

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 36-16898

Exam Date: 8/22/2014

1. Current Owner: JEROME JOINT SCHOOL DISTRICT NO 261
125 4TH AVE W
JEROME ID 83338
(208)324-2392
2. Accompanied by: Troy Fletcher
Phone No: 308-3152
Relationship to Permit Holder: Superintendent

3. **SOURCE**
GROUND WATER

B. OVERLAP REVIEW

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

C. DIVERSION AND DELIVERY SYSTEM**1. LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER	SE1/4SW1/4SW1/4	Sec. 17, Twp 08S, Rge 17E, B.M.
JEROME County		
GROUND WATER	SE1/4SW1/4SW1/4	Sec. 17, Twp 08S, Rge 17E, B.M.
JEROME County		

Method of Determination: **Garmin GPS and WMIS points**

2.

PLACE OF USE: COOLING

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>
08S	17E	17											X						

Method of Determination: **ArcMap and aerial photography**

4.

<u>Well or Diversion</u>					<u>Pump Serial No. or Discharge</u>
<u>ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Size</u>
D0060568		40			6 in
D0060565		40			6 in

D. FLOW MEASUREMENTS

1.

<u>Measurement</u>						
<u>Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
Portaflo	Polysonic	FUJ		240332		7/19/2012

2. Measurements: On 7/19/2012 Cindy Yenter conducted a calibration test on the Badger flowmeter installed at the school. On this visit the meter tested within 1% of IDWR standards. Due to the recent calibration, a measurement was not recorded at the time of the field exam. During the field exam the Badger flowmeter was registering a flow of 346gpm (see attached photo). Troy indicated that this is standard operating for the cooling system.

Recommend flow rate of 346 gpm or 0.77 cfs for this license.

E. FLOW CALCULATIONS

_____ Additional Computation Sheets Attached

Measured Method: N/A

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: N/A
2. Volume Calculations for Other Uses:

The cooling system is utilized year round for spring, summer and fall school sessions. It is also used during the winter months to cool the gymnasium. (assume operating system 10 out of 12 months or 83%)

A memo from Michelle Edl demonstrates a method for calculating volume for heating and cooling using climate data and Cooling Degree Days for certain areas. (see attached)

According to totalizer data collected from the flowmeter, 36.5 AF of water was pumped through the system and re-injected into the aquifer from August 2013- August 2014. Climate data provided by Weather Underground reports Cooling Degree Days (CDD) at 732 days in Jerome for Aug. 2013 - Aug. 2014 (<http://www.wunderground.com/history>).

According to the Western Regional Climate Center the maximum CDD reported for Jerome is 1025.69 CDD (<http://www.wrcc.dri.edu/summary/Climsmsid.html>). (see attached)

Totalizer data from flowmeter = 36.5 AF

CDD from Aug. 2013- Aug. 2014 =732

Maximum CDD for Jerome area = 1025.69

Assume 10 months of year for cooling = 83%

(36.5 AF/732 CDD) x 1025.69 CDD = 51.1 AF

0.83 x 51.1 = 42.5 AF

Recommend a volume of 42.5 AF for cooling the facility.

G. NARRATIVE/REMARKS/COMMENTS

Application for permit was filed on May 24, 2011 for 1.1 cfs for non-consumptive cooling and heating use associated with the Jerome High School. The permit was approved on September 12, 2011 but the permit was lapsed due to lack of proof of beneficial use. On October 16, 2013 the school filed a Statement of Completion for submitting proof of beneficial use and permit 36-16898 was reinstated with an advanced priority date of June 8, 2011.

The system is a closed loop cooling system. (The heating component was never developed and should be dropped at licensing) Two 40 HP pumps and two 6-inch mainlines distribute the water to cool the high school. The cooling system is utilized for spring, summer and fall school sessions for the school building. It is also used during the winter months to cool the gymnasium. The used water is returned to the aquifer via injection well.

