

MEMORANDUM

Date: February 16, 2012
To: Water Right File 78-7346
From: medl
Re: license review

Applicant

The permit was issued to Kay and Forest Williams. According to Adams county taxlot information the point-of-diversion and place-of-use are within property owned by the Williams Family Trust. The address given by the contemporary taxlot layer is the same as the address submitted on the permit application and on the 1995 field exam report.

Both Kay and Forest Williams still reside at one of the places-of-use. No assignment is needed.

Source & Point of Diversion

The source of the water is a low temperature, geothermal well located within Williams Family Trust property, approximately 0.2 miles almost due north of the places-of-use. The well location has not yet been GPSd by the geothermal group. I created the point-of-diversion shape based on aerial photography and confirmation from Kay Williams.

Water Use

Beneficial use of the water was confirmed during the exam. The only permitted use confirmed by the examiner was space heating. The examiner found hobby, tropical fish in a pond but no "for profit" fish propagation.

Pond

The field examiner records the dimensions of a pond which receives some of the discharge water but made no recommendations related to its use in her report. In recent correspondence, the examiner recommended an aesthetic use.

In a phone conversation that I had with Kay Williams in January 2012, she stated that she no longer maintains fish in the pond and that a pond existed in that location when they bought the property. It is visible in 1992 aerial photography. The Williams excavated and enlarged it somewhat for their use. According to the field examiner, the pond dimensions are 20 x 30 x 3 = 1800 cubic ft or 0.04 acre-ft. The licensed flow rate is 0.03 cfs or 0.06 AF/day. The pond will store less than one day s worth of discharge from the system.

Space Heating

Temperature readings from the diversion (155 deg F) and the discharge (130 deg F) were given in the exam report. The typical temperature drop across a heat exchanger is ~10 deg F. The examiner found a 25 deg F drop across this system which appears excessive. However, the temperature of the water entering the heat exchanger is not known. The POD is some distance from the POUs. Some heat would be transferred to the surrounding ground as the water flows from the POD to the POUs.

No information about the heat exchangers was provided by the examiner. I requested heat exchanger specs or parameters from Mrs. Williams. They were not available. I understand that if the nameplates are still in place, they may be difficult to view. At least one of the heat transfer units is located in the crawl space beneath a home.

The examiner measured the rate of the geothermal water discharging from each residence during the exam. Those instantaneous measurements are not likely to be representative of the use for the heating season.

Rate and Volume

Rather than making recommendations based on the installed heating system assets, the examiner makes rate and volume recommendations based on a spreadsheet adaptation of Administrator's Memorandum, Application Processing No 23. Using this method at the licensing stage is a misapplication of this memo.

The examiner recommended that the peak heat transfer required a water flowrate of 0.01 cfs per space. The rates calculated by the spreadsheet are less than 0.01 cfs but 0.01 cfs is the minimum considered for licensing. The total rate recommended is 0.03 cfs (0.01 cfs per space). This is less than the pumping capability and less than the sum of the individual discharge rates which were measured during the exam. Although I disagree with the method used, I agree with the examiner's recommendation for rates for this system.

I compared this heating use with another geothermal space heating application and with a UIC application for heating which used a heat pump in a cold water open loop. I found that 0.03 cfs is a reasonable combined rate for the heating of these three spaces.

The examiner recommended volumes for each space and a total volume derived from the estimated peak heat transfer. I disagree with those recommendations. I believe that the recommended total volume is too low and that the parameters required in the spreadsheet estimate for volume have been misunderstood. Lacking concrete information about the volume of water historically used or the heat transfer capacity of the system, I estimated the volume for this license based on rules-of-thumb and comparison with another similar geothermal space heating use.

Place of Use

Two homes and a shop were found to utilize the geothermal water in a direct use, water to air system. I created the place-of-use shape based on available aerial photography and confirmed with the field examiner.

Point of discharge & Permit conditions

The system discharges water to the surface at two locations. One location is a field within the right holder's property. The other is the pond described above. The pond acts to cool the discharge water before it flows into the Little Salmon River.

