

State University of Iowa
Treatment Plant Well #1
Pumping Test
October 7-9, 1963

Location: NESESE sec. 9, T. 79N., R. 6W.

Depth: 1550'

Elevation: 655' ± 2'

Contractor: Hoeg and Ames

Drilling dates: 10 May, 1963 to 1 October, 1963

Casing data: 26" to 52' 10"
41' of 24" - 159' to 200'
262' 4" of 22" - 350' to 612'
99' 7" of 20" - 865' to 965'
343' of 20" - 0 to 343'
719' 8" of 16" - 343' to 1063'

Water level: Static water level 45.35 below top of casing which is
2.4 feet above land surface datum

Test pump: Turbine powered directly by gas engine

Aquifer: Prairie du Chien, Jordan, St. Lawrence

Measurements: Water level measured by electric line and steel tape
(for SWL). Discharge by orifice

Observers: R. E. Hansen, P. D. Robinson

PUMPING TEST, SUI TREATMENT PLANT WELL
October 7-8-9, 1963

Time (Hr.)	Time (Min.)	Hold	+ Feet	Water Level	Draw-down	GPM	Remarks
		50.00	-4.65	45.35			Steel tape - static water level
		44.00	-0.88	43.67			Elec. line - static water level
8:15 a.m.							Start test - 7 October, 1963
	2	81.00	+0.80	81.80	38.13		6" orifice, 8" pipe
	3		+0.70	81.70	38.03		bowls at 348'
	4	82.00	+0.24	82.24	38.57		
	5		+0.53	82.53	38.91		
	7	83.00	+0.24	83.24	39.57		
	9		+0.49	83.49	39.82		
	10		+0.13	83.13	39.46		
	12	82.00	+0.93	82.93	39.23		
	14	83.00	+0.20	83.20	39.53		Water milky
	16	82.00	+0.94	82.94	39.27		
	18		+0.66	82.66	38.99	708	
	20		+0.31	82.31	38.64		T=65° F
	25		+0.26	82.26	38.59		
	30		+0.33	82.33	38.71		
	35		+0.42	82.42	38.75		
	40		+0.12	82.12	38.45		Slight sulphur odor
	45		+0.39	82.39	38.72		
	50		+0.95	82.95	39.28		
	55		+0.30	82.30	38.63		
9:15	60		+0.10	82.10	38.43	708	
	70		+0.60	82.60	38.93		
	80	81.00	+0.86	81.86	38.19		
	90	82.00	+0.90	82.90	39.23		Water clear
	100		+0.05	82.05	38.38		
	110		+0.97	82.97	39.30	700	
10:15	120		+0.04	82.04	38.37		
30	135		+0.04	82.04	38.37	708	T = 65½° F
45	150		+0.93	82.93	39.26		
11:00	165		+0.40	82.40	38.73		25 grain hardness (spot test)
15	180		+0.35	82.35	38.68		
30	195		+0.41	82.41	38.74		
45	210		+0.03	82.03	38.41	700	T = 65½° F
12:00 p.m.	225		+0.35	82.35	38.68		Shut down to change orifice for higher rates of discharge.
1:00 "							
1:30	3	120.00	+2.35	122.35	78.68		Restart
	4	130.00	+1.59	131.59	87.92		Water "milky"
	5		+3.80	133.80	90.13		
	6	140.00	-5.00	135.00	91.33		

Time (Hr.)	Time (Min.)	Hold	+ Feet	Water level	Draw-down	GPM	Remarks
	8		-4.38	135.62	91.95		
	10		-3.93	136.07	92.48		
	12		-3.81	136.19	92.52		
	14		-3.60	136.40	92.73		
	16		-3.15	136.85	93.18		
	20		-2.80	137.20	93.53	1200	
	25		-2.58	137.42	93.75		
	30		-2.38	137.62	93.95		
	35		-1.29	138.71	95.04		T = 65½ ° F
	40		-0.95	139.05	95.38		
	45		-0.25	139.75	96.08		
	50		+0.03	140.03	96.36		
2:00	60		+0.08	140.08	96.41	1200	
:15	75		+0.91	140.91	97.24		
:30	90		+1.12	141.12	97.45		Water clear
:47	107		+2.04	142.04	98.37		
3:00	120		+2.23	142.23	98.56		
:15	135		+2.48	142.48	98.81	1200	
:30	150		+3.03	143.03	99.36		
4:00	180		+3.58	143.58	99.91		
:30	210		+3.76	143.76	100.09	1200	
5:00	240		+4.11	144.11	100.44		
	244	190.00	+3.10	193.10	149.43		Increase rate of 502 p.m.
:05	245	200.00	+3.60	203.60	159.93		
	246	210.00	+1.12	211.12	167.45		
	248	220.00	-1.28	218.72	175.05		
:10	250		+2.06	222.06	178.39		
	252		+3.60	223.60	179.93		
	254	230.00	+4.55	234.55	190.88		
	256	240.00	-2.13	237.87	184.20		
	258		-0.50	239.50	195.83		
:20	260		+0.40	240.40	199.73	1700	
:25	265		+1.55	241.55	197.88		
:30	270		+2.14	242.14	198.47		
:40	280		+0.03	240.03	196.36		
:50	290		+0.92	240.92	197.25		
6:00	300		+1.23	241.23	197.61		
:30	330		+1.83	241.83	198.16	1700	
7:00	360		+2.48	242.48	198.81		
:30	390		+2.95	242.95	199.28	1700	
8:00	420		+3.45	243.45	199.78		
:30	450		+3.58	243.58	199.91		
9:00	480		+3.53	243.53	199.86		
:30	510		+3.49	243.49	199.82		

