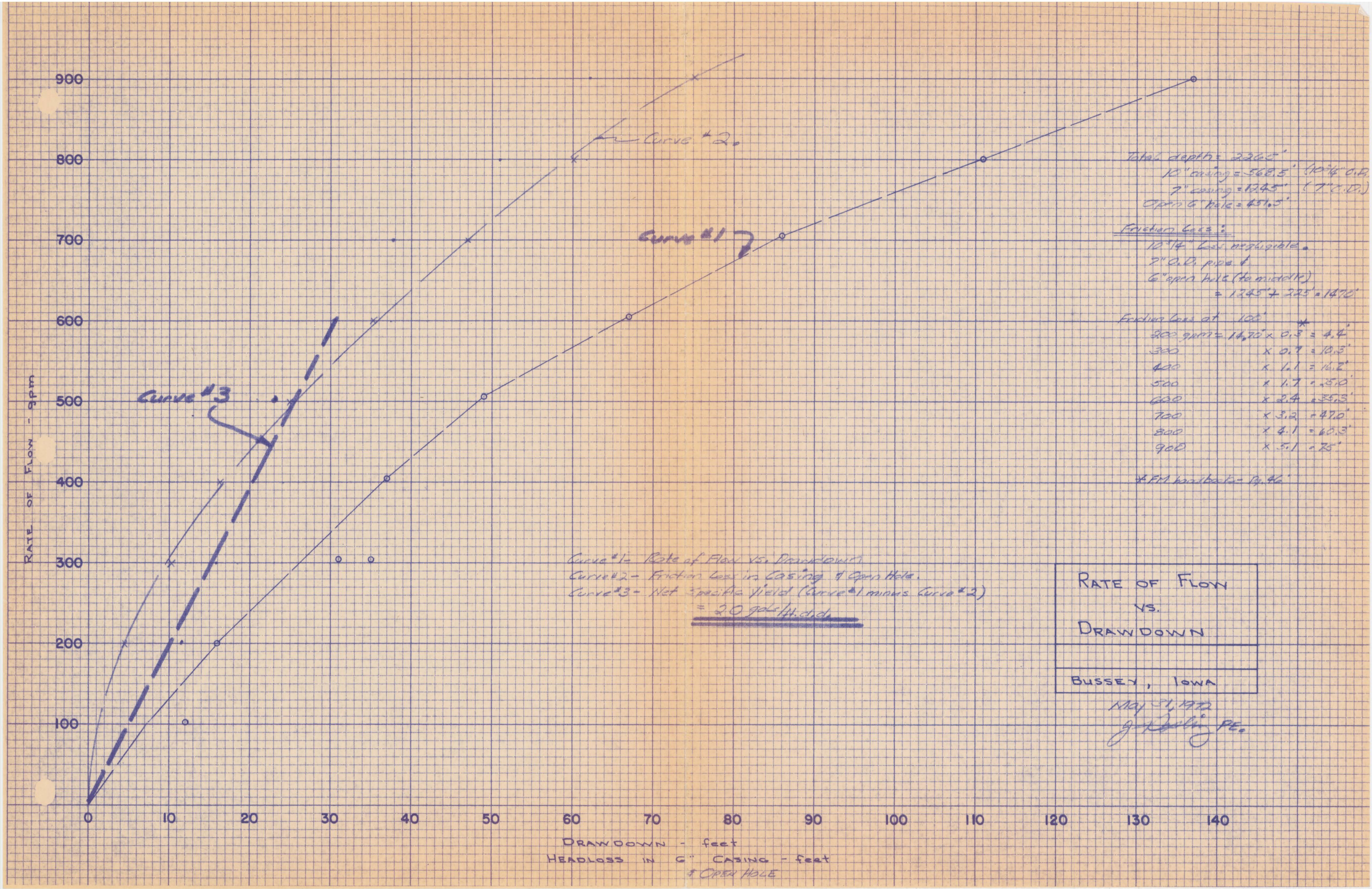
REMARKS: | SIZE PUMP LINERS | LENGTH STROKE

DATE Jan 4 | Bussey

DEPTH	TIME O'CLOCK	MIN.	REMARKS
2191/92	4:29/11:42	15	
93	5:01	19	
94	5:13	12	
95	5:27	14	
96	5:39	12	
97	5:53	14	
98	6:06	13	
99	6:18	12	
2200/1	6:37/6:49	12	CONN
2	7:08	19	
3	7:21	13	
4	7:41	20	
5	7:53	12	
6	8:04	11	Motors, Rig Served
7	8:20	16	All But Serviced
8	8:39	19	
9	8:49	10	
2210	9:01	12	
11	9:16	15	
12	9:30	14	
13	9:49	19	
14	10:14	25	
15	10:32	18	
16	10:46	14	
17	10:59	13	
18	11:07	8	
19	11:16	9	
2220	11:24	8	
21	11:33	9	
22	11:45	12	
23	12:00	15	
24	12:14	14	
25	27	13	
26	40	13	
27			
28			
29			CONN
30			

DEPTH	TIME O'CLOCK	MIN.	REMARKS
			Jordan 2195
			St Law 2240
			Stop 2290
			Stop

ROTARY DRILLING TIME SHEET # 503
KANSAS BLUE PRINT CO., WICHITA, KAN.


RATE OF FLOW - gpm
900
800
700
600
500
400
300
200
100
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
DRAWDOWN - feet
HEADLOSS IN 6" CASING - feet
& OPEN HOLE
Curve #1
Curve #2
Curve #3
Total depth = 2265'
10" casing = 568.5' (10¾" O.D.)
7" casing = 1245' (7" O.D.)
Open 6" hole = 451.5'
Friction Loss:
10¾" Loss negligible.
7" O.D. pipe &
6" open hole (to middle)
= 1245' + 225' = 1470'
Friction loss at 100' *
200 gpm = 14.70' × 0.3 = 4.4'
300 × 0.7 = 10.3'
400 × 1.1 = 16.2'
500 × 1.7 = 25.0'
600 × 2.4 = 35.3'
700 × 3.2 = 47.0'
800 × 4.1 = 60.3'
900 × 5.1 = 75'
* FM handbook - Pg. 46
Curve #1 - Rate of Flow vs. Drawdown
Curve #2 - Friction Loss in Casing & Open Hole.
Curve #3 - Net Specific Yield (Curve #1 minus Curve #2)
= 20 gals/ft.d.d.
RATE OF FLOW
VS.
DRAWDOWN
BUSSEY, IOWA
May 31, 1972
PE.