

Twp	Rge	Sec	NE				NW				SW				SE				
			<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>NE</u>	<u>NW</u>	<u>SW</u>	<u>SE</u>	<u>Totals</u>
02N	18E	9													X				X

Method of Determination: Place of use determined visually on-site and using 2013 aerial photography to verify the place of use is located as recorded. See attached map.

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
- ☒ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☒ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☒ Photo of Diversion and System Attached

4.

<u>Well or Diversion ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge Size</u>
D0057491		25			
D0057492		25			

D. FLOW MEASUREMENTS

1.

<u>Measurement Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
Flow Meter	Sonic	Fuji	Portaflow	7K0085TB		March 2014

2. Measurements: Meter was calibrated on 2-8-2013 by Cindy Yenter and was determined to be within an acceptable range of accuracy (see attached Water Measuring Device Calibration). Since the device tested within range, flow rate was determined by observing flow rate in gallons per minute on meter display (see attached photos).

E. FLOW CALCULATIONS

____ Additional Computation Sheets Attached

Measured Method:

Theoretical Yield:

$$Q = \frac{8.8 \times (Hp) \times (Eff)}{H}$$

Where: Hp = 50 Hp

Eff = efficiency = 70% assumed

H = total head = pumping level = (2.31 x system pressure)

assume pumping level of 50.5 feet (averaged based on Well Drillers Reports)

assume system pressure = 40 psi

H = 50.5 + (40 x 2.31) = 142.9

$$Q = \frac{8.8 \times 50 \times .70}{142.9} = 2.16 \text{ cfs}$$

F. VOLUME CALCULATIONS**1. Volume Calculations for Other Uses:**

Heating/Cooling: The system is maintained and operated year round. According to totalizer data collected from the flow meter, **309 AF** of water was pumped through the system and reinjected into the aquifer from 9/13/2013 to 9/3/2014. Climate data provided by Weather Underground reports Heating Degree Days (HDD) at 7263 in Hailey from 9/3/2013 to 5/30/2014 and totalizer data indicates 264 AF of water was used during this same period. Cooling Degree Days (CDD) were reported at 245 in Hailey from 6/2/2014 to 9/3/2014 and 45 AF of water was utilized during this same period (<http://www.wunderground.com/history>). According to the Western Regional Climate Center The maximum HDD reported for Hailey is 9153.52 HDD and maximum CDD is 407.50 (<http://www.wrcc.dri.edu/summary/Climsmsid.html>).

Since Bellevue is a mountain town with cooler temperatures, I'm considering the main school year as the heating season, 9/1 to 5/31, and 6/1 to 8/31 as the cooling season. Looking at the reported volume, I found that cooling season volume averaged 0.50 AF daily, while the heating season averaged 0.97 AF a day. If I divide the total acre feet reported by HDD and CDD for the same period, this theoretically represents the amount of water used per Heating Degree Day and Cooling Degree Day. Then if I multiply the result by the maximum Heating Degree Days reported for that area, I should be able to calculate a reasonable volume for licensing that accounts for heating requirements in extremely cold years and cooling in hot years:

$$(264 \text{ AF}/7263 \text{ HDD}) \times 9153.52 \text{ Max HDD} = 332.7 \text{ AF}$$

$$(45 \text{ AF}/265 \text{ CDD}) \times 407.50 \text{ Max CDD} = \underline{69.2 \text{ AF}}$$

$$\text{Total } 401.9 \text{ AF}$$

G. NARRATIVE/REMARKS/COMMENTS

Application for permit 37-22514 was submitted by the Blaine County School District #61 on 4/30/2010, and proof of beneficial use and evidence of development (permit had lapsed) submitted 9/16/2013. Permit was reinstated by order on 9/19/2013 with the priority date advanced to 5/14/2010.

The developed system is an open-loop heat exchange system used to heat and cool the approximately 84,000 ft² elementary school. The system utilizes water from two wells, each equipped with a 25 Hp pump. Flow into the building is measured using a Veris Verabar V500 vortex flow meter combined with a Foxboro. The water passes through a heat exchanger and is then passed back out to an injection well where it is returned to the aquifer.

On 9/4/2014, I visited the school to obtain a flow rate for this field exam. The meter had been calibrated in 2013 by Cindy Yenter and was found to be within an acceptable -4.57% range of accuracy when compared with the flow rates measured using a Fuji Portaflow ultrasonic meter. The maintenance staff ran the well pump at full capacity and I monitored the flow rate on the Foxboro display, and 775 gallons per minute was the maximum sustained flow rate achieved (See attached photo). This rate is equivalent to 1.73 cfs and is less than the permitted 3.0 cfs. When the permit was filed, the intention was to develop three wells equipped with 25 Hp pumps, but due to budget limitations, the system was constructed with two production wells. This non-consumptive system is considered an open-loop system because well water is used as the heat exchange fluid and is passed through the system and then out to an injection well where it is returned to the aquifer.

The actual volume recommended for licensing is based on reported volumes and have been adjusted for potential water use during an extremely hot and/or cold year. The calculations used to adjust the volume were derived from a method suggested by Michele Edl, Staff Engineer at the State Office, in a memo that is attached to this field exam.