Time (Hr.)	Time (Min.)	Hold	+ Feet	Water Level	Draw-down	GPM	Remarks
10:00	540		+3.90	243.90	200.23		
:30	570		+3.90	243.90	200.23		
11:00	600		+4.00	244.00	200.33		
:30	630		+4.40	244.40	200.73		
12:00 M	660		+4.50	244.50	200.83	1700	Water level at city well 50.00 - 1.20 = 48.80' below 10-8-3 top of breather pipe
:30	690		+4.50	244.50	200.83		
1:00	720		+4.82	244.82	201.15		
:30	750		+5.20	245.20	201.53		
2:00	780		+5.35	245.35	201.68		
:30	810	250.00	-4.25	245.75	202.08		
3:05	845	240.00	+5.80	245.80	202.13		3.09 cut discharge to about 1000 gpm
:11	851	190.00	+0.62	190.62	146.95	1000 +	
:13	853	150.00	+2.30	152.30	108.63		
:16	856	140.00	-0.73	139.27	95.60		
:20	860		-2.75	137.25	93.58		
:30	870	130.00	+4.10	134.10	90.43		
4:00	900		+4.30	134.30	90.63		
:30	930		+4.15	134.15	90.48		
5:00	960		+3.05	133.05	89.38		
5:35	995		+2.55	132.55	88.88		
6:00	1020		+2.93	132.83	89.16		
:30	1050		+2.65	132.65	88.98		T = 66°F
7:00	1080		+2.75	132.75	89.08		Collected water sample (bottle S-112)
:30	1110		+3.05	133.05	89.38		
8:00	1140		+1.95	131.95	88.28		
:30	1170		+1.95	131.95	88.28		
9:00	1200		+1.10	131.10	87.43		
:30	1230		+0.55	130.55	86.88		
10:00	1260		+0.11	130.11	86.44		
:30	1290		-0.83	129.17	85.50		
11:00	1320		-0.67	129.33	85.66		
:30	1350		-0.86	129.14	85.47		
12:00 N	1380		-1.15	128.85	85.18		
:30	1410		-0.17	129.83	86.16		
1:00	1440		-0.40	129.60	85.93		Slight increase in pump speed
:30	1470		+1.95	131.95	88.28		
2:15	1515		+1.98	131.98	88.31		
2:30	1530		+1.55	131.55	87.88		
3:00	1560		+1.14	131.14	87.47		
:30	1590		+1.25	131.25	87.58		
4:00	1620		+1.00	131.00	87.33		
:30	1650		+0.89	130.89	87.22		
5:00	1680		+2.92	132.92	89.25		
:30	1710		+3.45	133.45	89.78	1000	

