

69-03W-06 CBA

IOWA GEOLOGICAL SURVEY

W-1374

In Cooperation with U. S. Geological Survey

RECORD OF WELL

Location:

 Town: Middletown (NE) (SW): County Des Moines
NE 1/4 NW 1/4 SW 1/4 sec. 6 T 69 N., R. 3 W. Union Twp.
Well name and number Iowa Ordnance Plant Well No. 1Owner Iowa Ordnance Plant Address _____

Tenant _____ Address _____

Contractor C. W. Varner Well Co. Address Dubuque, Iowa

Drillers _____

Drilling dates March 1, - August 1, 1941

Well data:

Elevations: Drilling curb 710 feet; Land surface _____ feet

Determined by _____

Topographic position _____

Total depth: Reported 1168 feet, Measured _____ feetDrilling method Cable toolHole and casing data Hole size: 793' of 21-inch hole, 72' of 15-inch hole, 299' of 12-inch hole.
Casing data: 127 feet of 22-inch pipe from 0 to 127 feet, 793 feet of 16" O.D. 5/8 wall welded joint casing from 0 to 793', 80 feet of 13-inch pipe O.D. 45" casing from 785' to 865' lead seal between 13 and 16 inch pipe - shoe on bottom of 13-inch pipe
Original depth to water 150 ft. below _____ Date July 28, 1941

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

Sources of water: Principal _____; Others _____

Production data:

Date _____

Static depth to water 150-60

Measuring point _____

Pumping level 213

at 115 g.p.m.

207

200

Specific capacity _____ g.p.m. per ft. drawdown; Temperature _____ °F.

Pump data: Type pump _____ Column Dia. _____ Length _____

Cylinder or bowls: Dia. _____ Length _____ Suction pipe _____

Power _____ Airline _____

Estimated rate of production: _____ g.p.m. for _____ hrs. a day

Use of water _____

WATER ANALYSES (in parts per million)

Date samples	_____	_____	_____	_____
Sampled by	_____	_____	_____	_____
Total solids	_____	_____	_____	_____
Insoluble matter	_____	_____	_____	_____
Alkalinity (Meo)	_____	_____	_____	_____
Alkalinity (Phn)	_____	_____	_____	_____
pH	_____	_____	_____	_____
Fe ₂ O ₃ + Mn ₂ O ₃ + Al ₂ O ₃	_____	_____	_____	_____
Alkali as sodium	_____	_____	_____	_____
Calcium	_____	_____	_____	_____
Magnesium	_____	_____	_____	_____
Iron (unfiltered)	_____	_____	_____	_____
Manganese	_____	_____	_____	_____
Nitrate	_____	_____	_____	_____
Fluoride	_____	_____	_____	_____
Chloride	_____	_____	_____	_____
Sulfate	_____	_____	_____	_____
Bicarbonate	_____	_____	_____	_____
Hardness (ppm)	_____	_____	_____	_____
Hardness (gpg)	_____	_____	_____	_____
Remarks	_____	_____	_____	_____

Laboratory data:

Sample storage location _____

Sample range 1-1168 No. spls. 243 No. dupls. & cond. 242 Y-6.

Spls. prepared by _____ Washed range _____ by _____

Driller's log and cond. _____

Insoluble residues: Prepared by _____ Studied by _____ Strip log _____

Microscopic study _____ strip log _____

Gen. log _____ Correl. by Chas

**BURLINGTON POWDER PLANT
BURLINGTON, IOWA**

Log from Varner Well Co.

Date Started - 3-1-41

Date Completed - 8-1-41

Diameter - 793' 21" hole - 72' of 15" hole - 299' of 12" hole

Casing - Surface to 127' 54 L.F. of new 22" pipe; 73 L.F. of used 22" pipe
Surface to 793' 16" O. D. 5/16 wall welded joint casing. 80' 13"
O. D. 45# casing in place with shoe on bottom and special lead
seal on top set from 785' to 885'.

