State of Idaho
DEPARTMENT OF WATER RESOURCES
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RECEIVED
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Department of Water Resources

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June 11, 1997

Dave Sundberg
PO Box 1
Malta, ID 83342

Jeff Sessions
HC 72 Box 2346
Malta, ID 83342

Cora Lee Kempton
HC 72
Malta, ID 83342

RE: Clear Creek

Dear Waterusers:

This office received a call from Mr. Jeff Sessions expressing his concern about the delivery of water on Clear Creek. Additionally Mrs. Kempton requested our office to respond to certain items. This letter is intended to keep all parties informed of our office's investigation and responses.

On June 3rd I received a phone call from Mr. Sessions expressing his concern about three issues of delivery of water to his ranch and on the creek which he wanted our office to investigate. The three issues are summarized as follows:

-He was first concerned about getting a smaller flow than what may have been delivered him in previous years. He wanted to know exactly what was being delivered as per my April 15th letter to Mr. Sundberg.

-He was concerned about Ray Jones being delivered Arimo's water.

-He was concerned about water being delivered to Jones's upper ranch through a diversion at or near the Idaho Weir. The diversion was reported not to have a measuring device.

On June 4th I contacted Mr. Sundberg by phone and asked for him to meet me the next day to review the delivery of the rights on Clear Creek. On June 5th Gary Funderburg and I met Mr. Sundberg at the Idaho Weir to discuss the delivery of the Clear Creek water. During our review that day we visited all the diversions or measuring devices which he uses to distribute the water. On that day he indicated he was then delivering 110% of the full water right decrees to all Idaho waterusers based on the information he had available to him. Gary and I with the assistance of Mr. Sundberg spot checked some of the weir measurements using a Swoffer digital meter and wading rod. The attached table summarizes these measurements and observations.

While in the area at the request of Mr. Sundberg we also measured

Clear Creek near the site of the old USGS gauge in Utah. The weir plate at this site had been removed due to high flows so no measurements could be taken. I understand the Utah commissioner compiles the Utah total deliveries by adding measurements from all the weirs in Utah. We measured 89.8 cfs by using the Swoffer meter and wading rod at this site. We observed 0.80' on the 3' Cipolletti weir at Sundberg's upper diversion (7.18 cfs) above the USGS gauge site. Also we observed from the road to the public campground water being diverted to the Schofield place above the USGS site. I estimate the Schofield flow was in the 2 to 4 cfs range. Based on these observations it is estimated that the total flow for Clear Creek at the gauge would be around 100 cfs if not diverted above. Based our measurement of Hoskins weir, Jones-Sessions weir and the Idaho Weir, Idaho's total was 57 cfs. Thus, Idaho was getting 57% of the flow and Utah 43% which matches the Johnson decree dictated split ratio of 57% to Idaho and 43% to Utah.

Based on our observations of the delivery in Idaho it appears that the watermaster is very conscientious in attempting to deliver the water according to the May 15th, 1996 "Order Providing for Preliminary Injunctive Relief" signed by Judge Hurlbutt. The obvious reason for not completely achieving his goal is the poor condition of many of the measuring devices he relies on in distributing the water.

To specifically address Mr. Sessions concerns:

-Regarding the amount of water being distributed to his ranch, it appears that the watermaster is delivering the rights according to the Hurlbutt order. It appears that Mr. Sundberg was attempting to deliver 110% of 245" or approximately 5.39 cfs. By his calculations there was 4.97 cfs being delivered. Our measurement of the Sessions' weir found that due to the condition of the weir it inflates the reading by approximately 41%. To rectify this situation for this season the watermaster should adjust the deliveries accordingly and also try to make up the shortfall.

-Regarding the concern about Jones using Arimo's water, I reviewed this matter with the watermaster and found that at the request of Jones and Arimo, he has allowed them to rotate streams. Early in the season to get Jones's ditch filled up he has allowed Arimo's water to be added to Jone's stream. I understand that later in the season Jones will be cut back to give back the water to Arimo. This type of rotation does have some basis in practice on other streams in Idaho; normally rotations only occur with users of a common ditch, but in the Basin Creek area portions of the stream are rotated among users with different diversions similar to the Clear Creek rotation situation. To prevent injury there must be a strict accounting of water which I have asked the

watermaster to provide our office. I suggest this rotation scheme be reviewed by the advisory board at the end of the season for future direction to the watermaster.

