

MEMORANDUM



TO: Tim Luke
FROM: Dale Cunnington
DATE: February 18, 2016
RE: Bannock Creek Basin 2015 Accounting of Diversions

This year I have limited my review of the 2015 accounting of Bannock Creek basin diversions to the 18 groundwater irrigation rights that are protected under provisions of Tribal groundwater right 29-12052. Table 1 at the end of this memorandum lists those 18 protected irrigation rights and shows a comparison of decreed diversions to the IDWR measured/estimated diversions of 2014 and 2015 and to theoretical calculated diversions based on crop water requirements determined by Dave Shaw. The table also has comments regarding whether the rights were irrigated in 2015 based on a field trip made by DOWL personnel in July 2015 in which Places of Use of the protected irrigation rights were inspected for irrigation from observations made while driving by on nearby public roads. Table 2 estimates the unit diversion per acre for these 18 protected irrigation rights.

Based on the compilation of these tables, I have the following questions:

A. Rights in General

1. Are the meter readings shown on the accounting spreadsheet manually read during the indicated weeks? **Only on the weeks where an actual meter reading value is displayed (0 was inserted in a few specific weeks where meter readings did not change between visits – those weeks probably should have been left null.**
2. How often are meter readings supposed to be read? I notice no meter readings are shown in weeks 7 through 11. **There is no specific policy or requirement. In most water districts where meters are installed on ground water diversions, IDWR encourages districts to read meters monthly if resources or budgets permit. Otherwise, meters should be read two to three times per year. In water districts that focus on delivery of surface water diversions, IDWR encourages districts to measure the diversions at least weekly or more frequently depending on delivery calls and if supplies or diversions are changing frequently. (Water Master) Readings in most cases are taken weekly unless from weather or farming practices the water users have pumps shut off. If most of the pumps are off I may skip visiting the pumping sites.**
3. Most of the 18 protected rights have unit diversions in 2015 that run roughly around only 1 AF/ac (see Table 2 in back), which is much less than the 2-3 AF/ac expected. Do you have any guesses why these diversions are so low? **(Water Master) There are a number of reasons that usage could be low. Because of sufficient soil moisture in spring they may start later, rains can be another reason they are low, crop harvesting, if soil moisture is adequate a pump on some farms may be off for two to three weeks, lack of sufficient water to run pumps for an extended period of time, soil type and terrain, pumping costs, the cost of additional sprinkler systems has limited their usage,**

expansion is in future plans but the budget is not there yet. These water users don't just turn their pumps on and pump water because some one expects them to use more.

T Luke: As I have mentioned to you before, based on some of my review and field inspection of the water rights places of use in 2013, only a portion of the full water right acres are actually irrigated in many cases. A use of 1 AF/acre may be reasonable if only one-quarter to one-third of the acres are irrigated.

B. Specific rights

1. 29-2470:

- a. The measured volume of 121.9 AF for 2015 is only a small fraction of the theoretical volume based on crop water requirement of 790 AFA. While part of this difference may be due to the malfunction in the flow meter for 3 weeks, a comment in the 2014 accounting indicated the flow meter multiplier needed verification. Was the flow meter multiplier verified in 2015? As per 2015 aerial imagery, it looks like only 128 acres were farmed or irrigated – and it appears to be a grain crop. (Water Master) Flow meter multiplier was verified or confirmed after the 2014 irrigation season – the multiplier is 1,000. Anderson has 1 pivot. Expansion of irrigation system may be in the works for additional irrigation acres. Jacob has been irrigating and the Evans forfeiture law suit may stop irrigation completely if Evans wins in court.

2. 29-2565:

