

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 37-22513

Exam Date: 9/4/2014

1. Current Owner: BLAINE COUNTY SCHOOL DISTRICT #61
118 W BULLION ST
HAILEY ID 83333
(208)578-5000
2. Accompanied by: Howard Royal
Phone No: (208) 481-2376
Address: 118 W. Bullion St, Hailey, ID 83333
Relationship to Permit Holder: Blaine County School District Maintenance Supervisor

3. **SOURCE**

GROUND WATER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: None
2. Other water rights with the same point of diversion: None

C. DIVERSION AND DELIVERY SYSTEM1. **LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER

NW1/4NE1/4

Sec. 36, Twp 02N, Rge 18E, B.M.

BLAINE County

Method of Determination: Waypoints were collected with a Garmin GPSmap 60CSx receiver and downloaded into an ArcMap shapefile that corresponds with 2011 and 2013 aerial photography and verified the points of diversion are located as recorded. See attached map.

2.

PLACE OF USE: HEATING

Twp Rge Sec	NE				NW				SW				SE				Totals
02N 18E 36	<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>	
		X															

PLACE OF USE: COOLING

Twp Rge Sec	NE				NW				SW				SE				Totals
02N 18E 36	<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>	
		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>
D0057451		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 9-14-2012 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 photo).

E. FLOW CALCULATIONS

____ Additional Computation Sheets Attached

Measured Method:

Theoretical Yield:

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

Where: Hp = 25 Hp

Eff = efficiency = 70% assumed

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

assume pumping level of 65 feet (based on Well Drillers Report)

assume system pressure = 40 psi

$$H = 65 + (40 \times 2.31) = 157.4$$

$$Q = \frac{8.8 \times 25 \times .70}{157.4} = 0.98 \text{ cfs}$$

F. VOLUME CALCULATIONS

1. Volume Calculations for Other Uses: Heating & Cooling:

Heating/Cooling: The system is maintained and operated year round. According to totalizer data collected from the flow meter, **220 AF** of water was pumped through the system and reinjected into the aquifer from 9/4/2013 to 9/4/2014. Climate data provided by Weather Underground reports Heating Degree Days (HDD) at 7588 and Cooling Degree Days (CDD) at 279 in Hailey from 9/4/2013 to 9/4/2014 (<http://www.wunderground.com/history>). According to the Western Regional Climate Center The maximum HDD and CDD reported for Hailey are 9153.52 HDD and 407.50 CDD (<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 0.98 AF daily, while the heating season averaged 0.47 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:

(130.0 AF/7588 HDD) x 9153.52 Max HDD = 153.3 AF

(90 AF/279 CDD) x 407.50 Max CDD = 131.5 AF

Total 284.8 AF

G. NARRATIVE/REMARKS/COMMENTS

Application for permit 37-22513 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 51,000 ft² elementary school. The system utilizes water from one well equipped with a 25 Hp pump. Flow into the building is measured using a McCrometer Ultra Mag Electromagnetic flow meter. 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 2012 by Cindy Yenter and was found to be within an acceptable +3.5% 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 Ultra Mag display, and 386 gallons per minute was the maximum sustained flow rate achieved (See attached photo). This rate is equivalent to 0.86 cfs and is approximately half of the permitted 1.7 cfs. When the permit was filed, the intention was to have two wells equipped with 25 Hp pumps, but due to budget limitations, the system was constructed with one production well. 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.

Volume data was provided from totalizer readings from the meter for the period from 4/30/2013 to 9/3/2014. One year of volume data was used (9/4/2013 to 9/3/2014) for purposes of this field exam and it indicates that approximately 220 AF were used during this period.

The actual volume recommended is slightly higher, as the measured volume from the totalizer readings was adjusted to allow sufficient volume to provide for extremely cold and/or hot years. The method used to adjust the volume was 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 0.86 cfs flow rate; a cooling volume of 131.5 AF; a heating volume of 153.3 AF, with a combined volume of 284.8 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	0.860 CFS	153.3 AF
COOLING	01/01 to 12/31	0.860 CFS	284.80 AF
<u>Totals:</u>		0.860 CFS	284.80 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

