

MEMORANDUM

Date: June 20, 2012
To: Water Right File 47-17578, 47-17579 (splits of 47-7354) and 47-7809
From: medl
Re: licensing review

Introduction

There were two water right permits (47-7354 and 47-7809) authorizing water uses from three wells within the commercial and residential properties located at Lot 7 (SW1/4SW1/4) Sec 33, Township 8 South, Range 14 East. The Woodman (or middle well) and the Flint well (or south well) appear to be connected and they are authorized by water right 47-7354. Water right 47-7809 authorizes a single point-of-diversion which is the Grigg well (or the north well).

Two IDWR examiners have confirmed beneficial use of the water diverted from these wells. Examiner T Blau found established uses for both water rights on August 22, 1987 but did not write up the Beneficial Use Field Reports. Examiner J Stanton revisited the site on November 9, 2004 and in 2009, completed a field report based on his visit and the 1987 notes and photos left by T Blau. Both examiners see that the Lot 7 complex has two systems but recommend that all of the uses be licensed under 47-7354.

I have reviewed the field report and the file contents of both permits. I see two systems and I have found that all of the uses can be assigned to a servient well or wells. A single license cannot accurately describe the dual system that has been developed.

The uses developed from the Grigg well exceed the rate authorized by 47-7809(A&B recombined). In contrast, the uses developed out of the Woodman and Flint wells are less than the rate authorized by 47-7354. The undeveloped portion of 47-7354 is sufficient to cover the overdeveloped portion of 47-7809. Therefore I am recommending 47-7809 be relinquished or voided based on no additional beneficial use and I am splitting 47-7354 into two parts. Split 47-17578 is for the uses that have the Woodman and Flint wells as their source and split 47-17579 for the uses that have the Grigg well as their source.

Applicant

Available Twin Falls county taxlot information for Lot 7 indicates that current ownership of the land does not match either the original permit holders or the assignees. Paul W Flint and/or David B Flint dba Flint Greenhouses of Idaho were assignees of both permits (47-7354 and 47-7809A&B recombined). IDSOS shows Flint Greenhouses Limited Partnership, #L1882, with status: Admin Cancel January 4, 2008.

I expect that additional splits of this water right will be needed. To facilitate those splits I am itemizing the water uses and separating them based on the four contemporary taxlot divisions.

Source and POD

Three, artesian, low-temperature geothermal wells provide the water for these rights. The earliest well was drilled for Jerry Woodman in 1977 and was deepened in 1980. This well is the middle well. The second well was drilled in 1982 for Golden Grigg. This is the north well. The third well was drilled in 1983 for the Flints. This well is the south well. Both the middle and the south wells appear to have been given the same A tag (A0003183) in the spatial data layer and have some connecting piping.

GPS coordinates for each well location were available, and Jim Stanton, one of the field examiners, created points-of-diversion for each well. The various data points had not been correlated and the wells had not been correctly positioned in the well layer of IDWRs database. I provided the complete well logs and the well locations to state office groundwater resource personnel. Well shapes based on the GPS coordinates have been created and are the PODs selected for these rights.

Water Use

System diagram

Examiner J Stanton provided a schematic of the water path from each of the wells to the points of discharge.

Except for the recreational pond or fish production, the uses are first-use of the geothermal water. The water is propelled by artesian pressure rather than pumps and appears to be managed as once through uses. Neither examiner mentions recirculation of the water.

Summary of water uses

Irrigation

No irrigation was confirmed by either examiner and none is recommended. I understand that the Banbury Pipeline supplies water to meet all of the cool water needs on the properties including irrigation of greenhouse plants and domestic cold water.

The 1-acre vineyard was found by examiner Stanton in Tax #1444 of Lot 7 during his 2004 visit. It has replaced a doublewide mobile home found by examiner T Blau in 1987 and the domestic, heating and recreation places-of-use that were associated with it. The source of water for that vineyard has not been identified. Documents obtained from the assessor's office cite a private well. I have not been able to confirm the existence of a cool-water well in this parcel.

Domestic

The domestic use is for internal, hot water only. Cool water is provided by the Banbury Pipeline. A total of 7 domestic uses on the complex were recommended by examiner T Blau. I concur with examiner Blau. The domestic uses are located in the

Grigg home

D Flint home

Packing house

Office

P Flint home

Woodman home and

Woodman doublewide mobile home on Tax #1444 **

**A double-wide mobile home existed on a portion of the Woodman property (Tax #1444) at the time of T Blau's 1987 field visit. Although it no longer exists, I am recommending the heating, domestic and recreation uses that he found.

Heating - Residential

Examiner T Blau recommends five residential heating places-of-use and made measurements of that use in four of those five homes. His measurements were taken at the

D Flint home

P Flint home

Woodman home and detached shop and

Woodman doublewide mobile home on Tax #1444**(see note above)

Examiner Blau also recommended heating use for Grigg home but did not take a measurement to confirm the quantity of the use. Therefore I am not recommending rate or volume above the standard for domestic use.

Examiner J Stanton recommended heating use in only four homes. He recommends forfeiture of all the uses associated with the Woodman doublewide mobile home. Although the former Grigg home no longer existed at the time of his visit, examiner Stanton recommends it as a heating place-of-use based on stub-ins that remained of the delivery system.

A newer doublewide mobile home is now located on the former Grigg home site. Information provided by the Twin Falls County Assessor shows that it uses geothermal water for heating.