Although the heating system water was not treated chemically, it could be very warm. Typical domestic hot water is 104-120 deg F. The examiner found that the water temperature at the discharge was 130 deg F, which would scald exposed skin but the right holder is not required to exhaust the heat value of this water. Excess water temperature and other pollutants are not under IDWR jurisdiction. The permit conditions related to the discharge will be dropped.

Measuring devices required by the permit were not in place. The examiner does not recommend that the devices be waived and there is no mention in the exam report that the permit holder discussed that requirement with the examiner. This use is not in an active water district. I requested and received a request for a waiver of the requirement from the right holder. The measuring device condition has been modified.

Combined Use

The shop and one home share a single lateral off the primary distribution pipe. The other home has a dedicated pipeline.

POU and POD overlap analysis found no overlapping water uses or shared wells. At least one cold-water well supplies domestic, in-house uses.

Calculations

The rate and volume for this right are based on estimates of use rather than confirmation of use. I agree with examiners rate and recommend 0.03 cfs. I recommend 5.2 AF for volume.

I calculated a space heating volume based on an adaptation of an ASHRAE method for estimating heat energy use. The equation is: $Vol = (HL \times HDD \times hr/day \times Cd) / (\Delta T1 \times K \times C \times \Delta T2)$. I used climate parameters from New Meadows Ranger Station (Co-op #106388), the nearest weather station to the POU. Please refer to the attached spreadsheet.

Sterling Method		V=(HL*DD*24*Cd)/(deltaT1*k*C*deltaT2)									
Parameter	Explanation										
V	heat value of the fuel ASHRAE or annual volume Sterling										
HL	peak heating load in BTU/hr generally, design peak load is used see memo 24 for estimate										
DD	annual heating degree days usually 65 deg F Base										
24	24 hrs/day										
Cd	correction factor; for standard construction choose from ASHRAE fig 1 for heating DD in range 4000-7000, Cd= 0.6 Cd 0.65 for more DD										
deltaT1	design indoor temp minus design outdoor temp delta T1= 74 70 -4										
k	correction factor to account for losses. Use .90 .9 is a fully-condensing boiler										
C	constant to correct for units for Volume in AF use C =2.72x10^6 BTU/AF-deg F										
deltaT2	temp of incoming geothermal water minus temp of outgoing delta T2= 25 in (source) 155/out (spent) 130										
Area of floor space	liveable floor space in ft ^2 given by assessor 4450 3 space total										
Geo-Heat gives 5-20 BTU/hr per square ft of floor space											
Admin memo 23 suggests range 25-75 BTU/hr-sq.ft.											
Suggested Range BTU/hr-ft^2	HL(BTU/hr) design or peak heating load	DD	hr/day	Cd	delta t1	k	C	delta t2			
5	22250	10392	24	0.65	74	0.9	2720000	25			
10	44500	10392	24	0.65	74	0.9	2720000	25			
15	66750	10392	24	0.65	74	0.9	2720000	25			
20	89000	10392	24	0.65	74	0.9	2720000	25			
25	111250	10392	24	0.65	74	0.9	2720000	25			
	144,892.00	10392	24	0.65	74	0.9	2720000	25	estimated peak load using admin memo 23/ Yenter spreadsheet		
30	133500	10392	24	0.65	74	0.9	2720000	25			
	144,365.00	10392	24	0.65	74	0.9	2720000	25	extrapolated peak load from Musgrove peak design day		
35	155750	10392	24	0.65	74	0.9	2720000	25			
36	160200	10392	24	0.65	74	0.9	2720000	25	estimated peak load based on R Sterling graph for normal home		
40	178000	10392	24	0.65	74	0.9	2720000	25			
45	200250	10392	24	0.65	74	0.9	2720000	25			
50	222500	10392	24	0.65	74	0.9	2720000	25			
55	244750	10392	24	0.65	74	0.9	2720000	25			
60	267000	10392	24	0.65	74	0.9	2720000	25			
65	289250	10392	24	0.65	74	0.9	2720000	25			
70	311500	10392	24	0.65	74	0.9	2720000	25			
Range of calculated results											
V (AF)/yr	V= (HL x DD x24 x Cd)/(delt1 x k x C x delt2)										
0.796472178											
1.592944356											
2.389416534											
3.185888712											
3.98236089											
5.186626824	5.186626824										
4.778833068											
5.16776194	5.16776194										
5.575305246											
	5.734599682										
6.371777424											
7.168249603											
7.964721781											
8.761193959											
Admin memo 23/ Yenter spreadsheet											
Required data	my inputs										
A	Area of liveable space ft squared 4450										
	2 story (N=1, Y=2) 1										
e	House efficiency factor 0.44										
Ti	Inside design tempeature in deg F 70										
To	Average outside design temperature in deg F -4										
S	Source temperature in deg F 155										
D	Heating or cooling degree days per season 10392										
H	Hours/day system operates 22										
Calculations											
Ts= 0.3 x (S-T1)	Temperature drop across the system 25.5										
E=[e x (Ti-To)] x A	Design heat load, BTU/hr 144892										
Q=E/((500 x Ts) x 448.8)	Flow rate required at given source temperture, cfs 0.025321										
	Flow rate required at given source temperature, gpm 11.36408										
Vdiv= Q x D x H/24 x 1.9835	Diverted volume of season, afa 478.4363										
Vdiv= Q x D x 1.9836	0										
Created by Michele Edl for 78-7346											