Bill Miller

Date

9-25-2014

Reviewer

Date

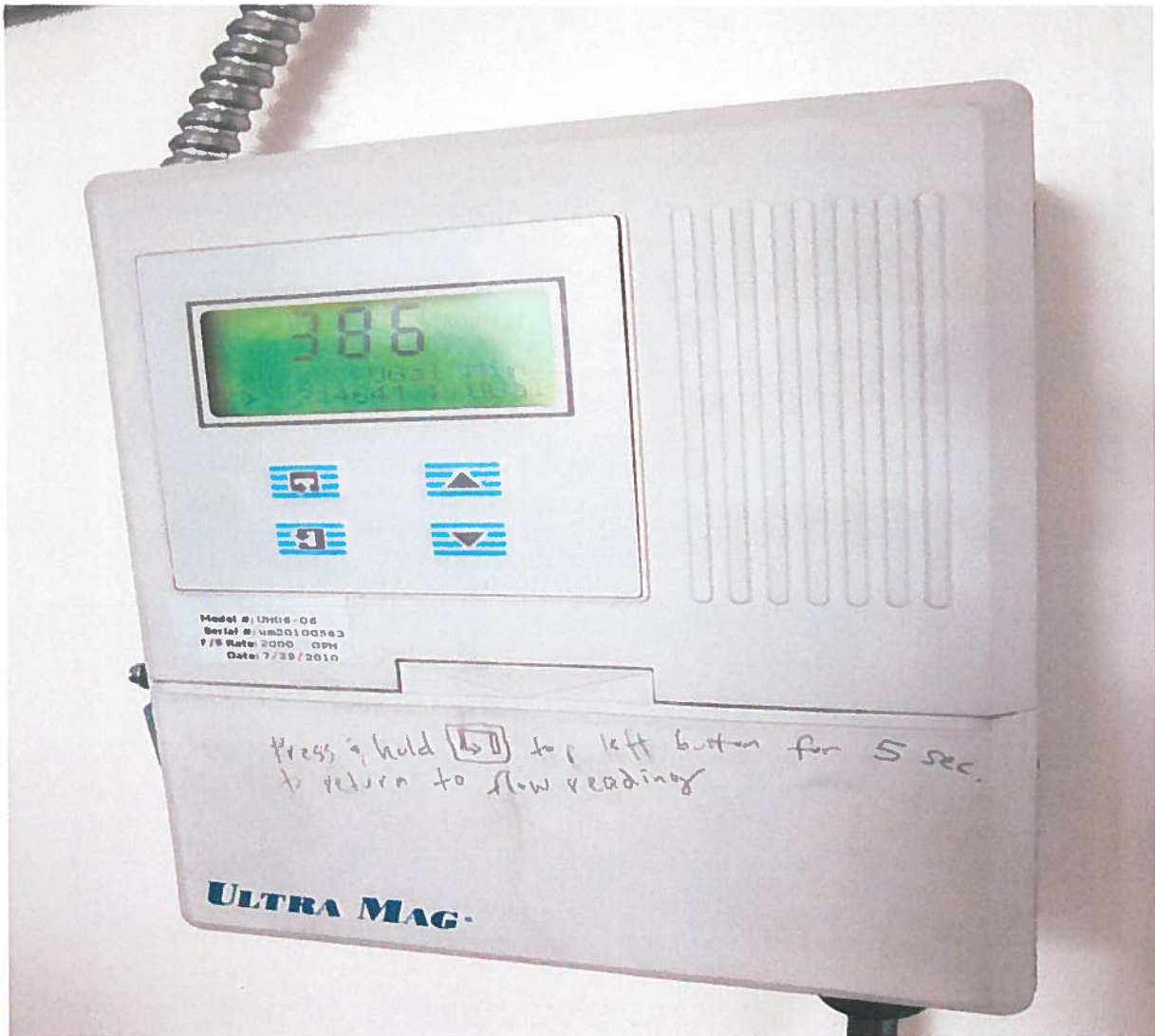


Figure 1: Meter display



Figure 2: Production Well



Figure 3: Injection Well



Figure 4: Heat Exchange Unit



Figure 5: Variable Frequency Drives and Part of Heat Exchange System

Legend

- Place of Use
- Water Right POD
- Injection Well

Place of Use

Water Right POD

Injection Well

Bellevue Elementary

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
4/30/2013	8:00 AM	4/30/13 8:00 AM	134,398,000	0					
5/8/2013	8:00 AM	5/8/13 8:00 AM	134,619,000	0	221,000	11,520	28	19	
5/15/2013	8:00 AM	5/15/13 8:00 AM	134,643,000	0	24,000	10,080	3	2	
5/22/2013	8:00 AM	5/22/13 8:00 AM	135,698,000	0	1,055,000	10,080	151	105	
5/29/2013	11:00 AM	5/29/13 10:00 PM	135,749,000	0	51,000	10,920	7	5	
6/5/2013	8:00 AM	6/5/13 8:00 AM	139,540,000	0	3,791,000	9,240	591	410	
6/19/2013	8:00 AM	6/19/13 8:00 AM	140,433,000	0	893,000	20,160	64	44	
6/26/2013	11:00 AM	6/26/13 11:00 AM	140,434,000	0	1,000	10,260	0	0	
7/3/2013	11:00 AM	7/3/13 11:00 AM	140,451,000	0	17,000	10,080	2	2	
7/10/2013	11:00 AM	7/10/13 11:00 AM	140,481,000	0	30,000	10,080	4	3	
7/17/2013	8:00 AM	7/17/13 8:00 AM	140,955,000	0	474,000	9,900	69	48	
7/24/2013	11:00 AM	7/24/13 11:00 AM	140,998,000	0	43,000	10,260	6	4	
7/31/2013	11:00 AM	7/31/13 11:00 AM	141,012,000	0	14,000	10,080	2	1	
8/7/2013	11:00 AM	8/7/13 11:00 AM	142,686,000	0	1,674,000	10,080	239	166	
8/14/2013	8:00 AM	8/14/13 8:00 AM	142,704,000	0	18,000	9,900	3	2	