Heating - Commercial

Both examiners recommend the following commercial (heating) places-of-use

Office

Packing House

Greenhouses

Bean house: a single vault Quonset style greenhouse

North greenhouse: a gutter-connected, 6-vault greenhouse

South greenhouse: a gutter-connected, 20-vault greenhouse.

An additional 6-vault, gutter-connected greenhouse was built on Tax #1656 of #1418 Lot 7 in 1992. I am not recommending that greenhouse as a place-of-use for these licenses.

Recreation – Private

One unenclosed pool and three, unenclosed hot tubs were found in use by examiner T Blau. The pool was (and is) located outside at the site of Grigg home. The hot tubs were located outside of the

P Flint home

Woodman home and

Woodman doublewide mobile home on Tax #1444**(see note above)

Recreation – Public Ponds for Wildlife or Fish Propagation

North and South ponds receive water cascaded from the higher priority, first uses of the geothermal water. There does not appear to be direct diversion piping from any of the wells to either pond. Not all of the diverted geothermal water ends up in the ponds. Some is discharged to septic systems or riverine land surface near the Snake River.

The North Pond

Discharge from the Woodman and Flint wells does not enter the North Pond. Only water sourced from the Grigg well discharges into the North pond.

Decreed Water right 47-7358 authorizes fish propagation in the North Pond. The measurement which confirmed beneficial use for that right was taken at a weir downstream and east from where the Grigg well system discharges to the North pond. The warm water discharged to the North Pond would have been included in the measurement for 47-7358.

The South Pond

The south pond receives cascaded water from the office, the single vault greenhouse and the 20-vault greenhouse. All three wells serve these places-of-use.

Rate

This system depends on artesian pressure rather than pumps to move the water. Therefore, the flow rates can be independent of the heating season demand. Examiner T Blau provided measurements for many of the uses during his field visit in the summer of 1987. His measurements are the basis for the rates that I recommend for licensing.

Please refer to the spreadsheets summarizing and itemizing the rates and volumes by tax lot division.

Volume

The commercial, heating, and recreation uses utilize the heat value of this groundwater and required theoretical calculations to obtain heating volumes for licensing. I have attached copies of work-spreadsheets showing my calculations to each of the individual uses.

Climate data

All the volume calculations required estimates of a few climate related parameters. The nearest weather station to the places-of-use was Buhl, Idaho (NWS coop station #101220). This station did not have climate data after 1963 but it did have statistics derived from its 54 year period-of-record which I used to estimate both the HDD and design minimum temperature. I assumed the data had normal distribution and I calculated the 95% HDD and the 95% minimum temperature using the mean $\pm$ 2 times the standard deviation. The HDD calculation is $6084.83 + 2 \times 535.86 = 7156.55$. The design min temp is $-4.46 - 2 \times 9.03 = -22.52$. These are generous estimates for these two parameters and they are expected to be valid for all but a few hours each year.

Method for Estimating Heating Volume

I calculated residential space heating and commercial heating volumes based on an adaptation of a 1985 ASHRAE method for estimating heat energy use. The equation is: $\text{Vol} = (\text{HL} \times \text{HDD} \times \text{hr/day} \times \text{Cd}) / (\Delta T_1 \times K \times C \times \Delta T_2)$ where:

HL = design heat loss including infiltration and ventilation in BTU/hr

HDD = number of 65 deg F heating degree days for the period.

24 hr/day

Cd = 0.85 is Geo-Heat recommendation for greenhouses or 0.9 for standard construction

Delta T1 = Design indoor temp minus design outdoor temp

K = 0.9 correction factor for energy efficiency

C = 2720000 (a constant to correct for units)

Delta T2 = Source water temp, 112 deg F (the lowest of the 3 the well water temperatures) minus discharge temp, deg F

Heating - Residential

Peak loads for the residential heating were estimated from Administrator's Memorandum; Application Processing No. 23, and modified to account for the actual, measured, flow rates. The volumes were calculated from the energy estimating equation above.

Heating - Commercial

The peak loads for the greenhouse heating were derived from hypothetical designs of each greenhouse¹, The volumes were based on the flow rates measured by examiner Blau and calculations from the energy estimating equation above.

Recreation – Private

I used Geo-Heat center software to estimate the pool and hot tub heating volumes².

Recreation – Public

The rates and volumes for the fish ponds are entirely dependent on the upstream uses. Although there may be some year-round discharge to the ponds, the summertime flow should be considerably less than the heating season flow.

Place of Use

I created the place-of-use shapes based on available aerial photography and a compilation of the maps

¹ Geothermal Direct-Use Engineering and Design Guidebook, 3rd ed, Geo-Heat Center, Oregon Institute of Technology, Klamath Falls, OR, 1998.

² Direct Use Software, Geo-Heat Center, Oregon Institute of Technology, Klamath Falls, OR, 2002 and 2010.

created by both field examiners.

For ease of reference, I have attached screen shots showing contemporary aerial photography of each of the pertinent taxlot divisions. I have labeled the screen shots, identifying the source well(s), the water rights and the place-of-use.

Point of discharge

The geothermal groundwater appears to flow continuously. It is used once and discharged. The discharge enters the septic system, local land surfaces, or one of the two local ponds.

Combined Use

POU and POD overlap analysis found only WR 47-7358 for the North pond, as an overlapping water right.

Three other permits associated with the Lot 7 properties (47-7358, 47-7968 and 47-8070) were advertised without protest but are constrained from further processing due to the Banbury Hot Springs Ground Water Management Area moratorium.

Conditions

The measuring device requirement was removed by order with the provision that the rate could be determined by the examiner. The rates measured by examiner T Blau are the basis for most of the licensed rates.

The other permit conditions have been met.