Time (Hr.)	Time (Min.)	Head	+ Feet	Water Level	Draw-down	GPM	Remarks
6:00	1740		+3.70	133.70	90.03		
:30	1770		+3.90	133.90	90.23		
7:00	1800		+3.85	133.85	90.18		
:30	1830		+4.40	134.40	90.73		
8:00	1860		+4.47	134.47	90.80		
:30	1890		+4.75	134.75	91.00		
9:00	1920		+4.16	134.16	90.49	1000	
:30	1950		+4.43	134.43	90.76		
10:00	1980		+4.44	134.44	90.77		
:30	2010		+4.44	134.44	90.77		
11:00	2040		+3.39	133.39	89.72		
:30	2070		+4.01	134.01	90.34	1000	
12:00 M	2100		+3.39	133.39	89.72		
:30	2130		+4.40	134.40	90.73		9 October, 1963
1:00	2160		+4.10	134.10	90.43	1000	
:30	2190		+4.20	134.20	90.53		
2:00	2220		+4.25	134.25	90.58		
:30	2250		+4.35	134.35	90.63	1000	
3:00	2280		+4.10	134.10	90.43		
:30	2310		+4.60	134.60	90.93		
4:00	2340		+4.68	134.68	91.01		
:30	2370		+4.40	134.40	90.73		
5:00	2400		+4.55	134.55	90.88		
:30	2430		+4.50	134.50	90.83	1000	
6:00	2460		+4.45	134.45	90.78		
:30	2490		+4.50	134.50	90.83		
7:00	2520		+4.45	134.45	90.78		
:30	2550		+4.00	134.00	90.33		
8:00	2580		+3.60	133.60	89.93		Water sample taken (bottle 8622)
:30	2610		+2.80	132.80	89.13		T = 66° F
8:45	2625						Pump off
8:46	1	78.00	-0.35	77.65	33.98		Recovery measurements
	2	58.00	-0.12	57.88	14.21		
	3	56.00	+0.11	56.11	12.44		
	4	55.00	+0.87	55.87	12.20		
	5		+0.74	55.74	12.07		
	6		+0.61	55.61	11.94		
	8		+0.42	55.42	11.75		
	10		+0.31	55.31	11.64		
9:00	15		+0.04	55.04	11.37		
	20		-0.13	54.87	11.20		
	25		-0.31	54.69	11.02		
	31		-0.60	54.40	10.73		
	35		-0.63	54.37	10.70		

Time (Hr.)	Time (Min.)	Head	± Feet	Water Level	Draw-down	GPM	Remarks
	50		-0.92	54.08	10.41		
	60	53.00	+0.91	53.91	10.24		
10:00	75		+0.72	53.72	10.05		
11:00	135		+0.15	53.15	9.49		
1:00	255	52.00	+0.32	52.32	8.65		
3:00			-0.20	51.80	8.13		
5:00		51.00	+0.48	51.48	7.81		
7:00 a.m.		50.00	+0.26	50.26	6.59		10 October, 1963
9:00			+0.07	50.07	6.40		
10:35			-0.07	49.93*	6.26		*Measured while pump being pulled from well
11:35			-0.22	49.78*	6.11		11 October, 1963
7:00 a.m.		49.00	+0.06	49.00	5.33		Well bailed 5 times or about 250 gallons after 7:00 a.m.
8:00		50.00	+0.46	50.46	6.31		
10:00			+0.02	50.02	6.35		
12:00 N.			-0.18	49.82	6.15		
2:00			-0.37	49.63	5.96		

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 GEOLOGICAL SURVEY

 File No. { Washington #1
 District

 SUI Treatment
 Plant Well

TIME HR	TIME MIN	HOLD	± FT	WL	Dd	gpm					
											SWL 50.00 - 4.65 = 45.35 TAPE
				43.67							SWL 44.00 - 0.33 = 43.67 E LINE
8.15											start
	1										
	2	81.0	0.80	81.80	38.13						
	3		0.70	81.70	38.03						6" orifice - 8" pipe
	4	82.	0.24	82.24	38.57						
	5		0.58	82.58	38.91						
	7	83.	0.24	83.24	39.57						
	8										
	9	83.0	0.49	83.49	39.82						
	10		0.13	83.13	39.46						
	12	82.	0.95	82.95	39.28						
	14	83.	0.20	83.20	39.53						water milky
	16	82.	0.94	82.94	39.27						
	18	82.	0.66	82.66	38.99	708-10 (20-20 1/2")					
	20	82.	0.31	82.31	38.64						T = 65°F
	25	82.	.26	82.26	38.59						
	30	82.	.38	82.38	38.71						
	35	82.	.42	82.42	38.75						
	40	82.	.12	82.12	38.45						S - smell
	45	82.	.39	82.39	38.72						
	50	82.	.95	82.95	39.28						
	55	82.	.30	82.30	38.63						
9.15	60	82.	.10	82.10	38.43						(20")
	70	82	.60	82.60	38.93						
	80	81	.86	81.86	38.19						
	90	82	.90	82.90	39.23						water clear
	100	82	.05	82.05	38.38						
	110	82	.97	82.97	39.30	700					(19 1/2")
10.15	120	82	.04	82.04	38.37	700					(19 1/2")

46
9-230
86. 1 3/4"