Strata Record
Depth

<u>From</u>	<u>To</u>	<u>Thickness</u>	<u>Description of Beds</u>
Top	7	7	Yellow clay
7	12	5	Yellow clay
12	21	9	Brown yellowish clay
21	28	7	Yellow Clay
28	34	6	Yellow clay shows a little water
34	36	2	Yellow clay
36	39	3	Yellow clay
39	45	6	Gray clay
45	66	21	Yellow clay
66	72	6	Clay, sandy gravel
72	73	1	Gray, hard rock
73	76	3	Gray, clay fine and gravel, sand
76	77	1	Blue shale - sand coming in
77	87	10	Blue shale - not much sand
87	90	3	Blue sticky shale
90	92	2	Blue shale - getting hard
92	97	5	Blue shale - not so sticky
97	98	1	Black shale and caving
98	101	3	Black shale and caving
101	105	4	Blue shale
105	106	1	Shale running in 10' off
106	108	2	Gray shale - hard and sand
108	110	2	" " " " (getting harder)
110	112	2	Gray shale
112	113	1	Sand and gray shale and caving
113	114	1	Gray shale
114	116	2	Gray clay - shale caving bad - sand & gravel
116	118	2	Gray lime - rock solid
118	120	2	Rock solid - caving very bad - gray lime
120	127	7	Hard gray rock
127	129	2	" " "
129	138	9	Lime - rock gray
138	140	2	" " "
140	141	1	Shale gray
141	142	1	Gray shale & rock - broken
142	144	2	Lime gray - broken & soft
144	150	6	Blue shale - sticky
150	156	6	Gray lime
156	158	2	Gray lime- rock

<u>From</u>	<u>To</u>	<u>Thickness</u>	<u>Description of Beds</u>
158	161	3	Gray lime running very rough
161	167	6	Gray and blue lime - hard
167	171	4	Gray lime - hard
171	173	2	Gray lime - broken
173	179	6	Hard fine white lime
179	180	1	" " " "
180	182	2	Gray lime not so hard
182	183	1	Hard gray lime
183	184	1	Coarse gray, sandy lime
184	187	3	White lime
187	189	2	" " and rock
189	192	3	Hard white lime
192	195	3	White lime - rock
195	196	1	Hard white lime
196	197	1	White lime
197	199	2	Gray lime rock
199	201	2	Hard gray lime
201	202	1	Hard white lime
202	204	2	Hard chalky lime
204	206	2	White lime
206	208	2	Gray lime
208	212	4	White lime
212	213	11	White flaky lime sulphur smell
213	232	9	Gray lime
232	237	6	White lime
237	240	3	Blue white lime
240	249	9	Gray lime
249	255	6	White lime - rock
255	257	2	Blue lime rock
257	259	2	White & gray lime - broken
259	261	2	" " " "
261	263	2	Gray sandy lime and shale showing sandy brown lime
263	265	2	Gray lime - hard
265	268	3	Gray lime and blue shale
268	271	3	Blue lime and shale
271	274	3	Blue shale and lime
274	283	9	Blue lime rock - getting hard
283	285	2	Gray broken lime - showing of white
285	291	6	" " " " of Bentonite
291	293	2	Hard gray lime
293	295	2	Gray sandy lime
295	300	5	Hard gray lime
300	302	2	" " " showing of shale
302	304	2	Lime and blue shale
304	306	2	Mostly blue lime and shale
306	310	4	Gray sandy lime - small shale - broken
310	315	5	Gray lime
315	317	2	Light gray - chalky lime
317	319	2	Light blue shale
319	342	23	Blue sticky shale

<u>From</u>	<u>To</u>	<u>Thickness</u>	<u>Description of Beds</u>
342	348	4	Blue sticky shale harder
348	360	14	Blue sticky shale
360	367	7	Gray shale
367	371	4	Gray lime
371	382	11	Blue shale
382	390	8	Blue sticky shale
390	401	11	Blue shale
401	410	9	Blue shale - kinderhook
410	430	20	Blue shale
430	440	10	Blue shale - kinderhook
440	446	6	Blue shale - harder
446	448	2	Bluish gray shale
448	450	2	Black shale
450	456	6	" " hard to mix
456	458	2	Blue shale
458	464	6	Blue shale
464	468	4	Blue shale - sticky
468	474	6	Blue shale and black shale
474	486	12	Blue shale
486	488	2	Blue shale
488	498	10	Gray shale
498	506	8	Blue shale
506	520	14	Gray and brown shale
520	521	1	Gray shale - sticky
521	563	42	Gray shale
563	565	2	Gray shale harder
565	575	10	Blue shale - muddy
575	577	2	Blue shale very sticky
577	580	3	Blue shale very sticky shows brown shale
580	583	3	Brown shale
583	588	5	Brown shale hard to mix
588	589	1	Shows sandy streak blue lime, very hard
589	592	3	Blue lime rock - very hard
592	595	3	Blue lime
595	598	3	Brown lime rock
598	600	2	Brown lime sand coming in
600	602	2	Brown lime real lime
602	604	2	Limestone - hard and blue
604	607	3	" " "
607	609	2	Blue lime rock
609	612	3	Brown lime rock
612	616	4	Gray lime hard and fine
616	618	2	Gray lime
618	620	2	Brown lime rock
620	623	3	Gray lime rock
623	625	2	Gray lime - hard and fine
625	627	2	Brown lime - flaky - softer
627	634	7	Gray lime - hard
634	637	3	Blue lime rock
637	638	1	Gray lime - hard and fine
638	641	3	" " " real fine powder
641	647	6	Gray lime - hard
647	653	6	Gray lime rock
653	655	2	Gray lime coarse
655	658	3	Gray lime hard and fine
658	664	6	" " "