Recommend licensing a 1.73 cfs flow rate; a cooling volume of 69.2 AF; a heating volume of 332.7 AF, with a combined volume of 401.9 AF.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS**1. Recommended Amounts**

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
HEATING	01/01 to 12/31	1.730 CFS	332.7 AF
COOLING	01/01 to 12/31	1.730 CFS	69.2 AF
<u>Totals:</u>		1.730 CFS	401.9 AF

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None

☒ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name

Date

9-26-2014

Reviewer

Date

9/29/14

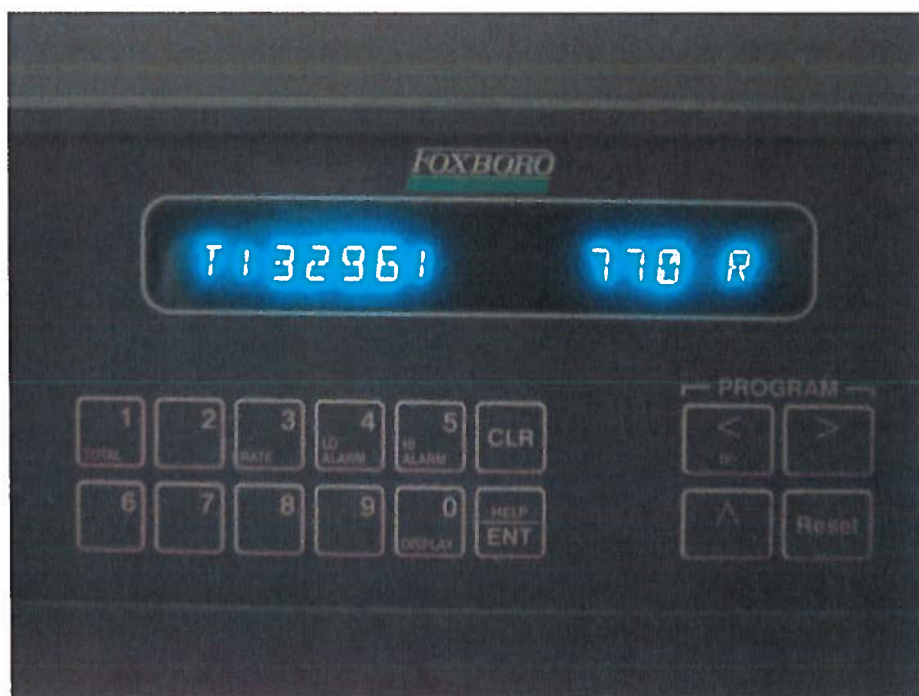


Figure 1: Foxboro Totalizer

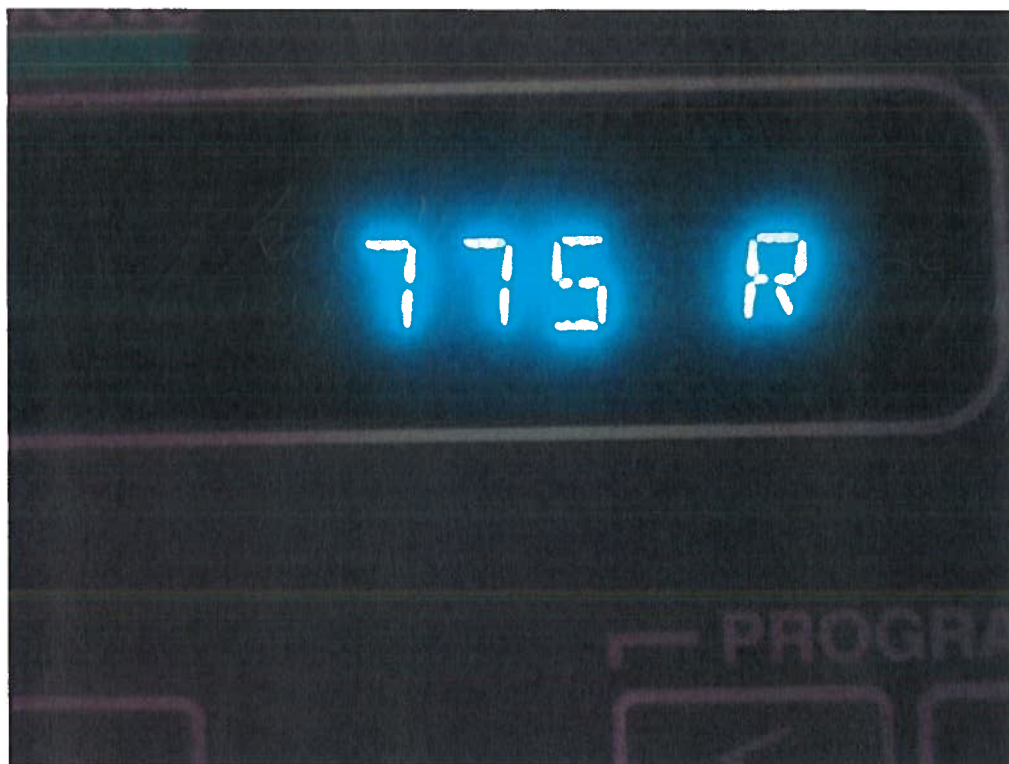


Figure 2: Maximum Sustained Flow Rate



Figure 3: Production Well #1



Figure 4: Production Well #2



Figure 5: Injection Well



Figure 6: Variable Frequency Drives

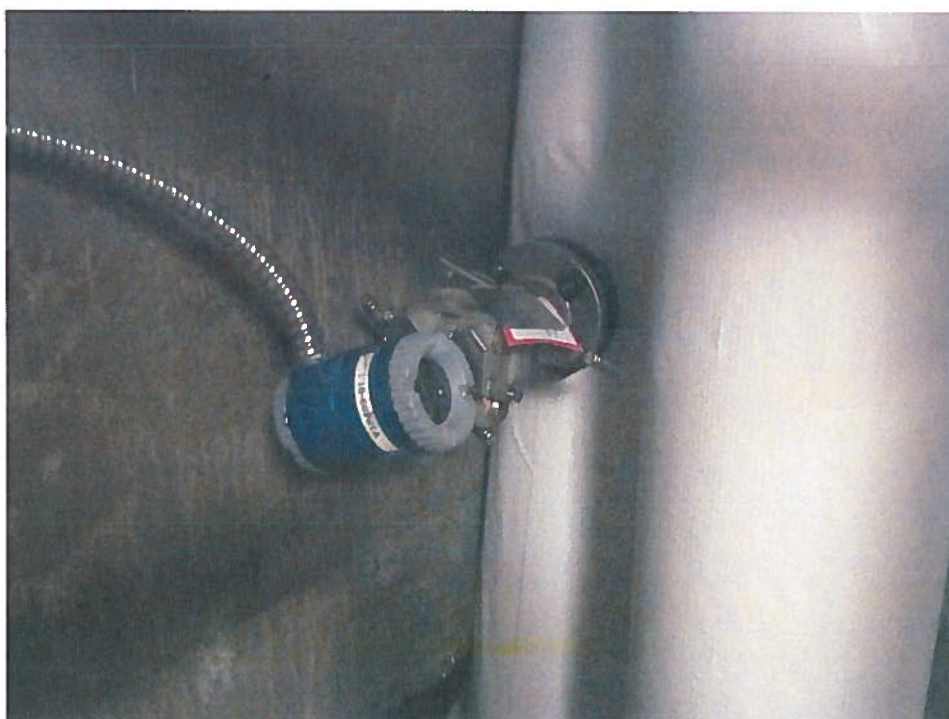


Figure 7: Varis Verabar V500 Vortex Flowmeter

System Diagram



Healey Elementary

309 AF over 355 days

Blaine County School District Heating/Cooling System Water Production

Date	Time	Date & Time	Totalizer Reading (gals)	Observed Flow (gpm)	Difference (gals)	Elapsed minutes	Est. Daily Volume for Reading Interval (thousands of gals)	Est Avg Daily Flow (gpm)	Comments
9/13/2013	2:00 PM	9/13/13 2:00 PM	31,951,000	0					
9/20/2013	1:00 PM	9/20/13 1:00 PM	32,790,000	0	839,000	10,020	121	84	
9/26/2013	11:00 AM	9/26/13 11:00 AM	33,731,000	0	941,000	8,520	159	110	
10/3/2013	11:00 AM	10/3/13 11:00 AM	35,079,000	0	1,348,000	10,080	193	134	
10/11/2013	12:00 PM	10/11/13 12:00 PM	36,489,000	0	1,410,000	11,580	175	122	
10/17/2013	11:00 AM	10/17/13 11:00 AM	38,525,000	0	2,036,000	8,580	342	237	
10/23/2013	11:00 AM	10/23/13 11:00 AM	40,169,000	0	1,644,000	8,640	274	190	
10/30/2013	2:00 PM	10/30/13 2:00 PM	41,560,000	0	1,391,000	10,260	195	136	
11/6/2013	11:00 AM	11/6/13 11:00 AM	44,060,000	0	2,500,000	9,900	364	253	
11/13/2013	11:00 AM	11/13/13 11:00 AM	45,712,000	0	1,652,000	10,080	236	164	
11/20/2013	8:00 AM	11/20/13 8:00 AM	48,081,000	0	2,369,000	9,900	345	239	