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. { Washington #2
District

T HR	T MIN	NOLO	± FT	WL	Dd	gpm				
10:30	135	82.	+ .04	82.04	38.37	708	20"			T = 65 1/2 °F
.45	150	82.	.93	82.93	39.26					
11:00	165	82.	.40	82.40	38.73					25 gr - hardness
.15	180	82.	.35	82.35	38.68	700				
.30	195	82.	.41	82.41	38.74					
.45	210	82.	.08	82.08	38.41	700	19 1/2"			T = 65 1/2 °F
NOON	12:00	225	82	.35	82.35	38.68				shut off to change office
										9" office - 12" pipe
1.00p										start
	3	120.	+ 2.35	122.35	78.68					
	4	130	1.59	131.59	87.92					milky
	5		3.80	133.80	90.13					
	6	140	-5.00	135.00	91.33					
	8		-4.38	135.62	91.95					
	10		+3.93	136.07	92.40					
	12		+3.81	136.19	92.52					
	14		-3.60	136.40	92.73					
	16		+3.15	136.85	93.18					
	20		-2.80	137.20	93.53	1200	11-12"			
	25		+3.58	137.42	93.75					
	30		-2.38	137.62	93.95					
	35		-1.29	138.71	95.04					T = 65 1/2 °
	40		+ .95	139.05	95.38					
	45		- .25	139.75	96.08					
	50		+ .03	140.03	96.36					
2.00	60		+ .08	140.08	96.41		11-12"			
.15	75		+ .91	140.91	97.24					
.30	90		+1.12	141.12	97.45					water clear
.47	107		+2.04	142.04	98.37					

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. { Washington #3
District _____

T Hr	T min	HRD	± FT	WL	Dd	gpm					
3.00	120	140	+2.23	142.23	98.56						
.15	135		+2.48	142.48	98.81		(11 1/2")				
.30	150		+3.03	143.03	99.36						
4.00	180		+3.58	143.58	99.91						
.30	210		+3.76	143.76	100.09		(11 1/2")				
5.00	240		+4.11	144.11	100.44						
	4	190.	3.10	143.10	149.43					INCR rate @ 5.02	
.05	5	200.	3.60	203.60	159.93						
	6	210	1.12	211.12	167.45						
	8	220	-1.28	218.72	175.05					water cloudy	
.10	10		+2.06	222.06	178.39						
	12		+3.60	223.60	179.93						
	14	230	+4.55	234.55	190.88						
	16	240	-2.13	237.87	194.20						
	18		- .50	239.50	195.83						
.20	20		+ .40	240.40	199.73	1700					
5.25	25	240	+1.55	248.55	197.88						
.30	30		+2.14	242.14	198.47						
.40	40		+ .03	240.03	196.36						
.50	50		+ .92	240.92	197.25						
6.00	60	240	+ 1.28	241.28	197.61						
.30		240	+ 1.83	241.83	198.16	1700	(22 1/2")				
7.00		240	+ 2.48	242.48	198.81						
.30		246	+ 2.95	242.95	199.28	1700	(22 1/2")				
8.00		240	+ 3.45	243.45	199.78						
.30		240	+ 3.58	243.58	199.91						
9.00		240	+ 3.53	243.53	199.86						
.30			+ 3.49	243.49	199.82						
10.00			+ 3.90	243.90	200.23						
.30			+ 3.90	" "	200.23						
11.00			+ 4.00	244.00	200.23						
.30			+ 4.40	244.40	200.73		22 1/2"				

Ferry well WL
→ 50.00 - 1.20 = 48.80

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 GEOLOGICAL SURVEY

File No.