<u>From</u>	<u>To</u>	<u>Thickness</u>	<u>Description of Beds</u>
664	670	6	Blue lime rock
670	675	5	Gray lime - hard
675	686	11	Gray lime - rock
686	689	3	Gray lime
689	695	6	Hard Lime
695	700	5	Gray lime
700	707	7	Gray lime - rock
707	713	6	Gray lime
713	720	7	Gray lime
720	728	8	Gray lime rock
728	730	2	Gray lime
730	733	3	White lime, chalky
733	740	7	Gray lime - some hard rock
740	745	5	Gray lime rock
745	747	2	Gray lime
747	749	2	Gray sand - hard, fine
749	753	4	Blue limestone
753	757	4	Gray lime and gray chert sowing gray shale
757	761	4	Hard broken lime and sand
761	769	8	Pea green shale tuff
769	772	3	Gray shale hard
772	774	2	Blue and gray broken shale
774	777	3	Bluish gray shale
777	781	4	" shale - lime
781	783	2	Lime some shale
783	789	6	Brownish gray limestone
789	793	4	Blue lime - hard
793	795	2	" "
795	797	2	Lime - hard
797	798	1	Brown lime
798	800	2	Brown lime - hard
800	804	4	Shale and lime
804	806	2	Brown lime rock
806	810	4	Brown lime - some gray
810	817	7	Sandy shale and lime
817	825	8	Sandy shale
825	827	2	Lime and shale
827	830	3	Brown lime
830	835	5	Brown lime and shale
835	838	3	Gray and brown lime a little shale
838	850	12	Brown lime and shale
850	855	5	Brown sandy lime
855	861	6	Gray sandy lime and shale - hard
861	865	4	Brown lime rock
865	867	2	Iron - brown lime
867	871	4	Iron - shale and lime
871	876	5	Brown lime rock very hard - some iron
876	881	5	Brown sandy lime - very hard
881	888	7	Brown sandy, sandy lime - hard plenty of shale
888	893	5	Brown lime rock
893	899	6	Brown lime - some shale
899	904	5	Brown lime and shale
904	912	8	Brown lime very clean hard
912	922	10	Brown lime stone
922	927	5	" "

<u>From</u>	<u>To</u>	<u>Thickness</u>	<u>Description of Beds</u>
927	937	10	Brown lime clean and no shale
937	949	12	Brown limestone
949	958	9	" "
958	964	6	Brown lime rock
964	974	10	" " "
974	983	9	" " " Hard
983	994	11	" "
994	999	5	Dark brown lime
999	1002	3	Brown and gray lime - very hard
1002	1005	3	" " " " trace of hard blue clay
1005	1007	2	" " " " Black shale
1007	1010	3	Brown lime - very hard
1010	1011	1	Brown and gray lime - very hard
1011	1016	5	" " " " - hard
1016	1018	2	" " " " - some clay
1018	1023	5	Brown lime
1023	1025	2	Gray lime - very fine - brown lime
1025	1029	4	Brown and gray lime rock
1029	1034	5	" " " " "
1034	1037	3	" " " " "
1037	1049	12	Brown and gray lime sand - shale
1049	1053	3	Gray Sand
1053	1060	7	Gray Sand white - looks very much like St. Peter
1060	1064	4	Sand Sand
1064	1076	12	White sand
1076	1085	9	White sand - clean
1085	1089	4	" " - loose
1089	1092	3	White sand
1092	1094	2	" "
1094	1097	3	Gray sand fine hard - muddy
1097	1100	3	" " " - muddy
1100	1104	4	" " showing of green shale
1104	1106	2	Sand - blue green shale
1106	1107	1	Shale sand and lime - hard
1107	1110	3	Shale
1110	1118	8	Blue shale
1118	1119	1	" " sand showing
1119	1120	1	Gray sand stone (St. Peter)
1120	1125	5	Sandstone - muddy
1125	1130	5	Sandstone - clean
1130	1135	5	Sand
1135	1140	5	White coarse sandstone
1140	1145	5	Sand
1145	1150	5	White coarse sand
1150	1155	5	White sand - hard
1155	1160	5	Shale and sand
1160	1163	3	Gray sand - showing Dolomite
1163	1165	2	Gray Dolomite - very hard
1165	1167	2	Gray Dolomite
1167	1168	1	Shale