Musgrove extrapolation/reality check			
floor ft^2=	2824	4450	
BTU=	91615	x	94648 to 96161 computer printouts
			91615 w/de-rated garage
BTU1 78-734 x =	144,365.00		

Musgrove extrapolation/reality check	
floor ft^2=	2824 4450
BTU=	91615 x 94648 to 96 computer printouts
	91615 w/de-rated garage
BTU1 78-734 x =	144,365.00

U.S. Department of Commerce
National Oceanic & Atmospheric Administration**ANNUAL
CLIMATOLOGICAL SUMMARY
(1985)**National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Station: 106388/99999, NEW MEADOWS RS, Idaho

Elev. 3870 ft. above sea level

Lat. 44°58'N, Lon. 116°17'W

Date	Temperature (° F)														Precipitation (inches)											
Elem->	MMXT	MMNT	MNTM	DPNT	HTDD	CLDD	EMXT		EMNP		DT90	DX32	DT32	DT00	TPCP	DPNP	EMXP		TSNW	MXSD		DP01	DP05	DP10		
1985 Month	Mean Max.	Mean Min.	Mean	Depart. from Normal	Heating Degree Days	Cooling Degree Days	Highest	High Date	Lowest	Low Date	Number of Days				Total	Depart. from Normal	Greatest Observed		Snow, Sleet			Number of Days				
											Max ≥=90°	Max ≤=32°	Min ≤=32°	Min ≤=0°			Day	Date	Total Fall	Max Depth	Max Date	≥=.10	≥=.50	≥=1.0		
1	25.9	-4.0	11.0	-8.5	1669	0	39	22	-25	31	0	26	31	23	0.37	-3.69	0.29		21	5.0	22	1	1	0	0	
2	31.8	-3.9	14.0	-10.8	1427	0	45	24	-32	5	0	11	28	15	1.61	-0.83	0.34		8	19.3	28	12	6	0	0	
3	42.4	8.4	25.4	-4.7	1222	0	55	19	-5	11	0	2	31	7	1.54	-0.77	M			10.5	25	8	4	0	0	
4	58.3	26.7	42.5	2.3	664	0	75	15	17	20	0	0	24	0	0.93	-0.95	0.68		19	2.5	7	1	1	1	0	
5	66.1	33.0	49.6	0.6	473	0	84	24	16	5	0	0	10	0	1.87	-0.01	0.58		30	0.0	0		5	1	0	
6	73.6X	36.3X	55.0X	-1.6	296B	1B	90	20	28	26	1	0	10	0	1.07	-0.81	0.29		6	0.0	0		5	0	0	
7	89.4	42.3	65.9	2.2	32	65	96	10	33	25	17	0	0	0	0.72	0.18	0.39		30	0.0	0		2	0	0	
8	78.3	35.9	57.1	-4.2	239	2	91	27	29	9	2	0	10	0	0.84	0.02	0.54		1	0.0	0		2	1	0	
9	61.2	31.5	46.4	-6.2	553	0	75	4	12	29	0	0	16	0	3.70	2.38	1.85		9	0.0	0		6	1	1	
10	54.1	22.7	38.4	-4.0	816	0	67	3	8	9	0	0	28	0	2.29	0.34	1.00		23	0.0T	0T	31	4	2	1	
11	32.2	11.2	21.7	-9.7	1294	0	57	4	-11	23	0	15	30	8	2.64X	M	0.45		8	M	12	22	8	0	0	
12	23.3	-4.0	9.7	-12.4	1707	0	40	4	-23	11	0	28	31	23	1.10	-2.72	M			9.8X	13	2	1	0	0	
Annual	53.1X	19.7X	36.4X	-4.8	10392	68	96	Jul	-32	Feb	20	82	249	76	18.68X	M	M		Sep	MX	28	Feb	45	6	2	