11/27/2013	8:00 AM	11/27/13 8:00 AM	50,728,000	0	2,647,000	10,080	378	263	
12/4/2013	9:00 AM	12/4/13 9:00 AM	53,356,000	0	2,628,000	10,140	373	259	
12/11/2013	9:00 AM	12/11/13 9:00 AM	58,654,000	0	5,298,000	10,080	757	526	
12/18/2013	11:00 AM	12/18/13 11:00 AM	61,835,000	0	3,181,000	10,200	449	312	
12/26/2013	8:00 AM	12/26/13 8:00 AM	65,364,000	0	3,529,000	11,340	448	311	
12/27/2013	8:00 AM	12/27/13 8:00 AM	65,782,000	0	418,000	1,440	418	290	
12/30/2013	4:56 AM	12/30/13 4:56 AM	67,032,000	0	1,250,000	4,136	435	302	
1/2/2014	4:49 AM	1/2/14 4:49 AM	68,302,000	0	1,270,000	4,313	424	294	
1/3/2014	4:49 AM	1/3/14 4:49 AM	68,696,000	0	394,000	1,440	394	274	
1/6/2014	5:14 AM	1/6/14 5:14 AM	70,006,000	0	1,310,000	4,345	434	301	
1/7/2014	4:48 AM	1/7/14 4:48 AM	70,582,000	0	576,000	1,414	587	407	
1/8/2014	4:44 AM	1/8/14 4:44 AM	71,052,000	0	470,000	1,436	471	327	
1/9/2014	4:48 AM	1/9/14 4:48 AM	71,496,000	598	444,000	1,444	443	307	Well pump 1 and 2 running at 85%
1/10/2014	4:50 AM	1/10/14 4:50 AM	71,914,000	0	418,000	1,442	417	290	
1/13/2014	4:48 AM	1/13/14 4:48 AM	73,111,000	256	1,197,000	4,318	399	277	
1/14/2014	4:57 AM	1/14/14 4:57 AM	73,573,000	731	462,000	1,449	459	319	Well pump 1 and 2 running at 100%
1/15/2014	4:49 AM	1/15/14 4:49 AM	74,023,000	646	450,000	1,432	453	314	Well pump1 and 2 running at 89%
1/16/2014	4:47 AM	1/16/14 4:47 AM	74,501,000	574	478,000	1,438	479	332	Well pump1 and 2 running at 80%
1/17/2014	4:46 AM	1/17/14 4:46 AM	74,940,000	696	439,000	1,439	439	305	Well pump1 and 2 running at 96%
1/21/2014	4:45 AM	1/21/14 4:45 AM	76,578,000	695	1,638,000	5,759	410	284	Well pump1 and 2 running at 96%
1/22/2014	4:45 AM	1/22/14 4:45 AM	77,046,000	735	468,000	1,440	468	325	
1/23/2014	4:44 AM	1/23/14 4:44 AM	77,510,000	683	464,000	1,439	464	322	
1/24/2014	4:40 AM	1/24/14 4:40 AM	77,982,000	674	472,000	1,440	472	328	
1/27/2014	4:40 AM	1/27/14 4:40 AM	79,286,000	669	1,304,000	4,316	435	302	
1/28/2014	4:46 AM	1/28/14 4:46 AM	79,801,000	725	515,000	1,446	513	356	Well pump 1 and 2 at 100 %
1/29/2014	4:43 AM	1/29/14 4:43 AM	80,312,000	328	511,000	1,437	512	356	