- a. A comment in the accounting for Week 1 for this right indicates “Pump not in use— (4 years out of CRP)”. Does this comment mean that the right has been in the CRP for four years, or that it has been 4 years since the right was taken out of the CRP program? (Water Master) Out means out, the ground was taken OUT of the CRP program four years ago. My understanding is that there are plans to begin irrigation in the future.
- b. Right 29-2565 is used in conjunction with rights 29-477 (a trans-basin ditch from Rattlesnake Creek), 29-10857 (a spring), and 29-13234 (a storage pond from the spring and Rattlesnake Ditch) to irrigate a combined 409 acres:
 - 1) The 2015 accounting has a line for rights 29-477 and 29-13234, but no line for 29-10857. Is this spring flow for 29-10857 measured by IDWR? (Water Master) No. Dale – I responded to this same question last year. Please see my responses to your memo dated 2/25/2015 (tluke)
 - 2) The 2015 accounting apparently measures the trans-basin ditch from Rattlesnake Creek for the combined flow of the multiple users. Are there any measurements to show what portion of the total ditch flow goes to each of the users? (Water Master) No. this is a private ditch and IDWR regulation of split ends at the point of diversion from the creek. IDWR/watermaster measures total diversion to ditch from creek at head of ditch; watermaster does not go down the ditch to measure and regulate splits.
 - 3) The above 4 rights were split due to a change in ownership in July 2015 whereby Dale Bolingbroke retained 333.2 acres of the 409 acres and Robert & Rhonda Bodlak obtained 75.8 acres (see Bodlak rights 29-14164 through 29-14167). Are

there plans to measure what portions of the well, spring, and storage right flow will go to each owner, or will the measurements continue to be for both owners combined? (Water Master) When the well comes back into operation a measuring device will be installed, it will be one measurement or measuring device on the well for all the rights diverted from the well. There will be no change in measuring and reporting of Rattlesnake Creek diversion. Refer to last year's response to you regarding the spring which is not measured.

3. 29-7272 and 29-7110

- a. The accounting spreadsheet has well rights 29-7272 and 29-7110 on the same line, and indicates the measurement is made via a Parshall Flume.
 - 1) Are wells 29-7272 and 29-7110 two separate but nearby wells, or are they the same well? (Water Master and T Luke) The two water rights are diverted from the same well – we addressed this same question from you last year. Water diverted from the well is measured by the Parshall Flume. Water discharged from well and through the flume can be re-diverted at two different points.
 - 2) If they are separate wells, does the flume measure the combined flow of both wells 29-7272 and 29-7110? NA – see prior response.
 - 3) What type of measurement device is on the Parshall flume. Is there a continuous recorder, or are manual flow measurements taken using a staff gage at certain intervals? How often are manual measurements taken? (Water Master) Manual flow measurements with a staff gage, weekly when running.
- b. Right 29-7272 has combined use limits with ground water right 29-2509 and surface water rights 29-480, 29-13215, and 29-13522. In the accounting, I can find lines for 29-2509 and 29-13215. Does the line for 29-13215 contain the combined flow for rights 29-480, 29-13215, and 29-13522? Is so, it should be labeled as all 3 rights. Yes – this diversion serves the three rights you list plus it is a point of re-diversion for ground water rights 29-7272 and 29-2509. This was correctly labeled in the 2014 report but not copied over to the 2015 report. I have updated the report to be consistent with 2014.
- c. I notice that the total flow volume for 29-7272/29-7110 on the 2014 and 2015 accounting is the same calculation of 1.36 AF, based on 0.15 cfs over 4.58 days. In the 2014 accounting, all weeks are 0 or pump off except week 10 which shows 0.15 cfs. In the 2015, all weeks are shown as 0. (Water Master) Correct. The 2015 report sent to you was in error – the 1.36 AF in 2015 was inadvertently carried over from 2014 report. The 2015 report has been updated to show 0 AF use in 2015 for this well.
 - 1) Is the 2015 accounting total use supposed to be 0 (as indicated by the no use comment in the last column of the 2015 accounting) or 1.36 AF? (Water Master) The correct volume for 2015 is “0”. The well was not used in 2015.
 - 2) Is the 1.36 AFA an estimate, and if so, how were the pumping dates and hours estimated? (Water Master) No use in 2015. Water user contacts me and lets me

know if he plans to use the well. The watermaster visited this well periodically throughout the season and verified no use.