Notes

(blank) Not reported.

+ Occurred on one or more previous dates during the month. The date in the Date field is the last day of occurrence. Used through December 1983 only.

A Accumulated amount. This value is a total that may include data from a previous month or months or year (for annual value).

B Adjusted Total. Monthly value totals based on proportional available data across the entire month.

E An estimated monthly or annual total.

X Monthly means or totals based on incomplete time series. 1 to 9 days are missing. Annual means or totals include one or more months which had 1 to 9 days that were missing.

M Used to indicate data element missing.

T Trace of precipitation, snowfall, or snowdepth. The precipitation data value will = zero.

Elem- Element Types are included to provide cross-reference for users of the > NCDC CDO System.

Station Station is identified by: CoopID/WBAN, Station Name, State.

S Precipitation amount is continuing to be accumulated. Total will be included in a subsequent monthly or yearly value. Example: Days 1-20 had 1.35 inches of precipitation, then a period of accumulation began. The element TPCP would then be 00135S and the total accumulated amount value appears in a subsequent monthly value. If TPCP = "M" there was no precipitation measured during the month. Flag is set to "S" and the total accumulated amount appears in a subsequent monthly value.

Dynamically generated Thu Jan 26 12:22:15 EST 2012 via <http://cdo.ncdc.noaa.gov/ancsum/ACS>

Data provided from the NCDC CDO System

Additional documentation can be found at <http://cdo.ncdc.noaa.gov/cdo/3220doc.txt>

NEW MEADOWS RANGER STN, IDAHO

Monthly Average Minimum Temperature (Degrees Fahrenheit)

(106388)

File last updated on Jan 9, 2012

*** Note *** Provisional Data *** After Year/Month 201112

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.