1/30/2014	4:45 AM	1/30/14 4:45 AM	80,723,000	241	411,000	1,442	410	285	
1/31/2014	5:30 AM	1/31/14 5:30 AM	81,148,000	734	425,000	1,485	412	286	Well pump 1 and 2 at 100 %
2/3/2014	5:36 AM	2/3/14 5:36 AM	82,514,000	639	1,366,000	4,326	455	316	Well pump 1 and 2 at 86 %
2/4/2014	4:46 AM	2/4/14 4:46 AM	83,057,000	726	543,000	1,390	563	391	Well pump 1 and 2 at 100 %
2/5/2014	4:52 AM	2/5/14 4:52 AM	83,727,000	731	670,000	1,446	667	463	Well pump 1 and 2 at 100 %
2/6/2014	4:48 AM	2/6/14 4:48 AM	84,405,000	730	678,000	1,436	680	472	Well pump 1 and 2 at 100 %
2/7/2014	4:33 AM	2/7/14 4:33 AM	85,057,000	730	652,000	1,425	659	458	Well pump 1 and 2 at 100 %
2/10/2014	4:47 AM	2/10/14 4:47 AM	86,399,000	596	1,342,000	4,334	446	310	
2/11/2014	4:44 AM	2/11/14 4:44 AM	86,775,000	638	376,000	1,437	377	262	
2/12/2014	4:42 AM	2/12/14 4:42 AM	87,184,000	566	409,000	1,438	410	284	
2/13/2014	4:45 AM	2/13/14 4:45 AM	87,568,000	365	384,000	1,443	383	266	
2/14/2014	4:52 AM	2/14/14 4:52 AM	87,926,000	364	358,000	1,447	356	247	
2/18/2014	4:49 AM	2/18/14 4:49 AM	89,497,000	649	1,571,000	5,757	393	273	Well Pump 1 and 2 at 96 %
2/19/2014	4:42 AM	2/19/14 4:42 AM	89,875,000	304	378,000	1,433	380	264	
2/20/2014	4:48 AM	2/20/14 4:48 AM	90,259,000	726	384,000	1,446	382	266	
2/21/2014	4:47 AM	2/21/14 4:47 AM	90,707,000	715	90	1,439	0	0	Well Pump 1 and 2 at 96 %
2/24/2014	4:40 AM	2/24/14 4:40 AM	91,881,000	363	1,174,000	4,313	392	272	
2/25/2014	4:39 AM	2/25/14 4:39 AM	92,227,000	373	346,000	1,439	346	240	
2/26/2014	4:47 AM	2/26/14 4:47 AM	92,565,000	302	338,000	1,448	336	233	
2/27/2014	4:48 AM	2/27/14 4:48 AM	92,877,000	309	312,000	1,441	312	217	1 well pump running.
2/28/2014	4:45 AM	2/28/14 4:45 AM	93,237,000	715	360,000	1,437	361	251	Well Pumps 1 and 2 Running.
3/3/2014	4:54 AM	3/3/14 4:54 AM	94,363,000	348	1,126,000	4,329	375	260	1 well pump running.
3/4/2014	4:48 AM	3/4/14 4:48 AM	94,735,000	656	372,000	1,434	374	259	Well Pumps 1 and 2 Running.
3/5/2014	4:43 AM	3/5/14 4:43 AM	95,100,000	200	365,000	1,435	366	254	1 well pump running.
3/6/2014	4:43 AM	3/6/14 4:43 AM	95,434,000	730	334,000	1,440	334	232	Well Pumps 1 and 2 Running.
3/7/2014	4:42 AM	3/7/14 4:42 AM	95,772,000	635	338,000	1,439	338	235	Well Pumps 1 and 2 Running.
3/10/2014	4:48 AM	3/10/14 4:48 AM	96,883,000	626	1,111,000	4,326	370	257	Well Pumps 1 and 2 Running.
3/11/2014	4:49 AM	3/11/14 4:49 AM	97,225,000	629	342,000	1,441	342	237	Well Pumps 1 and 2 Running.
3/12/2014	4:49 AM	3/12/14 4:49 AM	97,615,000	688	390,000	1,440	390	271	Well Pumps 1 and 2 Running.
3/13/2014	4:39 AM	3/13/14 4:39 AM	98,022,000	649	407,000	1,430	410	285	Well Pumps 1 and 2 Running.
3/14/2014	4:39 AM	3/14/14 4:39 AM	98,377,000	752	355,000	1,440	355	247	Well Pumps 1 and 2 Running.
3/17/2014	4:43 AM	3/17/14 4:43 AM	99,377,000	209	1,000,000	4,324	333	231	1 Well pump running.
3/18/2014	4:44 AM	3/18/14 4:44 AM	99,670,000	307	293,000	1,441	293	203	1 Well pump running.
3/19/2014	4:29 AM	3/19/14 4:29 AM	100,057,000	664	387,000	1,425	391	272	Well Pumps 1 and 2 Running.
3/20/2014	4:14 AM	3/20/14 4:14 AM	100,457,000	560	400,000	1,425	404	281	Well Pumps 1 and 2 Running.
3/21/2014	4:41 AM	3/21/14 4:41 AM	100,809,000	293	352,000	1,467	346	240	1 Well pump running.
3/31/2014	4:58 AM	3/31/14 4:58 AM	104,396,000	658	3,587,000	14,417	358	249	Well Pumps 1 and 2 Running.
4/1/2014	5:42 AM	4/1/14 5:42 AM	104,806,000	704	410,000	1,484	398	276	Well Pumps 1 and 2 Running.
4/2/2014	5:42 AM	4/2/14 5:42 AM	105,219,000	287	413,000	1,440	413	287	1 Well pump running.
4/3/2014	8:43 AM	4/3/14 8:43 AM	105,626,000	238	407,000	1,621	362	251	1 Well pump running.
4/4/2014	1:01 PM	4/4/14 1:01 PM	106,008,000	283	382,000	1,698	324	225	1 Well pump running.
4/7/2014	1:27 PM	4/7/14 1:27 PM	106,920,000	175	912,000	4,346	302	210	1 Well pump running.
4/8/2014	7:53 AM	4/8/14 7:53 AM	107,237,000	365	317,000	1,106	413	287	1 Well pump running.
4/9/2014	7:53 AM	4/9/14 7:53 AM	107,488,000	366	251,000	1,440	251	174	1 Well pump running.