8/21/2013	11:00 AM	8/21/13 11:00 AM	142,753,000	0	49,000	10,260	7	5	
8/28/2013	11:00 AM	8/28/13 11:00 AM	142,801,000	0	48,000	10,080	7	5	
9/4/2013	10:00 AM	9/4/13 10:00 AM	142,927,000	0	126,000	10,020	18	13	
9/11/2013	11:00 AM	9/11/13 11:00 AM	143,071,000	0	144,000	10,140	20	14	
9/18/2013	11:00 AM	9/18/13 11:00 AM	143,163,000	0	92,000	10,080	13	9	
9/25/2013	8:00 AM	9/25/13 8:00 AM	145,183,000	0	2,020,000	9,900	294	204	
10/2/2013	8:00 AM	10/2/13 8:00 AM	145,401,000	0	218,000	10,080	31	22	
10/9/2013	8:00 AM	10/9/13 8:00 AM	146,917,000	0	1,516,000	10,080	217	150	
10/16/2013	8:00 AM	10/16/13 8:00 AM	147,230,000	0	313,000	10,080	45	31	
10/23/2013	8:00 AM	10/23/13 8:00 AM	147,582,000	0	352,000	10,080	50	35	
10/30/2013	8:00 AM	10/30/13 8:00 AM	147,868,000	0	286,000	10,080	41	28	
11/6/2013	8:00 AM	11/6/13 8:00 AM	148,604,000	0	736,000	10,080	105	73	
11/13/2013	8:00 AM	11/13/13 8:00 AM	149,038,000	0	434,000	10,080	62	43	
11/20/2013	8:00 AM	11/20/13 8:00 AM	150,097,000	0	1,059,000	10,080	151	105	
11/27/2013	8:00 AM	11/27/13 8:00 AM	150,816,000	0	719,000	10,080	103	71	
12/4/2013	8:00 AM	12/4/13 8:00 AM	151,403,000	0	587,000	10,080	84	58	
12/11/2013	11:00 AM	12/11/13 11:00 AM	152,662,000	0	1,259,000	10,260	177	123	
12/18/2013	8:00 AM	12/18/13 8:00 AM	153,691,000	0	1,029,000	9,900	150	104	
12/23/2013	2:00 PM	12/23/13 2:00 PM	154,487,000	0	796,000	7,560	152	105	
12/27/2013	8:00 AM	12/27/13 8:00 AM	154,799,000	0	312,000	5,400	83	58	
12/30/2013	9:21 AM	12/30/13 9:21 AM	155,097,000	0	298,000	4,401	98	68	