On August 22, 2014 I visited the school to obtain a flow rate and totalizer data for this field exam. The Badger flow meter was registering an instantaneous flow of 346 gpm or 0.77 cfs. (see attached picture) Troy indicated that this is standard operating for the cooling system. A year's worth of data was also collected from Troy for August 2013- August 2014. This total does not reflect a good solid volume component due to the on-demand cooling system and fluctuating temperatures in extremely hot or cold years. A memo from Michelle Edl demonstrates a method for calculating volume for cooling using climate data, Cooling Degree Days and estimated operation season. (see above calculations) A volume of 42.5 AF for cooling was calculated by means of this method.

I am recommending permit 36-16898 be licensed for 0.77 cfs with a volume of 42.5 AF for cooling uses associated with the Jerome High School.

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>
COOLING	01/01 to 12/31	0.770 CFS	42.5 AF
<u>Totals:</u>		0.770 CFS	42.5 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

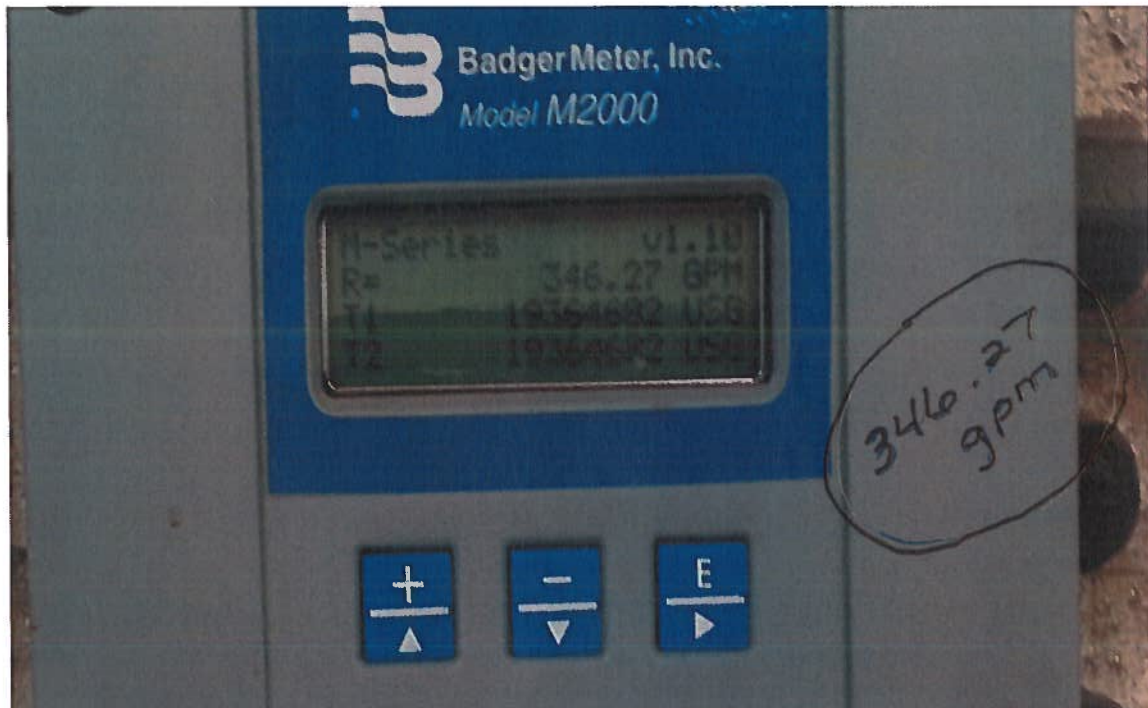
I. AUTHENTICATION

Field Examiner's Name Dana Reeder Date 8/27/14

Reviewer Michelle Edl Date 9/11/14

North Well
D0060568

South Well
D0060565



Closed Loop System

NESE

NWSW

18

SESE

SWSW

08S17E

Place of Use

North Well

South Well

Injection well

NENE

19

NWNW

20

Weather History for Jerome, ID

View Current Weather in Jerome, ID

From:

August

25

2013

To:

August

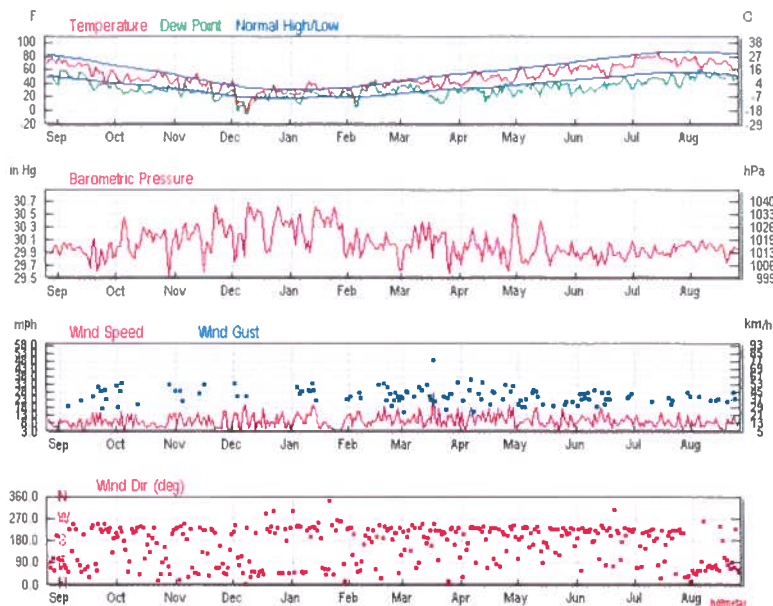
25

2014

Get History

	Daily	Weekly	Monthly	Custom		
			Max	Avg	Min	Sum
Temperature						
Max Temperature			102 °F	61 °F	7 °F	
Mean Temperature			86 °F	50 °F	2 °F	
Min Temperature			70 °F	38 °F	-8 °F	
Degree Days						
Heating Degree Days (base 65)			63	17	0	6213
Cooling Degree Days (base 65)			21	2	0	732 * 732
Growing Degree Days (base 50)			38	7	0	2633
Dew Point						
Dew Point			66 °F	33 °F	-10 °F	
Precipitation						
Precipitation			1.97 in	0.03 in	0.00 in	9.66 in
Snowdepth						
Wind						
Wind			51 mph	10 mph	0 mph	
Gust Wind			62 mph	26 mph	16 mph	
Sea Level Pressure						
Sea Level Pressure			30.74 in	30.04 in	29.38 in	

Custom Weather History Graph



Certify This Report

Search for Another Location

Airport:

KJER

Submit

Trip Planner

Search our weather history database for the weather conditions in past years. The results will help you decide how hot, cold, wet, or windy it might be!

Date:

August

25

Submit

Weather History & Observations

2013	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Aug	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
25	92	76	60	51	47	41	64	42	19	29.95	29.87	29.79	10	10	10	31	13	37	T	Rain Thunderstorm
26	86	71	55	55	49	44	83	54	25	30.01	29.92	29.84	10	10	10	16	8	23	T	Rain
27	90	75	60	55	51	45	78	50	21	29.95	29.87	29.79	10	10	10	14	9	21	0.00	
28	88	75	61	58	54	50	84	57	30	29.96	29.90	29.81	10	10	10	13	7	21	T	Rain
29	92	78	63	59	53	49	78	51	24	30.01	29.96	29.92	10	10	10	17	6	22	0.00	
30	88	74	59	49	44	38	60	39	17	30.09	30.01	29.95	10	10	10	15	6	20	0.00	
31	89	71	52	51	41	33	72	44	16	30.05	29.97	29.89	10	10	10	10	4	10	0.00	
2013	Temp. (°F)			Dew Point (°F)			Humidity (%)			Sea Level Press. (in)			Visibility (mi)			Wind (mph)			Precip. (in)	Events
Sep	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	low	high	avg	high	sum	
1	95	78	60	46	40	34	46	30	14	29.94	29.86	29.78	10	10	10	16	11	22	0.00	
2	85	75	64	63	56	46	87	63	38	30.01	29.88	29.79	10	10	10	14	8	17	T	Rain
3	79	70	61	65	61	59	93	73	52	30.14	30.04	29.98	10	10	10	16	9	21	T	

JEROME, IDAHO

Monthly Total Cooling Degree Days

(104670)

Base Temperature = 65 F

File last updated on Apr 4, 2013

*** Note *** Provisional Data *** After Year/Month 201304

a = 1 day missing, b = 2 days missing, c = 3 days, ..etc.,

z = 26 or more days missing, A = Accumulations present

Long-term means based on columns; thus, the monthly row may not sum (or average) to the long-term annual value.

