

MEMORANDUM

TO: File 45-7686 and 45-13411

FROM: Daniel Nelson – Staff Hydrologist

DATE: September 15, 2016

SUBJECT: Licensing Review for 45-7686 and 45-13411

Various Department staff have attempted to license these two water rights in the past, but were unable to determine how best to license these two rights. These two rights are used separately, but it was determined in the Snake River Basin Adjudication (SRBA) that the City of Burley's wells are all connected together. This has been partially confirmed in the field exam for permit 45-7686 and in conversations with City of Burley staff. From my understanding, the wells are connected together for emergency purposes for fire protection needs and back up to the culinary system if needed.

The City's wells are divided into two subsystems: irrigation wells and culinary wells. Permit 45-7686 was filed to add a new irrigation well into the system, and permit 45-13411 was filed to add a new well into the culinary system. One of the culinary wells was changed to an irrigation well when the new well under 45-13411 was developed. Therefore, some of the diversion rates developed by the 45-13411 well are already covered by the existing water rights.

Water Use:

Both of these permits were filed as a municipal use. However, permit 45-7686 was filed to add a well for the irrigation system and 45-13411 was filed to add a new well to the culinary system. This made it difficult for staff to determine if an additional increment of beneficial use had been developed by these two water right filings. The City of Burley supplied calculations that describe the needs of the City, but some of those calculations were confusing to staff. After review of the information supplied by the City of Burley, Department staff determined that these two permits did not provide an additional increment of beneficial use to the municipal use for the City of Burley.

The City of Burley tried to incorporate information from the City of Draper Master Plan into their calculations for the instantaneous water flow information, but the Department's engineer determined that the City of Draper Master Plan was developed for a larger population base in a different climate zone with an entirely different water distribution design system. Therefore we were not able to use this information.

The Department worked with the information supplied by the City of Burley to determine the flow rates beneficially used from their system. Please see the attached spreadsheet that shows the calculations used to determine beneficial use. After reviewing the calculations, it was determined that the City of Burley had not developed an additional increment of municipal beneficial use under these permits, but they did develop additional capacity for fire flows or fire protection. **Therefore, these two permits should be amended to change the use from municipal to fire protection.**

Diversion Rate:

The diversion rate for this system was difficult to determine, since they use the 18 wells in their system for different purposes. Fortunately, all of the wells have been measured either by a Department field examiner or through the Water District. A total system capacity of 36.43 cfs has been developed in this system. The total municipal use diverted by this system is 26.11 cfs, and the existing municipal water rights for the City of Burley allow up to 31.82 cfs. Therefore, we can only allow the difference between the system capacity minus the existing water rights or 4.61 cfs to be licensed for fire protection.

Permit 45-7686 was measured by a Department Field examiner that showed the capacity of the well developed by this water right as 0.54 cfs. We can license all of the additional capacity developed under 45-7686 for fire protection.

The field examiner for permit 45-13411 did not measure the new well developed under the permit at the time of the field exam, but Water District has measured the well at a capacity well over the 7.80 cfs requested in the permit. This well did replace an older culinary well, so a portion of the older well capacity must be reduced from the capacity of this well. With the municipal use already fully covered, this well can only be licensed for the additional capacity it developed. To determine the amount of water that can be licensed for this water right, we needed to subtract the diversion rate allowed by water right 45-7686 of 0.54 cfs from the difference of the system capacity compared to the existing water rights of 4.61 cfs to come up with a diversion rate of 4.07 cfs that can be licensed. Therefore, I recommend that this permit be licensed for 4.07 cfs for fire protection.

Diversion Volume:

There is no limit to the amount of water that can be used to fight an existing fire. Therefore, this permit will not have any volume limitation.

Points of Diversion:

There are 18 wells within the City of Burley water system. All 18 wells will be included on the license. These wells have had 3 separate names over the years, so I included all of the names in the spatial data in Arcmap and in the workflow database. There shouldn't be any questions on the number or name for each well. All of the wells have been GPS'ed and are included in the WMIS database.

Place of Use:

There is no place of use for either of these two water rights. A condition will be added to state that the place of use is within the service area of the City of Burley Water System. I originally tried to create a Large Place Of Use shape file in our database, but the computer would not let me use that function. I discussed this issue with administration, and it was decided that it would be best to not have any place of use designated on the license. The reasoning behind this decision is as follows:

- There is really no need to have a place of use for fire protection, since a water right is not actually needed to fight an existing fire.
- If we use the current City of Boise service area as the boundary for the fire protection, then the community growth could be limited, since the place of use for the fire protection could not be changed as easily as the service area for the municipal water rights.
- The only real limiter to this fire protection water right is the City of Burley water system, therefore, if the water system changes, then the fire protection should change with it to make sure they have adequate coverage.
- The only concern is that there will not be a place of use that shows up in our mapping database, but there really isn't a need to show a fire protection right in a mapping database anyway. This was resolved with a remark in the database explaining why there is no place of use for this water right.