1/2/2014	5:58 AM	1/2/14 5:58 AM	155,148,000	0	51,000	4,117	18	12	
1/3/2014	5:21 AM	1/3/14 5:21 AM	155,504,000	0	356,000	1,403	365	254	
1/6/2014	5:55 AM	1/6/14 5:55 AM	155,878,000	0	374,000	4,354	124	86	
1/7/2014	5:20 AM	1/7/14 5:20 AM	156,041,000	0	163,000	1,405	167	116	
1/8/2014	9:27 AM	1/8/14 9:27 AM	156,228,000	173	187,000	1,687	160	111	
1/9/2014	8:02 AM	1/9/14 8:02 AM	156,365,000	309	137,000	1,355	146	101	
1/10/2014	7:29 AM	1/10/14 7:29 AM	156,526,000	0	161,000	1,407	165	114	
1/13/2014	7:41 AM	1/13/14 7:41 AM	156,862,000	218	336,000	4,332	112	78	
1/14/2014	8:55 AM	1/14/14 8:55 AM	157,051,000	223	189,000	1,514	180	125	
1/15/2014	7:26 AM	1/15/14 7:26 AM	157,180,000	339	129,000	1,351	137	95	
1/16/2014	7:27 AM	1/16/14 7:27 AM	157,356,000	303	176,000	1,441	176	122	
1/17/2014	9:26 AM	1/17/14 9:26 AM	157,543,000	176	187,000	1,559	173	120	
1/21/2014	8:46 AM	1/21/14 8:46 AM	157,866,000	370	323,000	5,720	81	56	
1/22/2014	7:24 AM	1/22/14 7:24 AM	158,057,000	248	191,000	1,358	203	141	
1/23/2014	7:34 AM	1/23/14 7:34 AM	158,194,000	315	137,000	1,450	136	94	
1/24/2014	9:54 AM	1/24/14 9:54 AM	158,430,000	232	236,000	1,580	215	149	
1/27/2014	5:48 AM	1/27/14 5:48 AM	158,727,000	295	297,000	4,074	105	73	
1/28/2014	5:50 AM	1/28/14 5:50 AM	158,907,000	343	180,000	1,442	180	125	
1/29/2014	7:20 AM	1/29/14 7:20 AM	159,069,000	172	162,000	1,530	152	106	
1/30/2014	11:09 AM	1/30/14 11:09 AM	159,282,000	142	213,000	1,669	184	128	
1/31/2014	5:55 AM	1/31/14 5:55 AM	159,344,000	352	62,000	1,126	79	55	
2/3/2014	8:58 AM	2/3/14 8:58 AM	159,709,000	292	365,000	4,503	117	81	
2/4/2014	7:27 AM	2/4/14 7:27 AM	159,852,000	138	143,000	1,349	153	106	
2/5/2014	6:09 AM	2/5/14 6:09 AM	159,972,000	178	120,000	1,362	127	88	
2/6/2014	10:05 AM	2/6/14 10:05 AM	160,133,000	0	161,000	1,676	138	96	
2/7/2014	7:40 AM	2/7/14 7:40 AM	160,283,000	396	150,000	1,295	167	116	
2/10/2014	7:46 AM	2/10/14 7:46 AM	160,573,000	236	290,000	4,326	97	67	
2/11/2014	7:26 AM	2/11/14 7:26 AM	160,704,000	220	131,000	1,420	133	92	
2/12/2014	1:26 PM	2/12/14 1:26 PM	160,874,000	0	170,000	1,800	136	94	
2/13/2014	9:41 AM	2/13/14 9:41 AM	160,929,000	153	55,000	1,215	65	45	
2/14/2014	7:54 AM	2/14/14 7:54 AM	161,031,000	182	102,000	1,333	110	77	
2/18/2014	9:14 AM	2/18/14 9:14 AM	161,575,000	178	544,000	5,840	134	93	
2/19/2014	7:58 AM	2/19/14 7:58 AM	161,681,000	174	106,000	1,364	112	78	
2/20/2014	7:36 AM	2/20/14 7:36 AM	161,798,000	369	117,000	1,418	119	83	
2/21/2014	7:49 AM	2/21/14 7:49 AM	161,980,000	300	182,000	1,453	180	125	
2/24/2014	8:59 AM	2/24/14 8:59 AM	162,241,000	168	261,000	4,390	86	59	
2/25/2014	8:21 AM	2/25/14 8:21 AM	162,312,000	191	71,000	1,402	73	51	
2/26/2014	7:32 AM	2/26/14 7:32 AM	162,427,000	172	115,000	1,391	119	83	
2/27/2014	8:16 AM	2/27/14 8:16 AM	162,521,000	162	94,000	1,484	91	63	
2/28/2014	8:09 AM	2/28/14 8:09 AM	162,604,000	0	83,000	1,433	83	58	
3/3/2014	5:51 AM	3/3/14 5:51 AM	162,948,000	175	344,000	4,182	118	82	
3/4/2014	8:08 AM	3/4/14 8:08 AM	163,073,000	176	125,000	1,577	114	79	
3/5/2014	9:51 AM	3/5/14 9:51 AM	163,155,000	0	80,000	1,543	75	52	