STATIC WATER LEVELS

<u>From</u>	<u>To</u>	<u>Level</u>
Top	58	Dry

<u>From</u>	<u>To</u>	<u>Level</u>	<u>From</u>	<u>To</u>	<u>Level</u>
58	146	28	832	838	69
146	165	116	838	846	75
165	168	None	846	848	100
168	179	None	848	849	121
179	208	None	849	855	112
208	223	150	855	861	140 2 hours
223	293	200			148
293	325	100	861	867	155
325	440	160	867	893	135
440	488	200	893	899	138
488	496	160	899	912	160
496	581	200	912	922	184
581	588	160	922	937	165
588	592	140	937	964	166
592	595	160	964	974	163
595	600	126	974	994	165
600	602	120	994	1002	155
602	607	100	1002	1007	160
607	612	90	1007	1011	163
612	614	100	1011	1023	160
614	618	80	1023	1025	163
618	623	90	1025	1029	160
623	634	100	1029	1034	164
634	641	105	1034	1049	165
641	647	85	1049	1076	151
647	653	127	1076	1092	156
653	664	105	1092	1110	158
664	675	139	1110	1120	154
675	682	85	1120	1160	155
682	686	180	1160	1168	161
686	696	127			160
696	700	85			251
700	720	113			149
720	728	116			150
728	735	139			
735	745	125			
745	747	146			
747	753	148			
753	757	219			
757	761	119			
761	766	120			
766	772	125			
772	777	133			
777	783	138			
783	789	139			
789	795	151			
795	797	164			
797	798	165			
798	810	35			
810	817	34			
817	825	35			
825	827	41			
827	832	40			

PUMPING TEST OF #1 WELL IOWA ORDNANCE PLANT, BURLINGTON

July 28, 1941

Well at depth of 1168'. Water from Glenwood sandstone and St. Peter sandstone. 15 stage pump - 300' column (5"), 12' bowls (6"), 15' tail pipe, total - 327' depth. Water passing through 20' of 6" pipe with 3" orifice at end.

~~Driller's Report~~

<u>Time</u>	<u>Inches in Tube</u>	<u>G.P.M.</u>	<u>Air line</u>	<u>D.D.</u>	<u>Pump. level</u>	<u>Temp.</u>	<u>Remarks</u>
10:30 a.m.	12	115	52	53	213	62°	Muddy
10:40 a.m.	10	106	70	48	208	62°	Muddy
11:00 a.m.	9 3/4	105	95	23	183	62°	Muddy
11:15 a.m.	9 1/2	103	95	23	183	62°	Muddy
11:30 a.m.	22	158	80	38	198	62°	Muddy
12:00 n.	21	154	80	38	198	62°	Muddy
12:30 p.m.	36	200	65	53	213	65°	Slightly muddy
1:00 p.m.	37	203	60	58	218		Slightly muddy
2:00 p.m.	37 1/2	204	62	56	216	65°	Fairly clear
2:30 p.m.	93	310	24	94	254	65°	Muddy
3:00 p.m.	93	310	24	94	254	65°	Slightly muddy
4:00 p.m.	93	310	28	90	250	67°*	Fairly clear
5:00 p.m.	36	200	73	17	207.6		

PUMPING TEST OF #1 WELL IOWA ORDNANCE PLANT, BURLINGTON

July 28, 1941

Well at depth of 1168'. Water from Glenwood sandstone and St. Peter sandstone. 15 stage pump - 300' column (5"), 12' bowls (6"), 15' tail pipe, total - 327' depth. Water passing through 20' of 6" pipe with 3" orifice at end.