Removing the place of use from our database has been approved, so we are moving forward without a place of use.

Conditions:

The conditions have been changed to the standard fire protection conditions. The older permit, 45-7686, has the trust water condition and the newer permit, 45-13411, doesn't have the trust water condition. I will discuss this and other conditions with administration before sending out the amendments for this permit.

Revised Well Review

Total Gallons Pumped 2008	Number of Days Pumped	Average Gallons Per Day 2008	Average Gallons Per Minute 2008	2012 Gallons Per Capita Per Day (GPCD) Average Annual Day	2012 Gallons Per Capita Per Day (GPCD) Peak Hour	2008 Peak gpm using ratio from Burley Master Plan
1,036,988,000	365	2,841,063	1973.0	292	948	6,405

Irrigation Use in gpm =	5,313	11.84
Culinary Use in gpm =	6,405	14.27
Total =	11,718	26.11 cfs
Fire Flows in gpm =	4,500	10.03 cfs
Grand Total =	16218.4	36.14 cfs

The 2008 Peak gpm was determined by using the 2015 Burley Water Master Plan calculations shown on Page 2. I used a ratio of the average gallons per day of 292 and peak hour gallons per day of 948 (948/292 = 3.25 peaking factor) to convert the average gpm for 2008 to peak gpm. This determined a flow rate of 6,405 peak gpm for 2008.

When you add up the 2008 irrigation gpm and the peak hour culinary gpm you have a diversion rate of 26.11 cfs. If you add in the fire flow requirement of 10.03 cfs, then the total diversion rate is 36.14 cfs, which matches the system capacity that has been measured of 36.4 cfs.

Culinary Measured Flows By Water District

Well	Measured Flow Rate in GPM	Notes
Culinary 1	0.0	No longer in use per field exam
Culinary 2	1274.6	
Culinary 3	1052.8	
Culinary 4	1109.6	
Culinary 5	1950.6	
Culinary 6	2150.0	
Culinary 7	3500.6	Measured in WMIS Data as 7.80 cfs
Totals	11038.2	

Irrigation Capacity =	11.84 cfs
Culinary Capacity =	24.59 cfs
TOTAL System Capacity =	36.43 cfs

Culinary Capacity Covered to cfs = 24.59 cfs

Irrigation Measured Flows

Irrigation Well	Site Tag #	Flow Rate in GPM
Almo Well	A0002613	521
Pump House #2	E0007518	414
N. Park Well	A0007808	435
Pump House #1	A0002618	286
Hogan Well	A0002617	693
Keller Well	A0002616	393
Fairgrounds Well	A0002619	207
Snow Well	A0007807	626
Carlson Well	A0002614	570
Drake Well	A0007810	482
Larson Well	A0007809	271
Salmon Park Well	A0002615	415
Total		5313

Note:

IDWR would typically prefer to issue a license based on Max Day Demand (MDD) for municipalities with sufficient storage, like City of Burley. In this case, IDWR personnel believes there is evidence that the culinary system is run near capacity in order to fill storage reservoirs.

Irrigation Capacity covered to cfs = 11.84 cfs

Water Right	Water Right Diversion Rate in cfs	Cumulative Flow Rates
36-4080	0.91	0.91
45-4089	1.23	2.14
45-4090	2.01	4.15
45-4091	1.72	5.87
45-4092	1.34	7.21
45-4093	2.00	9.21
45-4094	1.66	10.87
45-4095	1.11	11.98
45-4096	1.34	13.32
45-4097	0.89	14.21
45-4098	2.67	16.88
45-4099	2.67	19.55
45-7269	3.56	23.11
45-7436	0.69	23.80
45-11133	0.89	24.69
45-13895	0.89	25.58
45-14083	1.34	26.92
45-14190	0.44	27.36
45-7735	4.46	31.82
45-7686	0.54	32.36
45-13411	7.80	40.16
TOTAL	40.16	

The existing water rights allow 31.82 cfs to be diverted into this system. The analysis on the system suggests that only 26.11 cfs is needed to adequately supply this system. The remaining water is used for fire protection or fire flows. The system capacity is 36.4 cfs, which will cover the fire flow needs for the City of Burley. Permits 45-7686 and 45-13411 requested to add an additional 8.34 cfs into the system that is not needed for municipal purposes, but are needed to ensure the City of Burley has the proper fire flows for their system. Therefore, permits 45-7686 and 45-13411 should be amended to a fire protection use. The permits should also be limited to the system capacity of 36.43 cfs. Therefore, permit 45-7686 should be licensed for 0.54 cfs and permit 45-13411 should be limited to 4.07 cfs.

System Capacity =	36.43 cfs
Existing Rights allow =	31.82 cfs
Rate Allowed by Permit 45-7686 =	0.54 cfs
Amount Available for 45-13411 =	4.07 cfs

This diversion rate is the amount of water already licensed or decreed in SRBA.

This permit limited by field exam measurement

The well developed by this permit has a capacity of 7.80 cfs per WMIS data