5/14/2014	8:08 AM	5/14/14 8:08 AM	179,323,000	165	124,000	1,441	124	86	
5/15/2014	7:40 AM	5/15/14 7:40 AM	179,596,000	227	273,000	1,412	278	193	
5/16/2014	7:36 AM	5/16/14 7:36 AM	179,923,000	0	327,000	1,436	328	228	
5/19/2014	7:30 AM	5/19/14 7:30 AM	180,421,000	0	498,000	4,314	166	115	
5/20/2014	7:50 AM	5/20/14 7:50 AM	180,709,000	0	288,000	1,460	284	197	
5/21/2014	7:35 AM	5/21/14 7:35 AM	181,009,000	0	300,000	1,425	303	211	
5/22/2014	7:59 AM	5/22/14 7:59 AM	181,316,000	0	307,000	1,464	302	210	
5/27/2014	6:53 AM	5/27/14 6:53 AM	184,021,000	0	2,705,000	7,134	546	379	
5/28/2014	8:47 AM	5/28/14 8:47 AM	184,239,000	0	218,000	1,554	202	140	
5/29/2014	7:59 AM	5/29/14 7:59 AM	184,254,000	0	15,000	1,392	16	11	
5/30/2014	6:58 AM	5/30/14 6:58 AM	184,518,000	0	264,000	1,379	276	191	
6/2/2014	6:08 AM	6/2/14 6:08 AM	185,195,000	176	677,000	4,270	228	159	
6/3/2014	9:52 AM	6/3/14 9:52 AM	185,479,000	172	284,000	1,664	246	171	
6/4/2014	7:17 AM	6/4/14 7:17 AM	185,503,000	0	24,000	1,285	27	19	
6/5/2014	7:56 AM	6/5/14 7:56 AM	185,514,000	0	11,000	1,479	11	7	
6/6/2014	7:44 AM	6/6/14 7:44 AM	185,599,000	0	85,000	1,428	86	60	
6/9/2014	11:11 AM	6/9/14 11:11 AM	187,835,000	0	2,236,000	4,527	711	494	
6/10/2014	2:51 PM	6/10/14 2:51 PM	187,845,000	0	10,000	1,660	9	6	
6/11/2014	2:46 PM	6/11/14 2:46 PM	187,869,000	0	24,000	1,435	24	17	
6/12/2014	12:45 PM	6/12/14 12:45 PM	188,585,000	0	716,000	1,319	782	543	
6/13/2014	2:00 PM	6/13/14 2:00 PM	189,635,000	0	1,050,000	1,515	998	693	
6/16/2014	2:57 PM	6/16/14 2:57 PM	192,881,000	0	3,246,000	4,377	1,068	742	
6/17/2014	7:50 AM	6/17/14 7:50 AM	193,618,000	0	737,000	1,013	1,048	728	
6/18/2014	8:31 AM	6/18/14 8:31 AM	194,729,000	0	1,111,000	1,481	1,080	750	
6/19/2014	11:32 AM	6/19/14 11:32 AM	195,016,000	0	287,000	1,621	255	177	
6/20/2014	8:30 AM	6/20/14 8:30 AM	196,991,000	0	1,975,000	1,258	2,261	1570	
6/23/2014	7:45 AM	6/23/14 7:45 AM	199,945,000	0	2,954,000	4,275	995	691	
6/24/2014	8:00 AM	6/24/14 8:00 AM	200,344,000	0	399,000	1,455	395	274	
6/26/2014	8:00 AM	6/26/14 8:00 AM	200,866,000	0	522,000	2,880	261	181	
6/27/2014	7:45 AM	6/27/14 7:45 AM	201,010,000	0	144,000	1,425	146	101	
6/30/2014	7:22 AM	6/30/14 7:22 AM	204,035,000	0	3,025,000	4,297	1,014	704	
7/1/2014	7:35 AM	7/1/14 7:35 AM	204,984,000	0	949,000	1,453	941	653	
7/2/2014	9:54 AM	7/2/14 9:54 AM	205,500,000	0	516,000	1,579	471	327	
7/7/2014	3:17 PM	7/7/14 3:17 PM	205,609,000	0	109,000	7,523	21	14	
7/8/2014	1:40 PM	7/8/14 1:40 PM	205,610,000	0	1,000	1,343	1	1	
7/9/2014	1:40 PM	7/9/14 1:40 PM	205,614,000	0	4,000	1,440	4	3	
7/10/2014	7:33 AM	7/10/14 7:33 AM	205,615,000	0	1,000	1,073	1	1	
7/11/2014	7:33 AM	7/11/14 7:33 AM	205,617,000	0	2,000	1,440	2	1	
7/14/2014	11:37 AM	7/14/14 11:37 AM	205,623,000	0	6,000	4,564	2	1	
7/15/2014	8:09 AM	7/15/14 8:09 AM	205,627,000	0	4,000	1,232	5	3	
7/17/2014	8:06 AM	7/17/14 8:06 AM	205,631,000	0	4,000	2,877	2	1	
7/18/2014	7:20 AM	7/18/14 7:20 AM	205,632,000	0	1,000	1,394	1	1	
7/21/2014	8:03 AM	7/21/14 8:03 AM	205,638,000	0	6,000	4,363	2	1	