Months with 5 missing days or less use mean for missing day(s)

Individual Months not used for annual or monthly statistics if more than 5 days are missing.

Individual Years not used for annual statistics if any month in that year has more than 5 days missing.

YEAR (S)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
1915	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	1.00m	0.00	0.00	0.00	0.00
1916	0.00	0.00	0.00	0.00	0.50	34.50	166.00	139.00	19.00	0.00	0.00	0.00a	359.00
1917	0.00	0.00	0.00	0.00	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	0.00	0.00b	0.00
1918	0.00	0.00	0.00	0.00c	2.50	220.50	277.45a	103.69b	23.50f	0.00	0.00	0.00b	604.14
1919	0.00a	0.00a	0.00	0.00a	52.04c	116.38a	154.50m	245.33b	44.00	0.00b	0.00	0.00b	457.74
1920	0.00a	0.00	0.00	0.00b	0.00c	54.11b	307.79c	221.50	46.03a	8.27a	0.00c	0.00	637.69
1921	0.00c	0.00a	0.00u	0.00c	2.00	98.00	240.50	182.50	4.50	0.00	0.00	0.00	527.50
1922	0.00d	0.00m	0.00	0.00	3.00	96.50	188.00	213.50	24.00	5.00	0.00	0.00	530.00
1923	0.00	0.00n	0.00	0.00a	8.00	40.00	287.00	155.00	82.50	0.00	0.00	0.00	572.50
1924	0.00	0.00	0.00	0.00	35.00	103.50	276.50	200.00	94.50	0.00	0.00	0.00	709.50
1925	0.00	0.00	0.00	0.00	16.50	131.00	366.00	175.50	27.00	0.00	0.00	0.00	716.00
1926	0.00	0.00	0.00	5.50	12.00	193.00	342.50	278.00	3.50	1.00	0.00	0.00	835.50
1927	0.00	0.00	0.00	6.00	19.00	91.50	287.00	195.50	22.00	3.00	0.00	0.00	624.00
1928	0.00	0.00	0.00	0.00	3.50o	1.07b	300.50	166.00	21.21a	0.00b	0.00z	0.00	488.78
1929	0.00	0.00	0.00	0.00	37.64c	83.65d	0.00z	321.50	28.00	0.00	0.00	0.00a	470.80
1930	0.00	0.00	0.00	1.50	19.00	85.00	349.50	298.00	39.00	0.00	0.00	0.00	792.00
1931	0.00	0.00b	0.00	0.00	31.50	145.86a	388.65d	272.00	59.50	0.00b	0.00	0.00	897.51
1932	0.00	0.00	0.00	0.00	11.00	118.00	249.00	143.00	34.00	0.50	0.00	0.00	555.50
1933	0.00	0.00	0.00	0.00	16.50	178.50	370.50	224.00	34.00	1.50	0.00	0.00	825.00
1934	0.00	0.00	0.00t	10.50	94.50	53.00	352.00	301.00	54.00	3.50	0.00	0.00	868.50
1935	0.00	0.00	0.00	0.00	2.00	76.50	284.50	235.00	58.50	4.50	0.00	0.00	661.00
1936	0.00	0.00	0.00	11.00	83.00	183.50	395.25c	242.00	24.83a	0.00	0.00z	0.00	939.58
1937	0.00	0.00	0.00	0.00i	12.00	68.28a	324.00	212.00	101.50	0.00r	0.00s	0.00	717.78
1938	0.00	0.00	0.00	0.00f	24.11d	103.50	289.00	236.00	127.00	1.00	0.00	0.00	780.61
1939	0.00	0.00	0.00	0.50	32.00	71.50	274.50	262.00	53.00	0.00	0.00	0.00	693.50
1940	0.00	0.00	0.00	0.00	44.50	216.00	319.50	270.00	61.50	0.00	0.00	0.00	911.50
1941	0.00	0.00	0.00	0.00j	42.00	88.00	350.50	226.50	15.00	0.00	0.00	0.00	722.00
1942	0.00	0.00	0.00	2.00	12.50	33.50	341.00	259.50	68.00	8.00	0.00	0.00b	724.50