<u>Time P.M.</u>	<u>G.P.M.</u>	<u>Water level in feet below curb</u>	<u>Remarks</u>
4:30	325	250	Air line reading.
4:43	200	229	Air line reading.
4:45	200	224	Air line reading.
4:50	200	224.0	Electric line from here down.
4:52½	200	221.75	
4:55	200	219.27	
4:57½	200	215.9	
5:00	200	214.25	
5:02½	200	212.75	
5:05	200	212.0	
5:07½	200	211.45	
5:10	200	210.8	
5:12½	200	210.1	
5:15	200	209.9	
5:17½	200	209.6	
5:20	200	209.4	
5:25	200	208.6	
5:30	200	208.3	
5:35	200	208.0	
5:43	200	207.8	
5:45	200	207.7	Water sample collected. Temp. water 67°F., air 96°F.
5:50	200	207.7	
5:53	200	207.7	
	Shut down		
5:55		171.4	
5:56		168.4	
5:57		166.85	
5:58		165.7	
5:59		164.1	
6:00		163.0	
6:01		161.8	
6:02		160.55	
6:03		159.3	
6:04		158.2	
6:05		156.9	
6:06		155.6	
6:07		154.4	
6:08		153.2	
6:09		152.3	
6:10		151.6	

<u>Time P.M.</u>	<u>G.P.M.</u>	<u>Water level in feet below curb</u>	<u>Remarks</u>
6:12½		150.3	
6:15		149.9	
6:17½		149.4	
6:20		149.2	
6:22½		149.2	
6:25		149.1	
6:30		149.1	
6:31			Start pump. 5" orifice on discharge pipe.
6:32	300	181.4	Pumping increased steadily up to 425 g.p.m.
6:33	300	205.0	Level went below limit of the instrument (225') in next minute.

RECORD - WELL CAPACITY TEST

JOB Ia. Ordnance Plant LOCATION Burlington, Iowa DATE July 28, 1941
 PUMP SETTING 325 FT. AIRLINE 278 FT. STATIC HEAD 150' FT.
 Using 160'

Time	Inches- Tube	G.P.M.	Airline	Drawdown	Pumping Level	Temper- ature	Remarks
10:30	12	115	52	53	213	62°	Muddy
10:40	10	106	70	48	208	62	Muddy
11:00	9 3/4	105	95	23	183	62	Muddy
11:15	9 1/2	103	95	23	183	62	Muddy
11:30	22	158	80	38	198		Muddy
12:00	21	154	80	38	198		Muddy
12:30	36	200	65	53	213	65	Slightly muddy
1:00	37	203	60	58	218		Slightly muddy
2:00	37 1/2	204	62	56	216	65	Fairly clear
2:30	93	310	24	94	254	65	Muddy
3:00	93	310	24	94	254	65	Slightly muddy
4:00	93	310	28	90	250	67	Fairly clear
5:00	36	200	59	59	219.17		Fairly clear
6:00	36	200	73	47	207.6	67	Clear
6:01	Using state Electric				171	Immediately shut down for recovery	
6:05				Measurement 162			
6:10					151		
6:20					149		
6:30	Using 5" Orifice						
	Started pump valve wide open at 6:30						
6:30	12	425	50	79	228		Rild
7:00	9 1/2	380	9	125	275	67	Fairly clear
			Shut down at 7:00 P.M.				

km
COPY

10/14/41

for Day and Zimmerman, Inc.
Iowa Ordnance Division
Burlington, Iowa

W. H. & L. D. Betz
Chemical Engineers
And Consultants on all Water Problems
235 W. Wyoming Ave
Philadelphia, Pa.

CERTIFICATE OF ANALYSIS

Date 8/16/41

Sample Marked	Well 1
Analysis Number	H 935
Turbidity as SiO ₂	26.2
Suspended matter ²	Trace
Color	
Carbonate Hardness (as CaCO ₃)	214
Non-Carbonate Hardness (as CaCO ₃)	1226
Total Hardness (as CaCO ₃)	1440
Sulphates (SO ₄)	1012
Chlorides (Cl)	204.0
Iron - (total) (Fe)	0.7
Free Carbon Dioxide (CO ₂) Calculated	15.3
Alkalinity to Phenolphthalein (as CaCO ₃)	0
Alkalinity to Methyl Orange (as CaCO ₃) ³	214
Oil	
pH Value	7.46
Sulphate Chloride Ratio (SO ₄ /Cl)	5.3
Sulphate Carbonate Ratio: Na ₂ SO ₄ /Na ₂ CO ₃	
Percent Blow Down	
Silica as SiO ₂ , p.p.m.	14.2
Calcium as CaCO ₃ , p.p.m.	930