4/10/2014	9:24 AM	4/10/14 9:24 AM	107,708,000	0	220,000	1,531	207	144	1 Well pump running
4/11/2014	10:07 AM	4/11/14 10:07 AM	107,935,000	224	227,000	1,483	220	153	1 Well pump running
4/14/2014	7:54 AM	4/14/14 7:54 AM	108,537,000	584	602,000	4,187	207	144	Well Pumps 1 and 2 Running.
4/15/2014	4:59 AM	4/15/14 4:59 AM	108,875,000	0	338,000	1,265	385	267	
4/16/2014	4:57 AM	4/16/14 4:57 AM	109,151,000	315	276,000	1,438	276	192	1 Well pump running
4/17/2014	7:25 AM	4/17/14 7:25 AM	109,425,000	315	274,000	1,588	248	173	1 Well pump running
4/18/2014	4:41 AM	4/18/14 4:41 AM	109,682,000	249	257,000	1,276	290	201	1 Well pump running
4/21/2014	8:18 AM	4/21/14 8:18 AM	110,210,000	205	528,000	4,537	168	116	1 Well pump running.
4/22/2014	5:39 AM	4/22/14 5:39 AM	110,466,000	236	256,000	1,281	288	200	1 Well pump running.
4/24/2014	7:20 AM	4/24/14 7:20 AM	110,910,000	246	444,000	2,981	214	149	1 Well pump running.
4/25/2014	5:41 AM	4/25/14 5:41 AM	111,157,000	594	247,000	1,341	265	184	Well Pumps 1 and 2 Running.
4/28/2014	7:25 AM	4/28/14 7:25 AM	111,868,000	338	711,000	4,424	231	161	1 Well pump running.
4/29/2014	9:41 AM	4/29/14 9:41 AM	112,183,000	312	315,000	1,576	288	200	1 Well pump running.
5/1/2014	8:50 AM	5/1/14 8:50 AM	112,689,000	253	506,000	2,829	258	179	1 Well pump running.
5/2/2014	7:30 AM	5/2/14 7:30 AM	112,886,000	0	197,000	1,360	209	145	
5/5/2014	8:48 AM	5/5/14 8:48 AM	113,345,000	0	459,000	4,398	150	104	
5/6/2014	4:30 AM	5/6/14 4:30 AM	113,542,000	0	197,000	1,182	240	167	
5/7/2014	4:40 AM	5/7/14 4:40 AM	113,748,000	248	206,000	1,450	205	142	1 Well pump running.
5/8/2014	4:30 AM	5/8/14 4:30 AM	113,975,000	0	227,000	1,430	229	159	
5/9/2014	4:30 AM	5/9/14 4:30 AM	114,210,000	343	235,000	1,440	235	163	1 Well pump running.
5/12/2014	4:28 AM	5/12/14 4:28 AM	114,811,000	313	601,000	4,318	200	139	1 Well pump running.
5/13/2014	4:30 AM	5/13/14 4:30 AM	115,081,000	343	270,000	1,442	270	187	1 Well pump running.
5/14/2014	4:43 AM	5/14/14 4:43 AM	115,315,000	343	234,000	1,453	232	161	1 Well pump running.
5/15/2014	4:43 AM	5/15/14 4:43 AM	115,510,000	343	195,000	1,440	195	135	1 Well pump running.
5/16/2014	7:46 AM	5/16/14 7:46 AM	115,681,000	0	171,000	1,623	152	105	
5/19/2014	7:40 AM	5/19/14 7:40 AM	116,116,000	0	435,000	4,314	145	101	
5/20/2014	7:00 AM	5/20/14 7:00 AM	116,319,000	0	203,000	1,400	209	145	
5/21/2014	7:00 AM	5/21/14 7:00 AM	116,513,000	343	194,000	1,440	194	135	1 Well pump running.
5/27/2014	7:00 AM	5/27/14 7:00 AM	117,509,000	0	996,000	8,640	166	115	
5/28/2014	7:00 AM	5/28/14 7:00 AM	117,660,000	0	151,000	1,440	151	105	
5/29/2014	7:00 AM	5/29/14 7:00 AM	117,809,000	0	149,000	1,440	149	103	
5/30/2014	7:00 AM	5/30/14 7:00 AM	117,954,000	230	145,000	1,440	145	101	1 Well pump running.
6/2/2014	8:00 AM	6/2/14 8:00 AM	118,390,000	0	436,000	4,380	143	100	
6/3/2014	7:30 AM	6/3/14 7:30 AM	118,542,000	342	152,000	1,410	155	108	1 Well pump running.
6/6/2014	9:00 AM	6/6/14 9:00 AM	118,987,000	0	445,000	4,410	145	101	
7/31/2014	9:00 AM	7/31/14 9:00 AM	127,479,000	0	8,492,000	79,200	154	107	
8/1/2014	9:00 AM	8/1/14 9:00 AM	127,646,000	0	167,000	1,440	167	116	
8/4/2014	9:17 AM	8/4/14 9:17 AM	128,109,000	0	463,000	4,337	154	107	
8/5/2014	11:34 AM	8/5/14 11:34 AM	128,258,000	0	149,000	1,577	136	94	
8/6/2014	7:33 AM	8/6/14 7:33 AM	128,411,000	0	153,000	1,199	184	128	
8/7/2014	10:32 AM	8/7/14 10:32 AM	128,596,000	0	185,000	1,619	165	114	
8/8/2014	12:50 PM	8/8/14 12:50 PM	128,769,000	0	173,000	1,578	158	110	
8/11/2014	3:50 PM	8/11/14 3:50 PM	129,241,000	0	472,000	4,500	151	105	
8/12/2014	3:37 PM	8/12/14 3:37 PM	129,393,000	0	152,000	1,427	153	107	