1943	0.00	0.00	0.00	1.00	8.00	32.00	245.50	177.00	43.50	7.50	0.00	0.00	514.50
1944	0.00	0.00	0.00	0.00	17.50	33.50	212.00	141.00	68.00	2.00	0.00	0.00	474.00
1945	0.00	0.00	0.00	0.00	0.50	38.00	278.00	246.00	67.00	0.00	0.00	0.00	629.50
1946	0.00	0.00	0.00	3.50	0.00	43.00	152.00 ⁿ	235.50	49.00	0.00	0.00	0.00	331.00
1947	0.00	0.00	0.00	0.00	39.00	22.00	324.00	194.50	49.50	5.00	0.00	0.00	634.00
1948	0.00	0.00	0.00	0.00	22.00	84.00	179.00	160.00	39.00	0.00	0.00	0.00	484.00
1949	0.00	0.00	0.00	0.00	5.50	52.50	153.50 ^j	217.52 ^a	65.50	0.00 ^b	0.00	0.00	341.02
1950	0.00	0.00	0.00	0.00	0.00	38.50	161.50	77.00 ^p	11.50 ^v	0.00	0.00 ^a	0.00	200.00
1951	0.00	0.00	0.00	0.00	7.50	38.00	318.00	176.18 ^a	29.00	0.50	0.00	0.00	569.18
1952	0.00	0.00	0.00	0.00	6.50	52.50	214.00	189.00	42.00	0.00	0.00	0.00	504.00
1953	0.00	0.00	0.00	0.00	0.00 ^a	16.00	270.50	184.50	52.50	0.50	0.00	0.00 ^c	524.00
1954	0.00	0.00	0.00 ^a	0.00	40.00	68.00	278.50	129.50	43.00	0.00 ^c	0.00 ^a	0.00	559.00
1955	0.00	0.00	0.00 ^a	0.00	2.58 ^a	92.68 ^b	225.00	279.50	78.00	0.00 ^a	0.00	0.00	677.76
1956	0.00	0.00	0.00	0.00 ^a	39.00	87.78 ^c	285.00	146.00	47.07 ^a	0.00	0.00	0.00	604.85
1957	0.00	0.00	0.00	0.00	2.50	97.50	254.50	193.00	57.50	1.50	0.00	0.00 ^e	606.50
1958	0.00	0.00	0.00	0.00	99.00	104.00	219.00	289.50	54.50	1.50	0.00	0.00	767.50
1959	0.00	0.00	0.00	0.00	12.50	161.50	305.00	139.00	53.50	0.00	0.00	0.00	671.50
1960	0.00	0.00	0.00	0.00	21.00	108.00	374.50	163.00	59.00	1.00	0.00	0.00	726.50
1961	0.00	0.00	0.00	0.00	24.00	207.50	318.00	337.50	8.00	0.00	0.00	0.00	895.00
1962	0.00 ^a	0.00	0.00	3.00	0.00	98.50	182.50	158.00	32.50	0.00	0.00	0.00	474.50
1963	0.00	0.00	0.00	0.00	14.50	32.50	197.50	235.00	124.00	8.00	0.00	0.00	611.50
1964	0.00	0.00	0.00	0.00	15.00	49.00	287.00	175.50	0.00	1.00	0.00	0.00	527.50
1965	0.00	0.00	0.00	0.00	4.00	71.00	203.00	165.00	0.50	0.00	0.00	0.00	443.50
1966	0.00	0.00	0.00	0.00	57.00	102.00	283.50	238.50	106.00	0.00	0.00	0.00	787.00
1967	0.00	0.00	0.00	0.00	24.50	78.00	346.00	380.00	123.00	0.00	0.00	0.00	951.50
1968	0.00	0.00	0.00	0.00	12.00	115.50	342.00	145.00	47.00	0.00	0.00	0.00	661.50
1969	0.00	0.00	0.00	4.50	29.00	91.00	285.00	299.50	87.50	0.00	0.00	0.00	796.50
1970	0.00 ^a	0.00	0.00	0.00	4.00	148.00	289.00	305.00	8.50	0.00	0.00 ^b	0.00	754.50
1971	0.00	0.00	0.00	0.00	12.00	73.50	267.00	355.50	35.00	0.00	0.00	0.00	743.00
1972	0.00	0.00	0.00	0.00	33.00	115.50	260.00	271.50	34.00	0.00	0.00	0.00	714.00
1973	0.00	0.00	0.00	0.00	38.50	160.50	294.00	254.00	54.00	2.00	0.00	0.00	803.00
1974	0.00	0.00	0.00	1.00	14.00	250.50	300.50	205.00	59.00	2.50	0.00	0.00	832.50
1975	0.00	0.00	0.00	0.00	1.00	25.00	357.00	110.00	52.00	0.00	0.00	0.00	545.00
1976	0.00	0.00	0.00	0.00 ^a	3.00	58.00	251.00	94.00	53.04 ^b	0.00	0.00	0.00	459.04
1977	0.00	0.00	0.00	12.50	0.00	179.00	217.50	255.50	51.72 ^a	0.00	0.00	0.00	716.22
1978	0.00	0.00	0.00	0.00	6.00	71.50	250.50	153.00	47.50	0.00	0.00	0.00	528.50
1979	0.00	0.00 ^a	0.00	0.00	15.50	125.50	266.00	189.00	63.50	4.00	0.00	0.00	663.50
1980	0.00	0.00	0.00	0.50	14.00	88.50	229.00	136.92 ^a	29.50	0.00	0.00	0.00	498.42
1981	0.00	0.00	0.00	0.00	2.00	63.10 ^a	227.00	317.50	92.00	0.00 ^a	0.00	0.00	701.60
1982	0.00	0.00	0.00	0.00	1.00	87.00	170.50	223.00	32.50	0.00	0.00	0.00	514.00
1983	0.00	0.00	0.00	0.00	47.00	35.00	166.50	271.00	31.00	0.00	0.00	0.00	550.50
1984	0.00	0.00	0.00	0.50	7.50	50.00	247.00	248.00	49.50	0.00	0.00	0.00	602.50
1985	0.00	0.00	0.00	0.00	30.50	111.00	401.00	136.00	2.50	0.00	0.00	0.00	681.00
1986	0.00	0.00	0.00	0.00	52.50	179.00	172.50	302.50	26.50	0.00	0.00	0.00 ^a	733.00
1987	0.00	0.00	0.00	0.00 ^z	40.50	146.00	181.50	182.00	68.00	4.50	0.00	0.00	622.50
1988	0.00	0.00	0.00	0.00	29.50	197.50	304.50	192.00	45.00	3.00	0.00	0.00	771.50
1989	0.00	0.00	0.00	1.00	7.50	84.50	334.00	167.00	40.00	0.00	0.00	0.00	634.00
1990	0.00	0.00	0.00	2.00	0.00	109.50	304.50	245.00	131.50	0.50	0.00	0.00	793.00