HCO₃ = 261

Ca = 372

JET L

*Additional calculations
by K.E.A.
1-2-42*

Signed C. A. Noll
Chemist

Approved by J. E. Arnon

W

km
COPY

10/14/41

For Day and Zimmerman-Iowa Ordnance
Burlington, Iowa

W. H. and L. D. Betz
Chemical Engineers
And Consultants on all Water Problems -
235 W. Wyoming Ave.
Philadelphia, Pa.

CERTIFICATE OF ANALYSIS

Date 8/27/41

Sample Marked

Well 1

Analysis Number

J 219

Turbidity as SiO ₂	Trace
Suspended matter	Trace
Color	
Carbonate Hardness (as CaCO ₃)	212
Non-Carbonate Hardness (as CaCO ₃)	1308
Total Hardness (as CaCO ₃)	1520
Sulphates (SO ₄)	1808
Chlorides (Cl)	200.5
Iron - Total (Fe)	0.25
Free Carbon Dioxide (CO ₂) Calculated	21.0
Alkalinity to Phenolphthalein (as CaCO ₃)	0
Alkalinity to Methyl Orange (as CaCO ₃)	212 HCO ₃ = 259
Oil	
pH Value	7.32
Sulphate Chloride Ratio: (SO ₄ /Cl)	
Sulphate Carbonate Ratio (Na ₂ SO ₄ /Na ₂ CO ₃)	
Percent Blow Down	
Silica as SiO ₂ ,	16.8
Total Solids, p.p.m.	3972
Calcium as CaCO ₃ , p.p.m.	930 Ca = 372
Magnesium as CaCO ₃ , p.p.m.	590 Mg = 141.5

JET L 5

*Additional Calculations
by K. E. A.
1-7-42*

(Signed) C. A. Noll
Chemist

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H. G. HERSHEY

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PITTSBURGH TESTING LABORATORY
Established 1881
PITTSBURGH, PENNA.

Order No. Ch 10199

Laboratory No. 9730

Client's No.

File No. 969.66

December 30, 1941

REPORT

of

Analysis of
Project
Sample Marked
Sampled by
Reported to

WATER
Iowa Ordnance Plant, Burlington, Iowa
Well No. 4
R. C. Cornish
Day & Zimmermann, Inc. Burlington, Iowa

Following are test results obtained on analysis of sample of
Water submitted to us:

Parts per million

Calcium Hardness	as CaCO_3	226	$\text{Ca} = 96.4$
Magnesium Hardness	as MgCO_3	27	$\text{Mg} = 7.9$
Sulfate	as SO_4	472	
Chloride	as Cl	25	
Iron	as Fe_2O_3	0.3	$\text{Fe} = 0.1$
* Alkalinity to P	as CaCO_3	0.0	
* Alkalinity to M	as CaCO_3	270	$\text{HCO}_3 = 330$
Silica	as SiO_2	11	
Total Solids		1184	

Calc. Hardness = 259

NOTE: Titration of this water indicates a high concentration of
bicarbonates which would precipitate out as CaCO_3 upon boiling or
heating of the water.

Respectfully submitted,
PITTSBURGH TESTING LABORATORY,

/s/ R. C. Emmett,

R. C. Emmett, District Manager.

$226 \times 2.497 = 563$
 $27 \times 4.115 = 111$
 $0.3 \times 7.792 = 2.3$
 678.5

Hardness = $39.6 \pm$

CC:7-W.W. Slocum, Burlington, Iowa
2-PTL-Pgh
1-PTL-Mi-Chgo

IOWA GEOLOGICAL SURVEY
Well or Water Sample Data

Bottle No. G 114

TOWN MIDDLETOWN COUNTY DES MOINES
LOCATION _____ Sec. 6 T. 69 N. R. 3 W. Union Twp.

OWNER OF WELL Iowa Ordnance Plant Well No. 1

USE OF WATER: City Supply (); Private-Domestic (); Public Drinking (); Live-stock (); Industrial (X); School Supply (); Air Conditioning (); Cooling ();

CONSTRUCTION OF WELL: Drilled (X); Gravel-Pack type (); Driven (); Dug (); Bored (); Jetted ()

DATE STARTED March 5, 1941

CONTRACTOR C. W. Varner

DATE FINISHED _____

CASING OR CURBING DATA: (Show by diagram on opposite side of sheet the kind, length and depth of top and bottom of each size of pipe, the amount of overlaps, position of seals or packers, pipe perforation and screens, etc.)