[illegible]

IDAHO DEPARTMENT OF WATER RESOURCES
Water Measurement Program

WATER MEASURING DEVICE CERTIFICATION

(Revised 7/2002)

District <u>UWP</u>	
Diversion Name <u>Harley Elementary</u>	
Inventory Date _____	Test Date <u>2.8.2013</u>
Inventory Examiner _____	Person performing test <u>cy/RS</u>
PCC o.k.? ☐ Yes ☐ No	Exam complete? ☒ Yes ☐ No

Name:	<u>Blaine School Dist.</u>
Water Right No.:	_____
Legal Description:	T _____ R _____ Sec. _____ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$
Site Tag No.:	_____
Diversion Name:	_____
<u>WMIS 1001304-05-06</u>	

Current Owner

Name _____ Phone _____

Address _____ Cell _____

City _____ St _____ Zip _____ E-mail _____

Operator (if leased or operated by person other than owner)

Name _____ Phone _____

Address _____ Cell _____

City _____ St _____ Zip _____ E-mail _____

SECTION 1 – Well Site Identification

Global Positioning System Data:

Data Collection Filename _____ Offset _____

IDWR Site Tag Identification No. _____

Site Tag Location description: _____

PLS/USGS LOCATOR _____

For Department/District Use Only

Received by _____ Date _____

Reviewed by _____ Date _____

Data Entry By _____ Date _____

SECTION II – Installed Meter Information

METER AND MOUNTING PIPE INFORMATION			
Motor HP	25	Volume units	Acre-Feet <u>Gallons</u> Other (specify) _____
Meter Install Date	~~2-2008~~ *2.1.13	Volume multiplier	1000
Manufacturer	Vers Verabar (Forbush Totalizer)	Installation location	☐ Excel ☐ Fair ☒ Good ☐ Poor
Meter Type	Vortex	Pipe material	STEEL
Meter Model	V-500	Outside diameter	6.64" ^m
Serial Number	V18499-01.1	Wall thickness	.25
Size (nominal)	6	Inside diameter	Installed
Measure Flow Rate?	☒ Yes ☐ No	Amount of straight pipe upstream from meter	<u>24</u> Inches Pipe Lengths
Measurement Units	☐ CFS ☒ GPM Other (specify) _____	Amount of straight pipe downstream from meter	<u>36</u> Inches Pipe Lengths
Flow Rate Multiplier	1	Standard Meter Type	☒ Sonic ☐ Pyg ☐ Collins ☐ Hall ☐ Anub ☐ Dye/chem ☐ Other <u>VERABAR</u>
Measure Cumulative Volume?	☒ Yes ☐ No	Standard Meter Confidence	☐ Excellent 2% ☒ Good 5% ☐ Fair 10% ☐ Poor > 10%

STD
48

12

TRANS
SPAC9.