- d. Right 29-7110 is for irrigation of 5 acres adjacent to the well, while right 29-7272 is for well water injected into Clifton Creek which is re-diverted out of Clifton Creek several miles downstream for a combined 120.3 irrigated acres from surface and groundwater along Rattlesnake Creek. Is there any way to separate the measurement of water from each well 29-7110 and 29-7272 (there is only one well), or if not, is there a way to determine from the total water pumped from both 29-7110 and 29-7272 that portion which was used on the adjacent 5 acre tract and that portion which was injected into Clifton Creek for use by the 120 acres downstream on Rattlesnake Creek? (Water Master) 29-7272, if used for the 5 acre tract, will be an estimate based on nozzle size, pressure and days irrigated. 29-7110, if used, is measured through Parshall Flume. The five acres were not irrigated in 2015 as per my visits and knowledge.
- e. The Place of Use of 29-7272 and 29-2509 is also part of the Place of Use of unprotected well right 29-7949 via this well injecting flow into Clifton Creek and re-diverting the flow back out downstream on Rattlesnake Creek into the 29-7272/2509 Place of Use. A note on the 2015 accounting in the comment column indicates well 29-7949 flow normally diverts into pressurized pipelines (which serve two irrigated tracts of land adjacent to the well to the NE and NW) and rarely goes to Clifton Creek. Is there a way to measure if any flow from well 29-7949 is being injected into Clifton Creek, and if so, was any flow injected in 2015? (Water Master) The well authorized by 29-7949 is called the Box Car Well (Location C on diagram sent to you last year). This well does not inject to Clifton Creek and is not re-diverted downstream on Rattlesnake Creek even though the water right authorizes such injection and re-diversion. The well does not have a separate pipe or valve that open discharges to Clifton Creek. Additional work would have to be done on system to inject to Clifton Creek. No flow or water was injected to the creek from this well in 2015.
4. 29-7291
- a. This right is listed twice on two lines in the accounting with unprotected adjacent groundwater right 29-7931A. One line indicates the well is the "Home Place", is in use, and has a 1305.2 AFA limit (associated with 29-7291). The other line indicates the well is the West Well (unused—orig PD 29-7291), is not in use, and has a 7.85 cfs limit (associated with 29-7931A).
- 1) What is the location of the "Home Place Well" (which is in use) and the location "West Well" (which is not in use)? The water right report and maps show one well diversion point for 29-7931A that lies in NWNWSW sec.36, T11S,R33E and two well diversion points for 29-7291 that lie in the NWSW, sec.35, T11S,R33E. I'm trying to determine which of the diversions points the Home Place Well and the West Well belong to. Right 29-7291 does list two wells in the NWSW of Sec 35 11S 33E but there is actually only one well in this location. It is my understanding that the original well in this 40 acre parcel went dry or caved in

and has since been abandoned. A second well was drilled in the same 40 acre tract (in the NWNWSW Sec 35 and located along the road near the edge of a large pivot in the SW1/4 of Sec 35). This second well is not used and has no pump. It is my understanding that this second well went dry or yielded very little water and therefore is no longer used. The Home Place well is located in the NWNWSW of Sec 36, 11S 33E at or very near the intersection of two roads. This well is used with a diesel pump to irrigate the place of use under right 29-7291 – there are 3 pivots for 29-7291 – two large and one mini. The well can be used to irrigate the place of use for permit 29-7931A but very little or none of the POU under permit 29-7931A is currently irrigated. Please refer to my response last year for further information about these rights and wells.

- 2) Does the Home Place Well supply water to the Place of Use of both 29-7291 and 29-7931A? **Yes.** Does the West Well supply water to the Place of Use of both 29-7291 and 29-7931A? **No – see response above and refer to my response sent to you last year for further information.**
- 3) If the Home Place Well supplies water to only one right and the West Well supplies water only to the other right, why are the two rights listed together in the accounting instead of on separate lines? Do the Home Place and West Well have a combined flow common measuring point? **(Water Master) West well not in use. Please see response to above question and refer to my response last year for further information.**

5. 29-10549

- a. The flow for this right was estimated because it is not on the measurement order due its small irrigation size. The IDWR estimate (based on number of sprinklers, gpm/nozzle, and days of use) seems a reasonable approach but may be high, as it works out to 13.9 AF/ac (see Table 2) which seems excessive. Did the number of sprinkler nozzels, gpm/nozzle, and hours/days/weeks of operation come from the water user or was it just estimated by IDWR? **(Water Master) Data came from water user and estimated by water master. I agree the estimate is too high. I suspect the system does not run all 63 nozzles at one time but instead runs on zones. We do not have enough information about the operation of the irrigation system to make a reasonable estimate so we removed the estimate from the report. See revised report attached. We recommend using your original estimate. This well and right was not subject to measuring device order since the total water right acres = 1.**