MAXIMUM ALLOWABLE NUMBER OF MISSING DAYS : 5

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
1905	-----z	-----z	27.03	33.20	36.73 a	40.10	41.84	42.00 a	33.60	25.55	19.23	9.90	30.92
1906	13.77	14.32	15.35	28.96 c	31.97	36.47	43.73 a	40.71	33.33	31.74	23.47	25.39	28.27
1907	11.65	21.54	27.35	28.40	33.19	39.10	44.58	39.00	35.63	30.90	23.00 a	17.55	29.32
1908	13.48	15.79 a	19.97	28.67	33.29	37.43	43.97	40.77	35.70	28.90	24.73	8.90	27.63
1909	16.35	22.54	23.23	26.27	31.52	41.60	43.42	41.52	39.67	29.55	27.93	10.68	29.52
1910	11.39	11.39	26.13	31.10	35.23	38.77	44.94	37.23	36.77	29.77 a	26.37	16.55	28.80
1911	13.36 q	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	9999.00
1912	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	9999.00
1913	-6.62 o	-0.07	14.77	27.70	37.00	40.90	42.55	38.52	27.83	22.32	23.67	4.71	25.45
1914	16.42	11.64	20.45	30.17	35.10	38.33	38.71	31.71	29.90	30.97	19.63	-4.06	24.91
1915	0.52	19.07	22.84	30.30	35.03	32.47	35.90	37.23	-----z	20.61 m	16.40	6.61	23.64
1916	-0.03 a	16.00	19.84	26.00	28.42	33.67	37.94	33.90	28.43	22.87	16.53	6.06	22.47
1917	1.42	5.25	5.29	25.93	36.19	33.67	38.87	33.48	34.73	22.74	23.63	27.35	24.05
1918	16.55	7.89	19.71	24.77	27.61	38.03	38.90	35.94	32.57	30.16	19.67	7.00	24.90
1919	3.61	14.79	17.94	28.00	31.48	33.47	36.16	36.48	28.13	22.10	15.07	-1.19	22.17
1920	2.68	5.24	15.32	25.10	29.19	36.37	39.84	35.74	33.50	27.39	21.83	14.71	23.91
1921	11.55	9.89	21.65	27.40	35.19	41.17	37.19	35.84	27.40	25.87	21.90	12.87	25.66
1922	-1.87	8.39	13.52	24.67	31.19	37.97	40.39	43.61	28.83	22.52	15.77	10.16	22.93
1923	9.77	2.96	10.39	27.13	36.71	40.73	44.52	38.65	30.33	28.10	19.60	8.35	24.77
1924	2.23	20.07	16.94	26.03	30.65	32.83	36.77	34.45	28.27	27.48	22.27	6.55	23.71
1925	15.16	19.57	21.35	31.67	38.35	40.83	42.52	36.87	35.63	25.87	23.30	19.61	29.23
1926	3.58	22.11	20.39	29.97	33.52	37.07	41.32	39.00	28.50	25.55	27.73	14.42	26.93
1927	13.39	19.11	18.65	28.67	33.35	38.17	37.61	36.94	34.10	29.19	29.73	1.39	26.69
1928	13.13	7.93	21.81	28.33	33.32	35.63	41.58	33.06	30.13	27.48	24.33	4.87	25.14
1929	-4.84	2.36	20.71	24.23	29.90	36.63	36.19	38.35	25.63	21.84	10.60	19.35	21.75
1930	-4.23	23.21	21.87	32.27	34.03	34.27	40.81	39.81	32.40	25.23	11.33	-1.81	24.10
1931	12.16	7.21	19.00	26.37	31.26	37.10	39.13	34.74	32.43	24.87	13.57	6.45	23.69
1932	3.39	7.52	20.84	27.57	35.10	39.73	40.32	36.10	26.20	24.65	24.97	4.45	24.24
1933	8.39	-1.46	16.87	25.37	32.65	41.50	40.19	37.19	29.70	24.23	20.73	23.45	24.90
1934	23.32	24.61	27.13	31.67	35.16	38.00	40.26	37.03	29.43	27.77	27.77	13.19	29.61
1935	10.35	11.32	18.00	28.03	30.19	36.77	39.16	35.16	29.00 a	23.61	14.17	9.61	23.78
1936	10.90	6.14	14.48	27.20	36.81	43.07	43.00	38.55	28.30	20.06	8.50	14.77	24.32