4.95 FL 12

Multiple FlowmetersAre multiple flowmeters used to measure diversions from this well? ☐ Yes ☐ No

If yes, how many? _____

(Attach separate form for each meter checked and/or calibrated.)

Multiple Wells

If this meter measures diversions from multiple wells, list names and locations of other wells:

meter installed 9-2012, totalizer installed ~2.1.2013

SECTION III – Certification for Calibration of a Water Measurement Meter

Measurement No. 1 (M_1) is the measured rate of flow from the permanently installed flow meter.

Measurement No. 2 (M_2) is the measured rate of flow from the measuring device being used to check the flow for the calibration. This method or device must be accurate to within $\pm 5\%$ error. Describe below the method and equipment used to perform this measurement.

$$\text{Percent Difference} = (M_1 - M_2) \div M_2 \times 100 = \pm \% \quad (\text{Acceptable is within } \pm 10\%) \quad (\text{equation 1})$$

$$\text{Calibration Multiplier} = M_2 \div M_1 \quad (\text{equation 2})$$

Is flowmeter installed according to manufacturer's specifications? ☐ Yes ☐ No ☐ Unsure

Describe any apparent problems with installation or operation _____

Flowmeter accuracy prior to any adjustments: _____ Totalizer reading _____

Flowmeter accuracy after final adjustment: _____ Totalizer reading _____

Flowmeter calibration multiplier: _____

FLOWMETER ACCURACY CALIBRATION TABLE							
Installed meter (totalizer reading)	Time	Total Gallons	Average Flow Rate GPM (M_1)	Standard total gallons	Average Flow Rate GPM (M_2)	% diff. ($\pm$)	Comments and adjustments
6694390	12:55						
6698227	13:05	3837	383.7	402.1	402.1	-4.57	
	10						

Notes – Comments – Calculations: Speed 4737 Water temp 48° F (50° = 474

WATER LEVEL DATA	
Does the well have access to measure water levels? ~ Yes ~ No (<i>check one</i>)	
Is this well part of USGS, IDWR, or another network of water level monitoring wells? ~ Yes ~ No (<i>check one</i>)	
Static Water Level _____ ft Date _____	Pumping Water Level _____ ft (at condition _____) Date _____

Sketch and/or photograph of installation:

I certify that the above information is true and correct to the best of my knowledge and ability and the measurements taken and recorded are in accordance with the standards and specifications of the equipment used.

Signature _____ Date _____
(person performing measurements)