Washington #4

District

43.67

 4 copies, 1 for Hoop + Ames also water analysis South
 3 for Engineer

T hr	T min	Head ± FT	WL	Dd	gpm						
12.00		240	+4.50	244.50	200.83	17.0	22 1/2				
12.30			+4.50	244.50	200.83						
1.00			+4.82	244.82	201.15						
1.30			+5.20	245.20	201.53						
2.00			+5.35	245.35	201.68						
1.30		250	+4.25	245.75	202.08						
3.05		240	+5.80	245.80	202.13						
1.11		190	+1.62	190.62	146.95	1000+	8"	3.09	act rate	to x 1000 gpm	
1.13		150	+2.30	152.30	108.63						
1.16		140	+0.73	139.27	95.60						
1.20			+2.75	137.25	93.58						
1.30		130	+4.10	134.10	90.43						
4.00			+4.30	134.30	90.63						
1.30		130	+4.15	134.15	90.48						
5.00		130	+3.05	133.05	89.38						
5.35			+2.55	132.55	88.88						
6.00			2.83	132.83	89.16						
6.30			+2.65	132.65	88.98						
7.00			+2.75	132.75	89.08						
7.30			+3.05	133.05	89.38						
8.00			+1.95	131.95	88.28						
8.30			+1.95	131.95	88.28						
9.00			+1.10	131.10	87.43						
9.30			+0.55	130.55	86.88						
10.00			+0.11	130.11	86.44						
10.30		130	-0.83	129.17	85.50						
11.00		130	-0.67	129.33	85.66						
11.30		130	-0.86	129.14	85.47						
12.00		130	-1.15	128.85	85.18						
12.30		130	-0.17	129.83	86.16						
1.00		130	-0.40	129.60	85.93						
1.30		130	+1.95	131.95	88.28						

slight pump speed increase

81173

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. { Washington _____
District _____

5

43.67

Time hrs	Time min	Hold	(±) Ft.	W.L.	pd	gpm							
2:15		130	+1.98	131.98	88.31								el. line trouble
2:30		130	+1.55	131.55	87.88								
3:00		130	+1.14	131.14	87.47								
3:30		130	+1.25	131.25	87.58								
4:00		130	+1.00	131.00	87.33								
4:30		130	+0.89	130.89	87.22								
5:00		130	+2.92	132.92	90.25			1455	RPM				
5:30		130	+3.45	133.45	89.78	1000							
6:00		130	+3.70	133.70	90.03								
6:30		130	+3.90	133.90	90.23								
7:00		130	+3.85	133.85	90.18								
7:30		130	+4.40	134.40	90.73								
8:00		130	+4.47	134.47	90.80								
8:30		130	+4.75	134.75	91.08								
9:00		130	+4.16	134.16	90.49	1000							
9:30		130	+4.43	134.43	90.76								
10:00		130	+4.44	134.44	90.77								
10:30		130	+4.44	134.44	90.77								
11:00		130	3.39	133.39	89.72								
11:30		130	+4.01	134.01	90.34	1000							
12:00		130	+3.39	133.39	89.72								
12:30		130	+4.40	134.40	90.73								
1:00		130	+4.10	134.10	90.43	1000							
1:30		130	+4.20	134.20	90.53								
2:00		130	+4.25	134.25	90.58								
2:30		130	+4.35	134.35	90.68	1000							
3:00		130	+4.10	134.10	90.43								
3:30		130	+4.60	134.60	90.93								
4:00		130	+4.68	134.68	91.01								
4:30		130	+4.40	134.40	90.73								
5:00		130	+4.55	134.55	90.88								

mlg.
mte.
OCT-9

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

File No. { Washington _____
District _____

#6

Time hr/s	Time min	Head	+ ft.	W. L.	Dd	gpm					
5:30		130	+4.50	134.50	90.83	1000					
6:00		130	+4.45	134.45	90.78						
6:30		130	+4.50	134.50	90.83						
7:00		130	+4.45	134.45	90.78						
7:30		130	+4.0	134.0	90.33						
8:00		130	+3.60	133.6	89.93						
8:30		130	+2.8	132.8	89.13						
8:46	:01	78.0	-0.35	77.65	33.98		RECOVERY	Water Sample (Bottle 6023)			
	:02	58.0	-0.12	57.88	14.21		↓	T = 66°F			
	:03	56.0	+0.11	56.11	12.44			Shut off			
	:04	55.0	+0.87	55.87	12.20						
	:05	55.0	+0.74	55.74	12.07						
	:06	55.0	+0.61	55.61	11.94						
	:08	55.0	+0.42	55.42	11.75						
	:10	55.0	+0.31	55.31	11.64						
9:00	:15	55.0	+0.04	55.04	11.37						
	:20		-.13	54.87	11.20						
	:25		-.31	54.69	11.02						
	:31		-.60	54.40	10.73						
	:36		-.63	54.37	10.70						
	:50		-.92	54.08	10.41						
	:60	53	+0.91	53.91	10.24						
10:00	:75		+0.72	53.72	10.05						
11:00	:135		+1.15	53.15	9.48						
1:00	:255	52	+0.32	52.32	8.65						
3:00		52	-.20	51.80	8.13						
5:00		51	+0.48	51.48	7.81						
7:00		50	+1.26	50.26	6.59						
9:00		50	+0.07	50.07	6.40						
10:35		50	-.07	49.93	6.26						
11:35		50	-.22	49.78	6.11						

10-10-63

} while pulling pump