-Regarding the concern about a ditch diverting near the Idaho weir and used by Mr. Jones for his upper ranch without a measuring device, I found no such ditch diverting from the creek. However, there is a ditch which splits off of the Jones-Sessions ditch which provides water to Jones's upper ranch. Since the watermaster delivers Jones the difference between the measurements from the weir at the head of the Jones-Sessions ditch and the Sessions weir, this water is indirectly being measured.

To specifically address Mrs. Kempton's questions:

-She asked that I describe any conversation or meeting with Kemptons where there was a discussion about "attempting to take away or discontinue Reid Stewart's water right". I do not recall specifically any conversation with any of the Kemptons which could be characterized as an effort to discontinue Mr. Stewart's water right but on 7/27/94 I did talk with Mr. Kempton and wrote the attached memo about our conversation. As the memo indicates, Mr. Kempton indicated that the Gunnel water (Stewart) had not been used for many years and I concluded that there may be issues of forfeiture regarding this right.

-She asked that I send copies of any letters from Pat Brown to Jeff Sessions. I have reviewed my files and find no such letters. I do have numerous motions, letters, etc, which have been sent between Mr. Brown and Mr. Ling who is Mr. Sessions' attorney. Since I no longer have the original files for the Sessions application for permit and transfer application I was not able to check these files. I suggest if there are such letters that Mrs. Kempton contact either Mr. Sessions or Mr. Brown for copies.

-She asked for a copy of the place of use for the Jobe Adams decree. With her copy of this letter, please find attached a copy of the Jobe Adams decree for Clear Creek which provides a place of use listing of the rights.

With regards to the matters which have been investigated, I make the following specific recommendations:

-For the remainder of the year the watermaster must immediately adjust his delivery based on the correction factors determined by IDWR measurements. The factors are found in the attached table.

-The waterusers on Clear Creek must plan to upgrade their measuring devices to standard conditions at the end of this season so as to accurately measure the water delivered to their diversions. Please find attached a summary of problems observed at the various weirs. Additionally the water users should seriously consider installing permanent flumes or rated sections at the USGS gaging site in Utah and at the Idaho weir.

-The watermaster and Utah commissioner must continue to adjust the split between Utah and Idaho as the creek rises and falls. If IDWR is requested, we will spot check the split and work with the Utah Department of Natural Resources, the Utah Clear Creek Commissioner and the Idaho Watermaster to assure delivery of the waters as the Johnson decree dictates.

-The watermaster must provide IDWR with a concise record of the rotation that has been implemented.

-The advisory board should provide the watermaster and IDWR with a recommendation regarding the rotation system implemented on the creek.

I again encourage all parties to work together to equitably distribute the water to the rightful owners.

Sincerely,

Allen Merritt, PE
Southern Region Manager

CC:: Vern Kempton
Ray Jones
Jeff Sessions
Pat Brown
Roger Ling
Bob Fotheringham
Jay Harper
Norm Young
Phil Rassier

Weir Name	Weir Type/Size	Weir Reading	Weir (cfs)	IDWR (cfs)	100%	110%	Factor
Hoskins	3′ cip	0.50	3.53	3.63	3.2	3.52	1.03
Idaho				40.97	43.33	47.66	
Jones-Sessions	3′ cip	1.24	14.04	12.45	12.70	13.97	0.87
Sessions	4′ cip***	0.52	4.97	3.52	4.90	5.39	0.71
Stewart	3′ cip	0.90	8.59	Not Meas	8.40	9.24	n/a
Arimo	3′ cip	0.90	8.59	Not Meas	4.80	5.28	n/a
(Jones)			(9.07)*	(8.93)	7.80	8.58	
(Holmgren)			( )**	(23.79)	30.13	33.14	

* = (Jones-Session weir) - (Session weir)

** = ((Idaho weir) - ((Stewart weir) + (Arimo weir)))

*** This weir acts more like a 3′ weir than a 4′ weir as the watermaster delivers; if rated as a 3′ weir the factor is 0.94.