1991	0.00	0.00	0.00	0.00	0.00	21.50	296.57 a	305.50	61.00	0.00	0.00	0.00	684.57
1992	0.00	0.00	0.00	6.50	33.50	146.00	155.00	265.50	29.50	17.00	0.00	0.00	653.00
1993	0.00	0.00	0.00	0.00	53.00	46.00	39.50	103.50	37.00	4.50	0.00	0.00	283.50
1994	0.00	0.00	0.00	9.50	13.50	128.50	318.00	289.00	51.50	0.00	0.00	0.00	810.00
1995	0.00	0.00	0.00	0.00	0.50	37.50	202.00	200.00	72.00	0.00	0.00	0.00	512.00
1996	0.00	0.00	0.00	0.00	6.00	102.50	312.50	233.50	42.00	8.00	0.00	0.00	704.50
1997	0.00	0.00	0.00	0.00	38.50	63.50	199.50	255.50	99.00	8.50	0.00	0.00	664.50
1998	0.00	0.00	0.00	0.00	1.00	11.50	371.50	288.50	140.50	0.00	0.00	0.00	813.00
1999	0.00	0.00 a	0.00	0.00	13.50	93.00	203.05 a	255.00	24.00	0.00	0.00	0.00	588.55
2000	0.00	0.00	0.00	2.00	20.00	131.50	324.50	320.00	66.00	2.00	0.00	0.00 a	866.00
2001	0.00	0.00	0.00	2.00	65.50	138.00	304.50	360.50	97.50	5.00	0.00	0.00	973.00
2002	0.00	0.00	0.00	0.00	33.00	178.00	402.50	145.50	84.00	0.00	0.00	0.00	843.00
2003	0.00	0.00	0.00	0.00	67.50	129.00	425.50	319.50	59.50	24.69 d	0.00	0.00	1025.69
2004	0.00	0.00	0.00	0.00	10.00	90.00	297.00	227.50	41.00	1.50	0.00	0.00	667.00
2005	0.00	0.00	0.00	0.00	9.00	67.50	335.50	263.50	40.00	1.00	0.00	0.00	716.50
2006	0.00	0.00	0.00 z	0.00	54.50	165.50	451.50	223.00	65.00	1.50	0.00	0.00	961.00
2007	0.00	0.00	0.00	2.00	30.00	153.50	455.50	290.50	81.00	0.00	0.00	0.00	1012.50
2008	0.00	0.00	0.00	0.00	25.50	141.50	349.50	258.50	33.00	12.00	0.00	0.00	820.00
2009	0.00	0.00	0.00	0.00	54.00	69.00	334.00	240.00	131.00	0.00	0.00	0.00	828.00
2010	0.00	0.00	0.00	0.00	3.50	62.00	157.50 h	219.50	36.50	26.50	0.00	0.00	348.00
2011	0.00 a	0.00	0.00	0.00	0.00	47.50	267.50	294.50	83.50	22.50	0.00	0.00	715.50
2012	0.00 a	0.00	0.00	15.50	19.50	97.50	400.00	319.50	42.50	0.00	0.00	0.00	894.50
2013	0.00	0.00	0.00	0.00 z	0.00 z	0.00 z	0.00 z	0.00 z	0.00 z	0.00 z	0.00 z	0.00 z	0.00