Hailey Elementary H/C, Blaine School District

LOG NAME:HAILEY

START :02-08 12:55

END :02-08 13:05

INTERVAL:00:00:01

2/8/2013 12:55
+4.320E+0 ft/s
+3.987E+2 gal/m
+TOTAL 0000000 gal
NORMAL

2/8/2013 13:01
+4.349E+0 ft/s
+4.013E+2 gal/m
+TOTAL 0002412 gal
NORMAL

2/8/2013 12:56
+4.249E+0 ft/s
+3.921E+2 gal/m
+TOTAL 0000388 gal
NORMAL

2/8/2013 13:02
+4.329E+0 ft/s
+3.995E+2 gal/m
+TOTAL 0002813 gal
NORMAL

2/8/2013 12:57
+4.331E+0 ft/s
+3.997E+2 gal/m
+TOTAL 0000788 gal
NORMAL

2/8/2013 13:03
+4.315E+0 ft/s
+3.982E+2 gal/m
+TOTAL 0003211 gal
NORMAL

2/8/2013 12:58
+4.391E+0 ft/s
+4.052E+2 gal/m
+TOTAL 0001192 gal
NORMAL

2/8/2013 13:04
+4.279E+0 ft/s
+3.949E+2 gal/m
+TOTAL 0003610 gal
NORMAL

2/8/2013 12:59
+4.413E+0 ft/s
+4.073E+2 gal/m
+TOTAL 0001599 gal
NORMAL

2/8/2013 13:05
+4.285E+0 ft/s
+3.954E+2 gal/m
+TOTAL 0004008 gal
NORMAL

2/8/2013 13:00
+4.345E+0 ft/s
+4.010E+2 gal/m
+TOTAL 0002007 gal
NORMAL

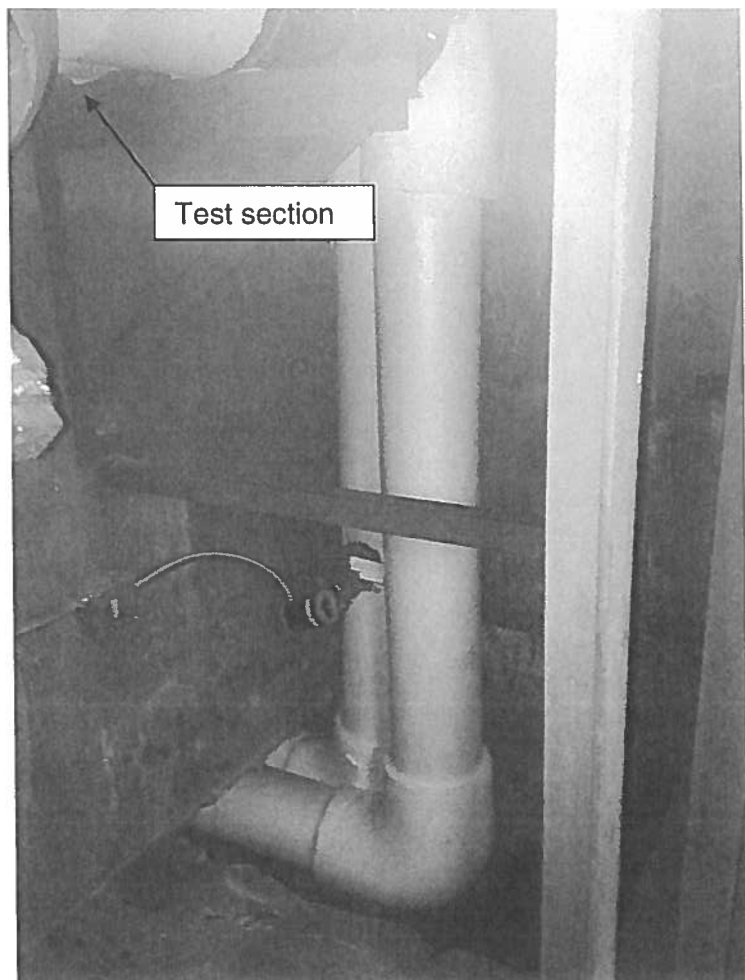
400.8 gpm
0.89 cfs

Wood River HS meter install



Hailey Elementary meter install

Test downstream from meter on horizontal pipe.



TO: Bill Mills

FROM: Michele Edl

REVISED: August 13, 2013

RE: Heating and Cooling Volume

Questions have arisen as to how to calculate a volume for a heating or cooling use. IDWR staff and consultants have attempted to estimate those volumes based on a long-standing method outlined in Admin Memo 23. That method should only be used as a last resort when nothing is known about the equipment or system. It is appropriate when the equipment/system no longer exist and a license volume is necessary. But it is a misapplication of the procedure to use it for existing equipment and systems. There is often a simpler way to calculate the volume from the actual system usage.

In many instances (e.g. in districts requiring totalizers or for large-scale systems, where a well or well pump is dedicated to the heating and cooling system) the estimation exercise should be unnecessary and certainly no better representation than the method I propose.

I am recommending that you use a method which relates the system readings to the HDD and CDD. You need to collect

1. information from the operator's handwritten log books, or the computer controller's system archive, or from the in-line totalizer and
2. the heating and cooling degree days from a weather station nearest to your POU.

System data

I understand that your field exams are for the Jerome School District. I also understand that there are totalizers on the systems but they have been adjusted by the operator. Although a year's worth of data is nice to have, it's not absolutely necessary. 24 hours worth of data may not be enough and data from the heating season can't really be used to represent the cooling season. So, you do need to collect enough data to characterize both heating and cooling use if that is what the permit authorizes. I like to see several days in a row, in the respective season, totalized so that we know that we are seeing a representative response of the building and the occupants to the weather.

DD data

The nearest weather station to your system may be the Jerome airport. I like the information provided by this website <http://www.wrcc.dri.edu/summary/Climsmsid.html> because they do the HDD and CDD calculations for us and they calculate the maximum HDD and CDD. You will find Jerome listed in the left panel.

To compare with this source, you will need a year's worth of system data.

I use a different website to collect HDD and CDD for shorter time periods. It is less official but again, they do the calculations for us. For Jerome I would use

<http://www.wunderground.com/history/airport/KJER/2013/8/13/CustomHistory.html>

The season or part season that we are measuring may not be the worst weather season that the heating or cooling system will see in its lifetime. IDWR has found that it is reasonable to issue a license in excess of the measured amount for these non-consumptive uses, if we can understand what an extreme weather year looks like. For heating and cooling use, the extreme years can be summarized as the maximum HDD and CDD respectively.

The method

Once I have system water use data; the totalizer readings, and the HDD and or CDD data for the **same time period** I make a comparison which calculates a volume.

I compare the system water use data with the DD data and reduce the ratio to cfs-d, gpm or AF per DD. This tells me how much water was used by the system for each DD.

To calculate the heating or cooling volume for licensing, I multiply the AF per DD found above by the maximum HDD or CDD given on WRCC's website.

Worked example

Suppose the heating system for the elementary school in the Jerome School District has a totalizer and from Jan 1 to Feb 1, 2012, the readings show that 200,880 gallons have passed through. In that same 31 days, there were 1066 HDDs. That reduces to 1884 gallons per HDD. For Jerome, the most extreme HDD is 7990 HDD. This system would require 15,053,160 gallons or 46.2 AF for an extreme winter. And this is what I would recommend for the license volume.

A similar calculation could be worked with pump motor hours. The additional assumption is that the pump runs constantly at the rate recommended for license.

Conclusions/recommendations

The system use data tells us all that we need to know. It's not necessary to ask for insulation or square footage. We assume that a building was built to code, but if it hasn't been IDWR cannot correct that. And we can't mandate efficiency. We only recognize beneficial use.

Unfortunately, IDWR doesn't ask that system records be provided with the Proof statement. It's up to the examiner to ask for it. And if the permit holder hasn't kept past system records then you will need to collect them going forward.

Energy efficiencies applied after the Proof will impact how the system responds and may reduce the licensed volume. So if possible, collect and compare data from the development period of the permit rather than from an operation period afterward.