1984	3.62j	1.90i	19.77i	27.58m	32.32l	37.40e	41.19	42.68	32.55i	22.42	22.00	-2.03	27.28
1985	-3.97	-3.86	8.35	26.67	33.00	36.26c	42.32	35.87	31.53	22.71	11.17	-4.00	19.67
1986	8.52	18.71	24.35	24.77	32.45	42.89l	38.32	41.00	34.20	25.77i	19.06m	7.76n	27.79
1987	1.43j	13.29	22.81	25.79a	35.26	40.30	40.90	34.61	28.20	15.65	21.25n	11.55	26.84
1988	2.52	3.76	18.58	27.77	32.29	43.90	40.03	36.19	29.70	26.87	22.10	5.48	24.10
1989	6.61	-2.61	20.55	28.40	31.48	38.67	41.42	42.39	31.07	27.26	20.52a	14.29	25.00
1990	16.84	3.32	18.48	29.50b	30.84	37.37	42.19	43.97	34.20	25.16	20.57	-2.32	25.01
1991	2.42	19.07	22.68	26.10	30.71	33.83	41.42	40.48	32.93	18.75k	19.03	7.57a	25.11
1992	5.82i	19.24	24.32	26.94m	32.45	41.20	41.23	39.39	31.37	23.27a	18.50	5.60p	30.11
1993	5.80p	7.67p	21.74	29.69n	36.48	40.10	39.39	36.90j	30.94m	27.10	7.28e	15.73p	28.68
1994	14.00	6.86	17.00	29.77	36.06	37.40	41.81	40.71	31.97	24.35	15.50	13.16	25.72
1995	13.28b	19.71	21.42	27.47k	35.00	40.37	44.06	37.03	34.23	25.29	23.85c	20.73p	29.42
1996	13.83a	7.55	22.00	27.67	32.55	33.50l	36.74	35.94	32.13	26.77	24.20j	8.33s	26.13
1997	-----z	13.32	20.74	28.47	33.29	39.93	41.97	40.52	37.07	23.81j	22.00	6.84	28.41
1998	20.40k	16.86	19.97	26.87	35.65	38.80	46.65	40.06	38.93	23.74	28.03	12.39	29.81
1999	13.00	13.06j	17.38b	23.17a	28.12e	38.59c	36.87	41.84	25.90a	19.16f	22.30	6.85d	25.40
2000	5.60f	17.69c	18.03	25.17	33.35	35.93a	41.53a	37.55	30.76e	28.03b	13.62a	7.79c	26.31
2001	3.96f	9.04a	19.55	25.93b	32.03	37.62f	46.93a	42.20a	34.04e	25.81	22.80	8.46e	26.68
2002	10.94	3.21	15.16	26.60	33.48b	39.00c	46.19	39.36c	33.73	19.81d	20.40	20.03	25.66
2003	19.77	12.70h	-----z	-----z	-----z	-----z	48.20p	44.20k	31.31n	26.70k	8.24m	16.89m	19.77
2004	8.63l	11.31m	18.41i	25.94l	34.47l	41.00m	42.57j	42.95i	33.60j	28.15k	20.75j	15.90j	9999.00
2005	12.53l	3.84i	21.13h	27.90i	34.33j	37.62i	-----z	37.74h	29.14i	26.84l	14.00j	2.70k	9999.00
2006	13.68l	4.11i	19.00h	28.40j	30.73i	43.33i	44.35k	39.00h	32.70j	22.76j	20.35j	7.37l	9999.00
2007	-3.68l	15.67j	20.64i	26.72e	32.97	38.43	45.58	37.16	31.10	26.58	16.97	14.10	29.96
2008	4.73a	10.59	14.55	21.20	33.77	36.67	40.06	40.55	29.27	23.84	24.03	7.71	23.91
2009	5.32	8.68	15.23	26.80	31.29	42.10	43.45	43.35	34.60	25.35	16.87	4.00	24.75
2010	18.00	16.86	17.68	25.63	30.39	41.37	40.61	39.58	32.10	28.74	18.40	13.16	26.88
2011	7.55	4.86	23.39	26.03	32.65	38.77	41.29	41.35	33.40	28.45	14.00g	7.20k	27.77
2012	15.00z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	-----z	9999.00