6. 29-13709

- a. The flow for this right was estimated because it is not on the measurement order due its small irrigation size. The IDWR estimate (based on number of sprinklers, gpm/nozzle, and days of use) seems a reasonable approach but may be high, as it works out to 38.5 AF/ac (see Table 2) which seems excessive. Did the number of sprinkler nozzels, gpm/nozzle, and hours/days/weeks of operation come from the water user or was it just estimated by IDWR? **(Water Master) Data came from water user and estimated by water master. I agree the estimate is too high. I suspect the system does not run all 154 nozzles at one time but instead runs on zones. We do not have enough information about the operation of the irrigation system to make a**

reasonable estimate so we removed the estimate from the report. See revised report attached. We recommend using your original estimate. This well and right was not subject to measuring device order since the total water right acres = 3.5.

If you have any questions, please contact me.

Table 1. Comparison of the Groundwater Irrigation Rights Protected by Provisions of Tribal Right 29-12052

Wtr Rt #	Decreed Acres	Decreed Vol, AFA	Calc. Div. Req'd, AFA	Reduced Calc Div Req'd, AFA	2014 Measured AFA	2014 IDWR Comment	2015 Measured AFA	2015 IDWR Comment	Determination of Irrigation from 2015 DOWL Field Trip	DOWL Comment
29-2458A	87.0	348.0	243	243	103	Measured	104.6	Measured full year	All irr., approx. 50% oats/50%alfalfa	
29-2470	283.0	1407.0	790	790	82.5	Verify meter multiplier.	121.9	Flow meter not working up to 3 weeks	Irrigated, NE pt=spring grain, NW pt =sub irr., south=alfalfa,	Incomplete pump records due to meter malfunction
29-2509	Included	in 29-7272			0	No use in 2014	0	No use in 2015. No motor or meter	See 29-7272	POU of 29-2509 within POU of 29- 7272.
29-2565	409.0 combined	505.4	1141	659	0	Pump not in use	0	Pump not in use	Only small pt of 409 ac POU along Rattlesnake Ditch clearly irrigated	GW right combined with SW rights 29-477,10857,& 13234. Assume no GW used
29-4349	91.2	365.0	254	254	80.7	Meas. & est. data.	100.6	Measured full year	All irr. alfalfa	
29-7110	5.0	20.0	14	14	Included w/ 29-7272		Included w/ 29-7272		All irr. grass	IDWR has well 29-7110 meas. with well 29-7272. Are these the same well?
29-7272	120.3 combined	408.0 combined (29-2509 & 7272)	336	226	1.36	Pumped 110 hr (4.58days) @.15cfs flume meas.	1.36	Pumped 110 hr (4.58days) @.15cfs flume meas.	All irr. except.N. pt. Est irr=67 ac POU of 29-2509, grain	Combined ac & cfs limits with GW 29-2509 & 7272, and SW 29-480,13215 & 13522. Where are 29-480 & 13522 meas?
29-7291	326.3	1305.2	910	910	440.2	Listed twice w/unprotected right 29-7931A. Home place well in use, west well no use.	442.9	Listed twice w/unprotected right 29-7931A. Home place well in use, west well no use.	All irr: 2 N. pivots=irr alfalfa, S. pivot = potatoes	IDWR combines meas with adjacent unprotected well right 29-7931A. Unclear which well is being used & if both rights used.
29-7630	149.0	520.0	416	416	1.4	Well on 1 day, vol est.	0	No meter, not irrigating in 2015	Not irr., not farmed	
29-10549	1.0	5.2	3	3	Not meas.	Less than 5ac.	13.9	Estimated use	All irr. in grass	2015 use over estimated by IDWR
29-13708	154.7	619.0	432	432	0	No use --in Water Bank until 2016	152.7	Measured full year. Pump records show pivots installation starting in late Apr.	In process of shifting acres per 2015 transfer. Mostly irr. with alfalfa & perhaps grain	Right pulled from water bank in May 2015. Assume irr. is per 2015 transfer with N.71.7 ac pivot in alfalfa and S.83 acre pivot = 50%alfalfa and 50%grain?. Irr. only part of year.
29-13709	3.5	14.0	10	10	Not in accting.	Not in 2014 accting.	134.8	Estimated use	All irr. grass.	2015 use over estimated by IDWR
29-13949	346.8 total combined	1369.8 total combined	968	968	495.8	West pump/GW	347.1	Measured full year. West pump/GW	All irr. potatoes	Total acres 29-13949, 13950, 13951,13952,13985=346.8 , Total vol =1369.8
29-13950	Included	in29-13949				Included in 29-13949			All irr. grain	
29-13951	Included	in29-13949				Included in 29-13949			All irr. grain	
29-13952	Included	in29-13949				Included in 29-13949			POU = 29-13950	
29-13984	281.2	984.2	785	785	508.6	East pump/GW	590.5	Meas. full yr. E.pump	All irr. grain	
29-13985	Included	in29-13949				Included in 29-13949			POU=29-13950	
Total	2258.0	7870.8	6300	5708	1713.56		2010.36			