16" OD Wrot Iron casing - 793'

12" liner - 80', to 865'

WELL DATA

Curb Elevation 710 Ft. Present Depth 1168 Ft. Final Depth 1168 Ft.

Ground Elevation _____ Ft. Topographic Position upland plain

Static Level (Depth to Water (Above) Curb) 149.1 Ft. Pumping Level 207.6 Ft.

Amount of Drawdown 58.5 Ft. pumping at 200 g.p.m. in 7 hours 15 minutes.

Calculated gals. per ft. drawdown 3.4 g.p.m.

Type of Pump Turbine Power Electric

Depth of Bottom of Pump 312 ft. with 15 ft. of suction pipe.

TEMPERATURE: Air 96 °F.; Water 67 °F., measured after well had pumped 7 hrs.

15 mins. at 200 g.p.m.; 20' ft. from pump after water had passed through the

following pipe 20' of 6" pipe Time 5:45 (P.M.)

SOURCE OF WATER: Recent (Type and Depth)

Glacial Formations (Type) _____ at _____ ft. to _____ ft.

Limestone or Dolomite (Age) _____ at _____ ft. to _____ ft.

Sandstone (Age) Ordovician at 1035 ft. to 1163 ft.

Principal Producing Formation Glenwood sandstone & St. Peter sandstone

REMARKS _____

Sample taken for: Mineral Analysis (X); Sanitary Analysis ().

Data Collected by M. M. Elias; Date July 28 1941

Report Analysis to H. G. Hershey, Iowa Geological Survey, Iowa City

IOWA GEOLOGICAL SURVEY
Well or Water Sample Data

Bottle No. _____

TOWN Middletown COUNTY Des MoinesLOCATION NE 1/4 NW 1/4 SW 1/4 Sec. 6 T. 69 N. R. 3 W. Union Twp.OWNER OF WELL Iowa Ordnance Plant Well No. 1

USE OF WATER: City Supply (); Private-Domestic (); Public Drinking (); Live-stock (); Industrial (); School Supply (); Air Conditioning (); Cooling ();

CONSTRUCTION OF WELL: Drilled (x); Gravel-Pack type (); Driven (); Dug (); Bored (); Jetted ()

DATE STARTED Mar. 5, 1941.CONTRACTOR C.W. Varner, Dubuque

DATE FINISHED _____

CASING OR CURBING DATA: (Show by diagram on opposite side of sheet the kind, length and depth of top and bottom of each size of pipe, the amount of overlaps, position of seals or packers, pipe perforation and screens, etc.) Temp. 54' of 26"; Temp. 126' of 20". 20" hole [See Varner's Rept.]

WELL DATA

Curb Elevation _____ Ft. Present Depth 1165 Aug 1 '41 Ft. Final Depth _____ Ft.Ground Elevation 712 Ft. Topographic Position Upland

Static Level (Depth to Water (Above) Curb) * _____ Ft. Pumping Level _____ Ft.

Amount of Drawdown _____ Ft. pumping at _____ g.p.m. in _____ hours _____ minutes.

Calculated gals. per ft. drawdown _____ g.p.m.

Type of Pump _____ Power _____

Depth of Bottom of Pump _____ ft. with _____ ft. of suction pipe.

TEMPERATURE: Air _____ °F.; Water _____ °F., measured after well had pumped _____ hrs.

_____ mins. at _____ g.p.m.; _____ ft. from pump after water had passed through the

following pipe _____ Time _____ (A.M.) (P.M.)

SOURCE OF WATER: Recent (Type and Depth)

Glacial Formations (Type) _____ at _____ ft. to _____ ft.

Limestone or Dolomite (Age) _____ at _____ ft. to _____ ft.

Sandstone (Age) _____ at _____ ft. to _____ ft.

Principal Producing Formation _____

REMARKS Water level 90' at top of Dev. dropped as drilling progressed to 139' at depth 690'(SW 1/4 - 149' with casing to Galena; Galena to St. Peter open; Temp 67° air 96 July 28, 1941)

Sample taken for: Mineral Analysis (); Sanitary Analysis ().

Data Collected by _____; Date _____

Report Analysis to H. G. Hershey, Iowa Geological Survey, Iowa City