3/6/2014	8:45 AM	3/6/14 8:45 AM	163,223,000	159	70,000	1,374	73	51	
3/7/2014	5:46 AM	3/7/14 5:46 AM	163,304,000	179	81,000	1,261	92	64	
3/10/2014	6:56 AM	3/10/14 6:56 AM	163,891,000	165	587,000	4,390	193	134	
3/11/2014	10:12 AM	3/11/14 10:12 AM	164,040,000	170	149,000	1,636	131	91	
3/12/2014	9:06 AM	3/12/14 9:06 AM	164,087,000	0	47,000	1,374	49	34	
3/13/2014	7:28 AM	3/13/14 7:28 AM	164,214,000	173	127,000	1,342	136	95	
3/14/2014	8:26 AM	3/14/14 8:26 AM	164,290,000	153	76,000	1,498	73	51	
3/17/2014	9:41 AM	3/17/14 9:41 AM	165,112,000	164	822,000	4,395	269	187	
3/18/2014	10:05 AM	3/18/14 10:05 AM	165,162,000	0	50,000	1,464	49	34	
3/19/2014	7:52 AM	3/19/14 7:52 AM	165,282,000	316	120,000	1,307	132	92	
3/20/2014	7:53 AM	3/20/14 7:53 AM	165,370,000	215	88,000	1,441	88	61	
3/21/2014	7:52 AM	3/21/14 7:52 AM	165,488,800	316	118,800	1,439	119	83	
3/24/2014	6:26 AM	3/24/14 6:26 AM	165,640,000	0	151,200	4,234	51	36	
3/25/2014	6:15 AM	3/25/14 6:15 AM	165,699,000	0	59,000	1,429	59	41	
3/31/2014	5:58 AM	3/31/14 5:58 AM	166,044,000	177	345,000	8,623	58	40	
4/1/2014	7:49 AM	4/1/14 7:49 AM	166,180,000	323	136,000	1,551	126	88	
4/2/2014	5:15 AM	4/2/14 5:15 AM	166,293,000	236	113,000	1,286	127	88	
4/4/2014	10:33 AM	4/4/14 10:33 AM	166,577,000	0	284,000	3,198	128	89	
4/7/2014	8:06 AM	4/7/14 8:06 AM	167,525,000	171	948,000	4,173	327	227	
4/8/2014	6:25 AM	4/8/14 6:25 AM	167,602,000	170	77,000	1,339	83	58	
4/9/2014	8:00 AM	4/9/14 8:00 AM	167,694,000	0	92,000	1,535	86	60	
4/10/2014	7:00 AM	4/10/14 7:00 AM	167,799,000	155	105,000	1,380	110	76	
4/11/2014	8:10 AM	4/11/14 8:10 AM	167,839,000	136	40,000	1,510	38	26	
4/14/2014	7:29 AM	4/14/14 7:29 AM	170,254,000	351	2,415,000	4,279	813	564	
4/15/2014	7:59 AM	4/15/14 7:59 AM	170,327,000	0	73,000	1,470	72	50	
4/16/2014	7:47 AM	4/16/14 7:47 AM	170,371,000	0	44,000	1,428	44	31	
4/17/2014	9:03 AM	4/17/14 9:03 AM	170,443,000	0	72,000	1,516	68	47	
4/18/2014	7:57 AM	4/18/14 7:57 AM	170,466,000	0	23,000	1,374	24	17	
4/21/2014	7:29 AM	4/21/14 7:29 AM	172,814,000	172	2,348,000	4,292	788	547	
4/22/2014	7:28 AM	4/22/14 7:28 AM	172,840,000	0	26,000	1,439	26	18	
4/23/2014	6:08 AM	4/23/14 6:08 AM	173,011,000	184	171,000	1,360	181	126	
4/24/2014	10:00 AM	4/24/14 10:00 AM	173,073,000	0	62,000	1,672	53	37	
4/25/2014	7:28 AM	4/25/14 7:28 AM	173,125,000	168	52,000	1,288	58	40	
4/28/2014	7:35 AM	4/28/14 7:35 AM	174,782,000	181	1,657,000	4,327	551	383	
4/30/2014	7:50 AM	4/30/14 7:50 AM	174,844,000	147	62,000	2,895	31	21	
5/1/2014	7:22 AM	5/1/14 7:22 AM	174,884,000	0	40,000	1,412	41	28	
5/2/2014	7:22 AM	5/2/14 7:22 AM	175,080,000	0	196,000	1,440	196	136	
5/5/2014	7:36 AM	5/5/14 7:36 AM	176,960,000	207	1,880,000	4,334	625	434	
5/6/2014	10:14 AM	5/6/14 10:14 AM	177,249,000	0	289,000	1,598	260	181	
5/7/2014	7:32 AM	5/7/14 7:32 AM	177,313,000	160	64,000	1,278	72	50	
5/8/2014	7:58 AM	5/8/14 7:58 AM	177,351,000	162	38,000	1,466	37	26	
5/12/2014	7:50 AM	5/12/14 7:50 AM	179,157,000	165	1,806,000	5,752	452	314	
5/13/2014	8:07 AM	5/13/14 8:07 AM	179,199,000	0	42,000	1,457	42	29	

