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Date: 3/20/03 7:15AM
Subject: Groundwater Well Drawdown

During the site audit at Quad Cities, a request was made by members of your team to provide a copy of groundwater drawdowns.

Attached you will find a copy of that list.

What follows is further clarification of the listing and what is performed WRT drawdown.

These are the readings taken quarterly when we do our well depth measurements on wells #1 & #5. They are a transposed number from measurements taken by procedure into a spreadsheet after the quarterly well depth measurements. The file is attached below. There is no legal requirement to perform these measurements. It is done for our own information. Some of the early data on the spreadsheet may be in question. The main thing that the graph shows that the static water level and draw down has varied little over the years.

If looking at the spreadsheet, below is a summary of what the numbers are telling you:

Well #1 pump is set at 147' feet below ground elevation. The pump off reading is the reading taken from the air-line that is attached to the well piping and extends down to the same level that the pump is set. By applying air pressure to the air-line, you can tell how many feet of water are in the air line. The pump off reading subtracted from the air-line length is the static water level in the well. Thus if the pump off reading is 110', then the static water level is 37' (147 - 110). After the pump is started, you then take another reading on the air-line. If the reading after the pump is on is 77', then the draw down in the well is 33' (110 - 77). The original data from well #1 in 1967 had a static water level of 42' and a drawdown of 43'.

Well #5 is set at 205'. The original data from well #5 in 1969 had a static water level of 33' and a drawdown of 20'.

As can be seen by the attached spreadsheet, the static water levels in the wells have been very consistent over the years. The reason for the big difference between drawdown of the two wells is the well casing size and size of the pumps. The diminished drawdown of the individual pumps over the years is from pump degradation and scaling of well piping. The GPD for each well is based on hours the pump is operated and pump design capacity. The actual usage is less than reported, but is the best estimate we have.

If you should have any questions, please feel free to contact me at any time.