Period of Record Statistics

MEAN	8.25	11.71	18.62	26.98	33.02	38.64	41.45	38.77	32.10	25.66	20.14	11.16	25.47
S.D.	7.13	6.94	4.61	2.43	2.34	2.50	2.61	2.92	3.29	3.14	4.80	6.72	1.94
SKEW	-0.29	-0.12	-0.54	0.03	0.03	-0.15	0.26	0.16	0.38	-0.04	-0.51	-0.12	-0.04
MAX	25.06	26.18	27.35	33.20	38.35	44.85	50.32	46.13	41.63	34.23	29.73	27.35	29.61
MIN	10.74	-3.86	5.29	21.04	27.61	32.47	35.90	31.71	25.63	15.65	7.28	-4.42	19.67
NO YRS	87	94	94	94	98	96	98	92	89	87	87	89	60

Form 235-1
3/89

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JUN 1 1989

Department of Water Resources
Western Regional Office

Drilling Permit No. 78-89-2-002
Water Permit No. _____
Injection Permit No. _____

RECEIVED

MAY 26 1989

State of Idaho
Department of Water Resources

DRILLING PERMIT

1. Applicant Forrest and/or Kay Williams
2. Address Box 266
New Meadows 83654 Telephone 347-2417
☒ Well Owner ☐ Well Operator ☐ Other, specify _____
3. Proposed well location SW 1/4 SW 1/4, or Gov't lot No. _____,
Sec. 25, Twp. 20N, Rge. 1E, County Adams Co.,
Lot, block and subdivision _____
4. Proposed use of well: (Check all that apply)
☐ Domestic ☐ Stockwater ☐ Monitoring
 No. of households _____ No. of livestock _____
☐ Irrigation ☐ Industrial ☐ Municipal
☐ Injection ☒ Other, Specify Home Heating
5. Well construction information:
☒ New well ☐ Deepen ☐ Replace
Proposed surface diameter 8" Maximum depth 40'
Anticipated bottom hole temperature:
☐ 85°F or less (Cold water well)
☒ 85°F to 212°F (Low temp. geothermal well)
☐ 212°F or more (Geothermal well)
6. Anticipated construction start date May 25, 1989
7. Well Driller (if known) Al Menasco
Address M^cCall, ID
8. Applicant's signature _____
Title _____
Date _____

ACTION OF DEPARTMENT OF WATER RESOURCES

This Permit is Approved.

If approved, this permit authorizes the construction of a well subject to the following conditions:

GENERAL CONDITIONS

1. The well must be constructed in compliance with the applicable statutes, specific conditions of approval shown on the water right permit, injection well permit, transfer or amendment and the rules and regulations of the Department for water appropriation, injection wells and well construction standards.
2. This drilling permit is valid for two (2) months from its date of issuance for the start of construction and is valid for one (1) year from the date of issuance for completion of the well unless an extension has been granted.
3. This permit does not constitute the approval of the District Health Department or the Idaho Department of Health and Welfare which may be required before construction of this well.
4. The well shall be constructed by a driller currently licensed in the State of Idaho who must maintain a copy of the drilling permit at the drilling site.
5. Issuance of this drilling permit does not authorize trespass on the land of another party.
6. This permit does not constitute other local, county, state or federal approvals which may be required for construction of a well.
7. This drilling permit does not represent a right to divert and use the water of the State of Idaho.
8. If a bottom hole temperature of 85°F or greater is encountered, well construction shall cease and the well driller and the well owner shall contact the Department immediately.

SPECIFIC CONDITIONS

Dated this 26th day of May, 1989.

Signed Bobby D. Hanna
Title Chief, Resource Protection Bureau

Receipt No. C107184 Received by K. Young Fee 10.00 Date 5/26/89

EXTENSION OF DRILLING PERMIT

Approval Date _____ Extension approved by _____
This extension is good for 60 days beyond the above extension approval date.

2-13-12 Michelle - I faked this + hope it isn't clear.
 FEB 15 2011
 RECEIVED
 Kentucky Department of Water Resources
 KY -