IDAHO DEPARTMENT OF WATER RESOURCES
Water Measurement Program

WATER MEASURING DEVICE CERTIFICATION

(Revised 11/2001)

District UWR

Diversion Name Bellevue Elementary H/C Production

Inventory Date _____

Inventory Examiner _____

PCC o.k.? ☐ Yes ☒ No

Test Date 9.14.12

Person performing test cynter

Exam complete? ☒ Yes ☐ No

Name: Blaine School Dist

Water Right No.: 37.22513

Legal Description: T2N R18E Sec. 36 1/4 NW 1/4 NE 1/4

Site Tag No.: D0057451

Diversion Name:

WMIS 1001302

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	(VFD) 25	Volume units	Acre-Feet <u>Gallons</u> Other (specify) _____
Meter Install Date	2010	Volume multiplier	1000
Manufacturer	McCrometer	Installation location	☐ Excel ☐ Fair ☐ Good ☒ Poor
Meter Type	Full mag	Pipe material	Steel
Meter Model	Ultramag	Outside diameter	6.66
Serial Number	20100563	Wall thickness	0.26
Size (nominal)	6	Inside diameter	
Measure Flow Rate?	☒ Yes ☐ No	Amount of straight pipe upstream from meter	<u>28</u> Inches Pipe Lengths
Measurement Units	☐ CFS ☒ GPM Other (specify) _____	Amount of straight pipe downstream from meter	<u>0</u> Inches Pipe Lengths
Flow Rate Multiplier	1	Stand Meter Type	☒ Sonic ☐ Pyg ☐ Collins ☐ Hall ☐ Anub ☐ Dye/chem ☐ Other _____
Measure Cumulative Volume?	☒ Yes ☐ No	Standard Meter Confidence	☐ Excellent 2% ☒ Good 5% ☐ Fair 10% ☐ Poor > 10%

4.98 on FLD12

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:

D0057451

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 _____

Butterfly valve installed @ lower end of flow tube.

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
94000	2		292.7				
94003	10:15	3000	~~292.7~~	2828	282.8	+3.5	
	(10:25)						

Notes – Comments – Calculations: Sound = 4 Speed = 4776

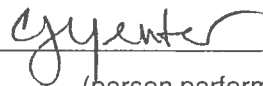
Test Section Not great

Reset Qmax to 600 gpm

WATER LEVEL DATA	
Does the well have access to measure water levels? ~ Yes ~ No (check one)	
Is this well part of USGS, IDWR, or another network of water level monitoring wells? ~ Yes ~ No (check one)	
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 9.14.12
(person performing measurements)