Period of Record Statistics

MEAN	0.00	0.00	0.00	1.12	21.33	95.60	284.08	225.94	53.14	2.25	0.00	0.00	683.99
S.D.	0.00	0.00	0.00	2.91	21.68	53.24	73.76	64.42	30.83	5.00	0.00	0.00	149.50
SKEW	0.00	0.00	0.00	3.18	1.39	0.64	-0.23	0.07	0.82	3.27	0.00	0.00	-0.02
MAX	0.00	0.00	0.00	15.50	99.00	250.50	455.50	380.00	140.50	26.50	0.00	0.00	1025.69
MIN	0.00	0.00	0.00	0.00	0.00	1.07	39.50	94.00	0.00	0.00	0.00	0.00	283.50
NO YRS	98	96	95	93	95	96	91	95	94	96	95	98	78

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.

8-17	9229201
9-17	12117434
10-7	13454853
10-31	14284045
11-7	14549835
1-8-13	15903520
1-25-13	15903591
2-9-13	15903861
3-17-13	15918401
4-2-13	15923232
4-9-13	15956897
5-6	16020218
5-17	16273240
7-1	16641270
8-27	18092900
9-27	19036092
11-25	19499343

8/22/14 29989607

8/19/14 29989607 } 36.5
8/27/13 18092900 }

$$(36.5 \text{ AF} / 732) \times 1025.69 = 51.1 \text{ AF}$$

$$51.1 \times 0.83 = 42.5 \text{ AF}$$