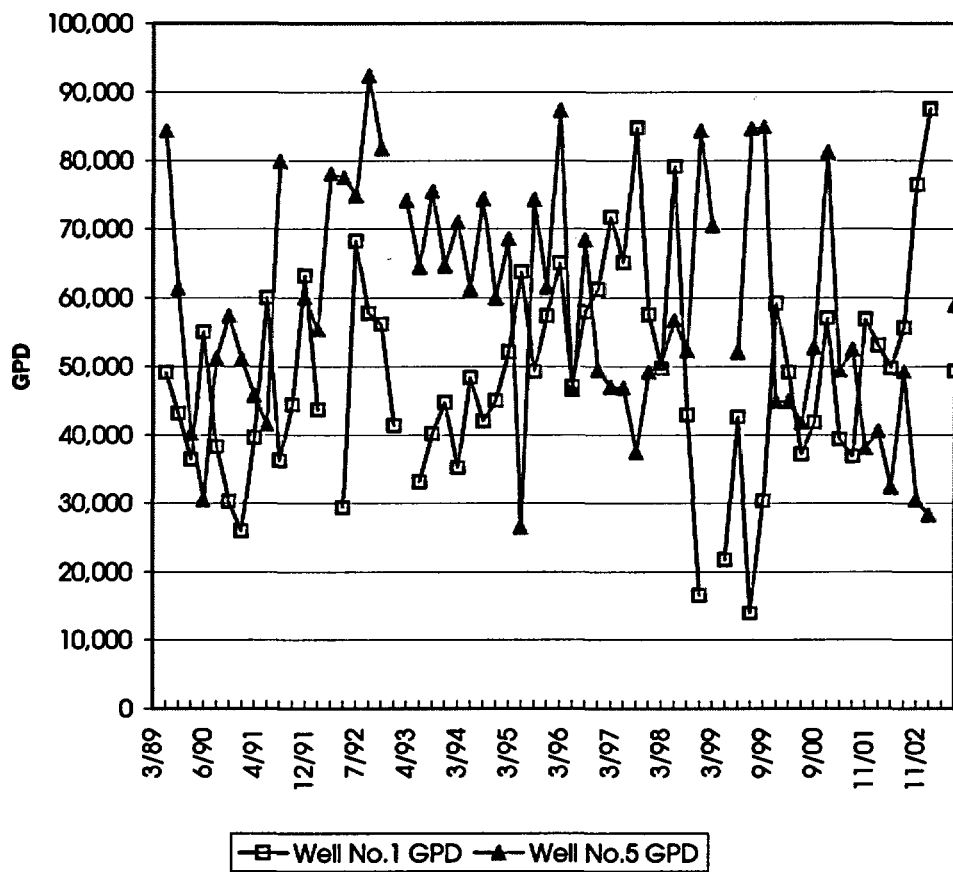
Bill
610.765.5939

<<Groundwater Drawdown.XLS>>

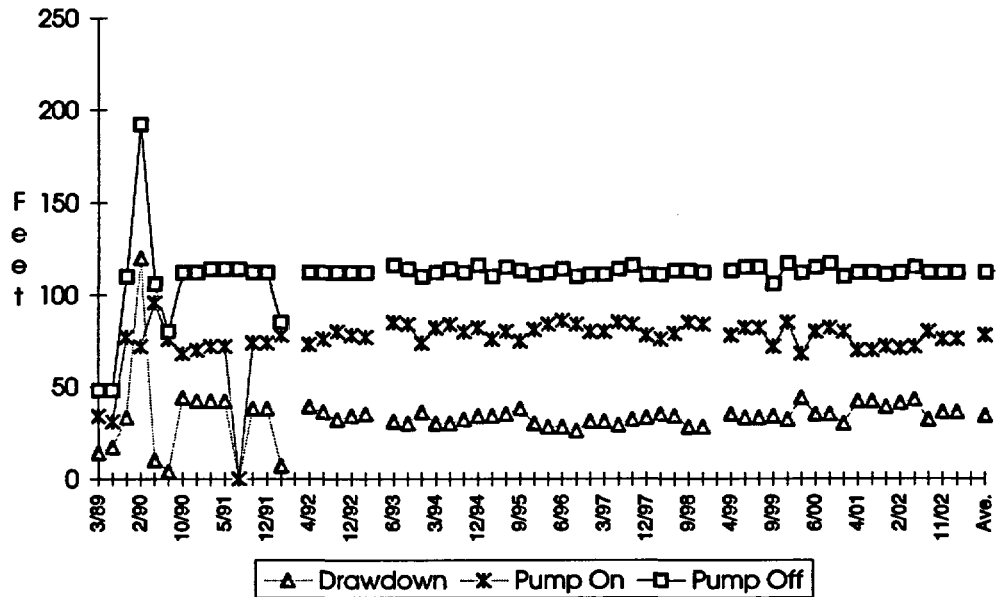
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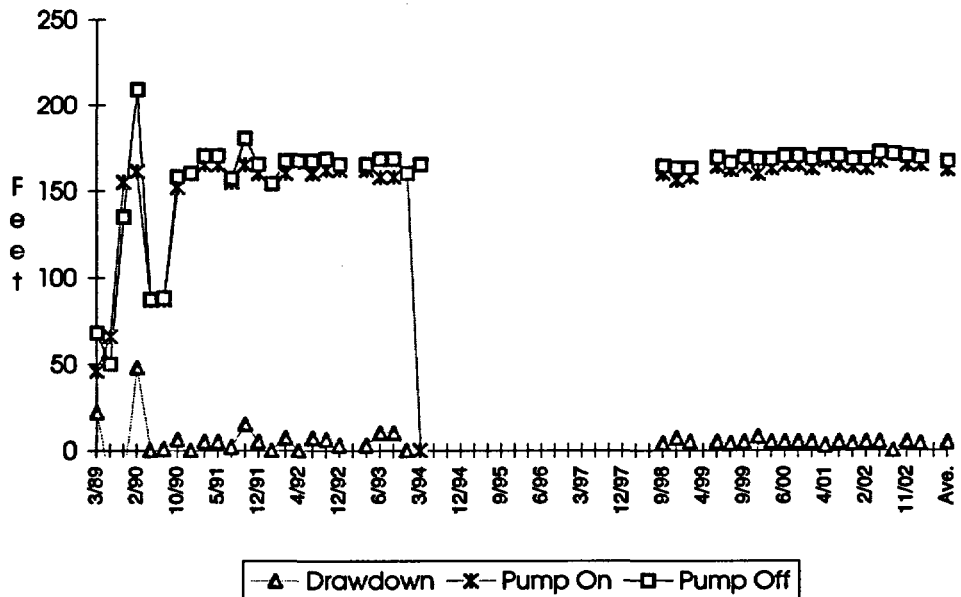
Wells No.1 and No.5 Average Gallons per Day