BELLEVUE ELEMENTARY H/C PRODUCTION WELL

LOG NAME:D0057451

START :09-14 12:35

END :09-14 12:45

INTERVAL:00:01:00

9/14/2012 12:35
+3.063E+0 ft/s
+2.827E+2 gal/m
+TOTAL 0000000 gal
NORMAL

9/14/2012 12:41
+3.091E+0 ft/s
+2.852E+2 gal/m
+TOTAL 0001700 gal
NORMAL

9/14/2012 12:36
+3.087E+0 ft/s
+2.849E+2 gal/m
+TOTAL 0000280 gal
NORMAL

9/14/2012 12:42
+3.110E+0 ft/s
+2.870E+2 gal/m
+TOTAL 0001961 gal
NORMAL

9/14/2012 12:37
+3.117E+0 ft/s
+2.876E+2 gal/m
+TOTAL 0000565 gal
NORMAL

9/14/2012 12:43
+3.093E+0 ft/s
+2.854E+2 gal/m
+TOTAL 0002247 gal
NORMAL

9/14/2012 12:38
+3.093E+0 ft/s
+2.855E+2 gal/m
+TOTAL 0000850 gal
NORMAL

9/14/2012 12:44
+3.103E+0 ft/s
+2.863E+2 gal/m
+TOTAL 0002533 gal
NORMAL

9/14/2012 12:39
+3.077E+0 ft/s
+2.840E+2 gal/m
+TOTAL 0001136 gal
NORMAL

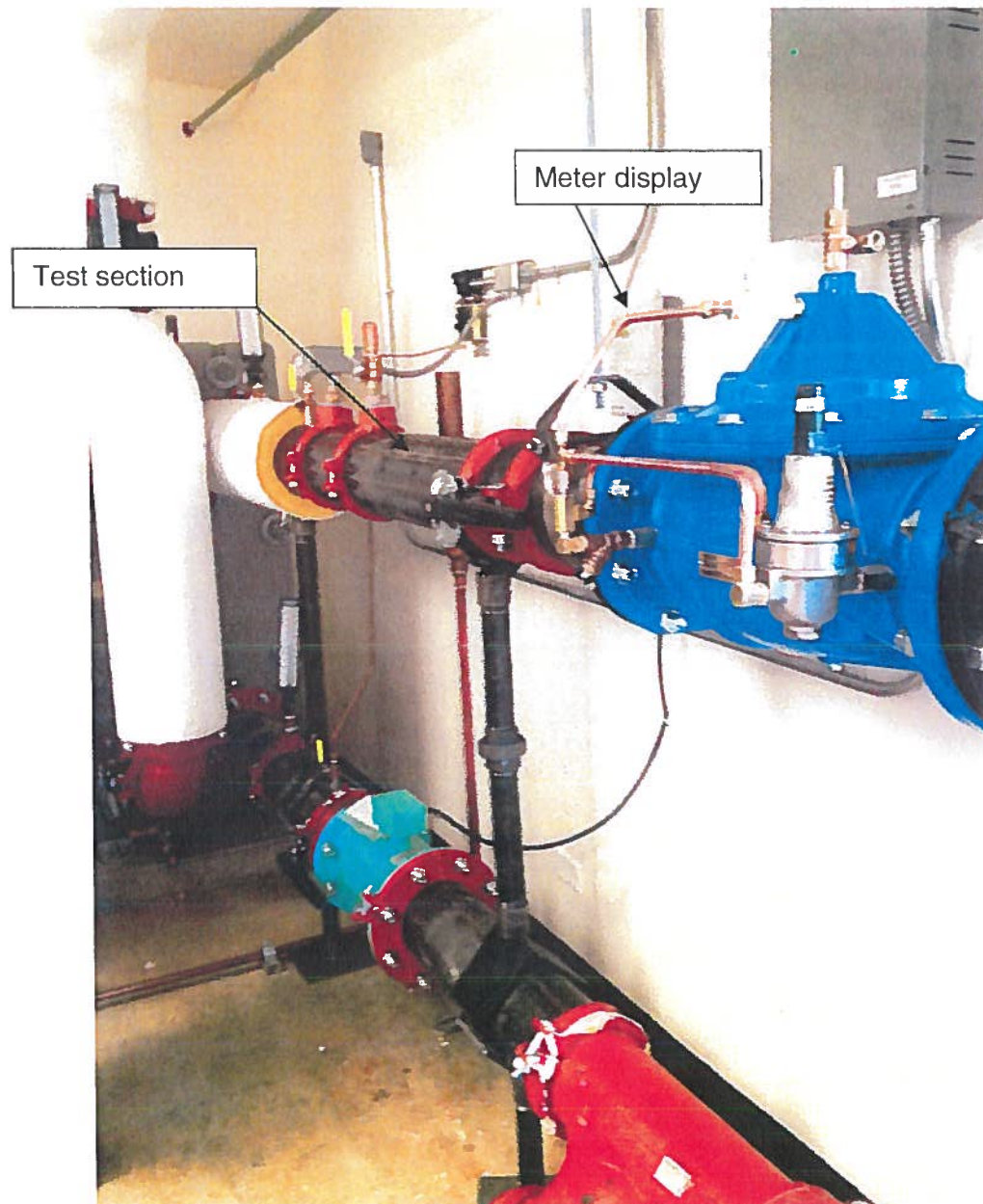
9/14/2012 12:45
+3.107E+0 ft/s
+2.867E+2 gal/m
+TOTAL 0002819 gal
NORMAL

9/14/2012 12:40
+3.069E+0 ft/s
+2.832E+2 gal/m
+TOTAL 0001421 gal
NORMAL

281.9 GPM
0.63 CFS

D0057451 Bellevue Elementary HC Production Well

Flow meter installation. Test section on upper line, downstream from heat exchanger.



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.