



State of Idaho

DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720-9000

Phone: (208) 327-7900 FAX: (208) 327-7866

September 15, 1995

Howard Hall
McCammon Ditch Co.
McCammon, ID

PHILIP E. BATT
GOVERNOR

KARL J. DREHER
DIRECTOR

Re: Parshall Flume Measurements & Calibrations

Dear Mr. Hall:

In a discussion with you last spring concerning water deliveries and certain measuring devices on the Portneuf River, I agreed that I would make a field visit to the area during the summer to calibrate the large Parshall flumes owned by McCammon Ditch Company and Portneuf-Marsh Valley Canal Co. I made separate visits to the area on August 10-11, and August 17. Arlin Olson accompanied and assisted me with measurement of the McCammon Ditch on August 11. Tony Olenichak, staff hydrologist with Water District 01 and IDWR in Idaho Falls, assisted with the measurement of the PMV canal and reservoir outflow on August 17. A summary of the measurements is provided below.

Date/ Time	IDWR Measurement Location	Parshall Flume GH/Flow	IDWR Measured Flow	Percent Error of Flume
8/10 7:30 pm	Portneuf River, reservoir outlet about 200 ft. below 10 ft. Parshall flume	1.70 ft. 92.0 cfs	84.4 cfs	+ 9.0%
8/11 12:15 pm	McCammon Ditch about 75 ft. below ditch headgate	1.07 ft. 43.9 cfs	41.8 cfs	+ 5.0%
8/17 9:20 am	PMV Canal below head- gate at RR bridge (near Hwy 30 bridge)	1.79 ft. 146.7 cfs	135.1 cfs	+ 8.6%
8/17 11:20 am	Portneuf River reservoir outlet 200 ft. below flume	1.70 ft. 92.0 cfs	84.3 cfs	+ 9.1%

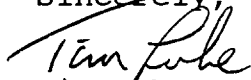
Measurements of 8/10 and 8/11 were made by wading method with a Swoffer 2100 propeller meter. Measurement of 8/17 near the reservoir was made by wading method with a Price AA meter. The 8/17 measurement of the PMV canal was made using a Price AA meter with suspension cable.

Because of ditch conditions, current meter measurements of McCammon and PMV canals could not be made at a locations immediately above or below the Parshall flumes. Percent error calculations in the above table may be inaccurate if canal gains or losses occur between IDWR measured locations and Parshall flume locations. Using the USGS adopted criteria for classifying accuracy of discharge measurements, calibration measurements within 5 and 10 percent may be respectively classified as excellent and good.

Based on the above measurements, both PMV Parshall flumes may be measuring flows about 9 percent above actual flow. This observation assumes that the current meter measurements represent actual flow (current meter measurements also contain some error). If both flumes consistently over-measure at rates close to +9 percent, then the errors at both flumes largely cross each other out. However, since the flow rates are different at the two locations (due to delivery of both PMV and Arimo water at the PMV canal), a +9 percent error at the PMV canal flume may result in several additional cfs being delivered to the canal. This difference does not appear to be significant enough to warrant management changes. Adjusting deliveries based on potential measuring device errors should not be made unless justified by additional calibration measurements. Further calibration of the PMV and McCammon flumes should include current meter measurements closer to the flumes.

I also wish to advise that during my field visits, I spent a considerable amount of time looking for water level fluctuations in the 10 ft. PMV Parshall flume below the reservoir. As you have reported, I agree that fluctuations do occur. When reading the 1.70 ft. gage height on both 8/10 and 8/17, I noticed that the water level fluctuated at most, between 1.68 and 1.72 feet, a difference of less than 4 cfs. The high and low fluctuations appeared to be brief. The most consistent water level reading during my visits appeared to be at 1.70 ft., which is in the middle of the high-low fluctuations. Arlin Olson also read the staff gage at 1.70 feet. I feel confident that Arlin is very careful and fair in how he reads this gage and records flow at this measuring device. I observed Arlin using the installed staff gages at this and other flumes. I did not see Arlin using a wire to record water levels but instead observed that he used a standard steel staff gage to check the water levels and gages at all the flumes. I remind you that PMV installed a new staff gage and walk bridge at the flume near the reservoir to assist Arlin in reading the gage at this device. There is no need for Arlin to use a steel wire at this site as he has done in the past. I believe there is no merit in any continued suggestion that Arlin is not doing the best he can to accurately read and report water levels.

Sincerely,


Tim Luke

cc: Ervin Gilbert, PMV
Arlin Olson, Watermaster
Roger Johnson, Portneuf Irrigation Co.
Tony Olenichak, IDWR Eastern Region