Notes:

1. Acres and decreed volume taken from water right reports on the IDWR web site
2. The calculated diversion requirement is a theoretical value based on a 5 year crop mix resulting in a water requirement of 595.3 mm and 70% irrigation efficiency as described in a May 27,2014 email from Dave Shaw to the Fort Hall Technical Team. The resulting unit diversion requirement can be calculated as follows:

$$\text{Diversion required} = 595.3\text{mm} / (25.4\text{mm/in} \times 12\text{in/ft} \times 70\% \text{ eff}) = 2.7901 \text{ AFA/ac}$$
3. The reduced calculated diversion requirement reflects an estimated reduction of 482 AFA for 29-2565 and 110 AFA for 29-2509 and 29-7272 to account for overlap of surface water rights, as described and calculated in a Dave Shaw May 29,2014 email.
4. Dave Shaw's May 27,2014 email originally calculated a theoretical total diversion requirement of 6479 AFA for 2322 irrigated acres before the reduction adjustment for overlap in surface water rights. These amounts have been modified in the above table to reflect the following changes in rights based on recent approved transfers:
 - a. Right 29-2458A now reflects a 2014 transfer which changed the right from 151 acres and 620 AFA to 87 acres and 348 AFA. This changed the theoretical required diversion requirement before reduction from 421 AFA to 243 AFA.
 - b. Right 29-13708 now reflects a 2013 transfer which changed the decreed volume from 631.9 AFA to 619 AFA. The acreage and hence theoretical diversion requirement did not change.
5. In the above table:
 - a. Rights 29-2509 & 7272 have been combined since they have a combined acreage limit
 - b. Rights 29-7110 & 7272 have been combined since they may have a common measuring point
 - c. Rights 29-13949, 13950, 13951, 13952, 13985 have been combined because they share a common diversion point

Table 2. Estimated 2015 Unit Diversion in AF/Ac

Wtr Rt #	Decreed Acres	2015 Est. Ac Irrigated by GW	2015 Div. Vol, AF	2015 Unit Div. Vol= 2015 Div. Vol / 2015 Ac	Comment
29-2458A	87.0	87	104.6	1.20	
29-2470	283.0	283	121.9	0.43	
29-2509	Included	in 29-7272			
29-2565	409.0 combined	None	0	0	
29-4349	91.2	91.2	100.6	1.10	
29-7110	5.0	5	1.36	0.27	Assume measurement for 29-7110/7272 all goes to 29-7110
29-7272	120.3 combined	67 est.	0	0	Assume measurement for 29-7110/7272 all goes to 29-7110
29-7291	326.3	326.3	442.9	1.36	
29-7630	149.0	0	0	0	
29-10549	1.0	1	13.9	13.9	IDWR 2015 estimated volume may be high
29-13708	154.7	154.7	152.7	0.99	
29-13709	3.5	3.5	134.8	38.5	IDWR 2015 estimated volume may be high
29-13949	346.8	346.8	347.1	1.00	356.8 = total ac of 29-13949, 13950, 13951, 29-13952, 13985
29-13950	Included	In 29-13949			
29-13951	Included	In 29-13949			
29-13952	Included	In 29-13949			
29-13984	281.2	281.2	590.5	2.10	
29-13985	Included	In 29-13949			