Well #1 Depth Measurements



Well #5 Depth Measurements



Date	Well No.1						Well No.5					
	Hours	GPD	Pump Off	Static Pumping Level (ft)	Pump On	Drawdown	Hours	GPD	Pump Off	Static Pumping Level (ft)	Pump On	Drawdown
3/89	4009		48	99	34	14	10933.0		68	137	46	22
7/89	4496	49,109	48	99	31	17	11351.0	84,303	50	155	66	-16
10/89	4802	43,200	110	37	77	33	11568.2	61,327	135	70	155	-20
2/90	5154	36,414	192	-45	72	120	11762.3	40,159	209	-4	161	48
6/90	5773	55,022	106	41	96	10	11933.8	30,489	87	118	87	0
7/90	5891	38,270	80	67	76	4	12012.7	51,178	88	117	87	1
10/90	6128	30,255	112	35	68	44	12237.4	57,370	158	47	152	6
1/91	6288	25,946	112	35	70	42	12394.7	51,018	160	45	160	0
4/91	6562	39,614	114	33	72	42	12553.1	45,802	170	35	165	5
5/91	6802	60,000	114	33	72	42	12636.1	41,500	170	35	165	5
7/91	6965	36,222	114	33	130 ??	-167	12815.8	79,867	157	48	155	2
9/91	7239	44,432	112	35	74	38			180	25	165	15
12/91	7718	63,165	112	35	74	38	13228.5	60,029	165	40	160	5
1/92	7769	43,714	85	62	78	7	13260.8	55,371	154	51		
1/92							13293.3	78,000	167	38	160	7
4/92	7982	29,379	112	35	73	39	13542.0	77,517	167	38	167	0
7/92	8522	68,211	112	35	76	36	13838.3	74,855	167	38	160	7
9/92	8917	57,805	112	35	80	32	14153.8	92,341	168	37	162	6
12/92	9301	56,195	112	35	78	34	14433.0	81,717	165	40	162	3
3/93	9570	41,385	112	35	77	35						
4/93							14769.7	74,136	165	40	162	3
6/93	9818	33,067	116	31	85	31	14928.1	64,434	168	37	158	10
9/93	10203	40,174	114	33	84	30	15289.5	75,423	168	37	158	10
12/93	10464	44,743	110	37	74	36	15478.0	64,629	160	45	160	0
3/94	10713	35,153	112	35	82	30	15729.1	70,899	165	40	76??	89?
6/94	11082	48,383	114	33	84	30	15969.0	61,251				
9/94	11463	42,000	112	35	80	32	16297.2	74,309				
12/94	11737	45,041	116	31	82	34	16479.6	59,967				
3/95	12171	52,080	110	37	76	34	16765.1	68,520				
6/95	12685	63,742	115	32	80	35	16867.8	26,503				
9/95	13022	49,241	113	34	75	38	17136.9	74,234				
12/95	13505	57,386	111	36	81	30	17395.8	61,521				
3/96	13906	65,027	112	35	84	28	17665.0	87,308				
6/96	14274	46,979	114	33	86	28	17847.7	46,847				
9/96	14709	58,000	110	37	84	26	18104.0	63,347				
12/96	15260	61,222	111	36	80	31	18326.5	49,444				
3/97	15732	71,696	111	36	80	31	18481.1	46,967				
6/97	16280	65,109	114	33	85	29	18678.3	46,859				
9/97	16937	84,774	116	31	84	32	18823.4	37,445				
12/97	17297	57,600	111	36	78	33	18977.0	49,152				
3/98	17674	49,714	111	36	76	35	19168.0	50,374				
6/98	18274	79,121	113	34	79	34	19383.1	56,730				
9/98	18607	42,968	113	34	85	28	19585.8	52,310	164	41	160	4
12/98	18732	16,667	112	35	84	28	19902.0	84,320	163	42	158	7
3/99	OOS			147			20230.5	70,393	163	42	158	5
4/99	18975	21,761	113	34	78	35						
6/99	19174	42,643	115	32	82	33	20399.8	52,092	169	36	164	5
9/99	19188	14,000	115	32	82	33	20442.1	84,600	166	39	162	4
9/99	19418	30,330	106	41	72	34	20764.0	84,897	169	36	164	5
12/99	19773	59,167	117	30	85	32	20898.7	44,900	168	37	160	8
3/00	20150	49,174	112	35	68	44	21071.0	44,948	168	37	163	5
6/00	20435	37,174	115	32	80	35	21231.0	41,739	170	35	165	5
9/00	20773	41,814	117	30	82	35	21444.0	52,701	170	35	165	5
1/01	21434	57,065	110	37	80	30	21914.0	81,151	168	37	163	5
4/01	21713	39,388	112	35	70	42	22069.0	49,412	170	35	167	3
7/01	22014	36,857	112	35	70	42	22303.0	52,408	170	35	165	5
11/01	22550	56,920	111	36	72	39	22482.0	38,018	168	37	164	4
2/02	22939	53,045	112	35	71	41	22630.4	40,473	168	37	163	5
5/02	23329	49,787	115	32	72	43	22757.0	32,323	172	33	167	5
8/02	23686	55,636	112	35	80	32	22915.0	49,247	171	34	171	0
11/02	24323	76,440	112	35	76	36	23042.0	30,480	170	35	165	5
3/03	25147	87,504	112	35	76	36	23175.0	28,248	169	36	165	4
Ave.		49338	112	37	78	34		58965	167	38	162	5

Averages calculated from the period 10/90 - present with 7/91 & 3/94 data being discarded.

Well #	Depth (ft)	Air line length (ft)
1	250	147'
2	255	
3	1800	
4	1796	
5	264	205'
Big Fish	175	
Fire Prot	225	