To correct weir readings they should be multiplied by the listed factor to calculate actual amount delivered. A factor for the Idaho weir can be determined but the notes from the watermater for the weir was not copied by IDWR on the day of the measurement.

CLEAR CREEK WEIR PROBLEMS

Hoskins weir: The device is a 3' cipolletti weir, fair condition. Too high velocity of approach, no weir plate, little aeration, no sharp crest.

Idaho weir: The device is a cipolletti weir, poor condition. Too high velocity of approach, no stilling pool above, no aeration, submerged, no sharp crest.

Jones-Sessions: The device is a 3' cipolletti weir, poor condition. Too high of velocity of approach, no stilling pool above, no aeration, submerged, no sharp crest.

Sessions: The device is intended to be a cipolletti weir, the size is between 4' and 3'; the watermaster calls it a 4'. The weir has no weir plate with sharp crest, may be submerged.

Stewart: The device is a 3' cipolletti weir in fair condition. The weir may not have a sharp crest with slightly high approach velocity.

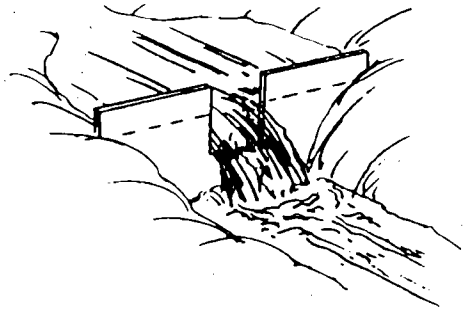
Arimo: The device is 3' cipolletti weir in fair condition. The weir may not have a sharp edge on all sides of the crest, the approach velocity may be high, partially submerged.

**See attached instructions for how to install a weir.

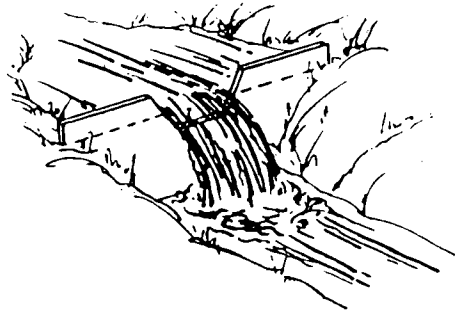
Water is conveyed in both open channels and closed conduits. This bulletin will consider some of the standard water measuring devices designed to operate under open and closed flow conditions.

OPEN FLOW

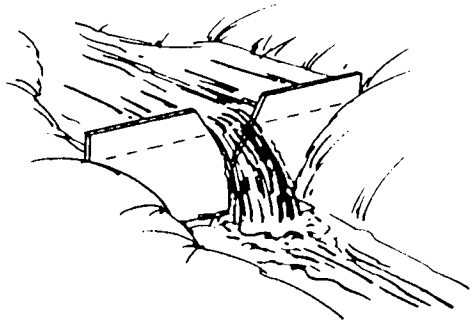
Idaho has many miles of open canals and ditches. On-farm conveyance and distribution systems equipped with measuring devices will improve water distribution and make the irrigation job much easier.



Rectangular weir



Cipolletti weir



V-notch weir

Fig. I. Three types of weirs used in Idaho.

Weirs

A weir is an over-pour notch of fixed dimensions in a vertical bulkhead or head wall through which water may flow. When properly constructed, installed and maintained, it provides a simple and accurate means of measuring water. Weirs are easy to construct and accurate if dimensions are followed carefully. They will handle floating trash and not clog easily.

Every water-measuring device has a set of standard operating conditions that must be met if it is to be accurate. If these conditions cannot be met at a given site, another measuring device should be used. A weir requires approximately a 6-inch drop between the upstream and downstream water surfaces. This loss in head is often not available in ditches with flat grades. The water must approach the weir crest very slowly. This condition is achieved by backing the water up in a weir pond with a bulkhead or head wall.

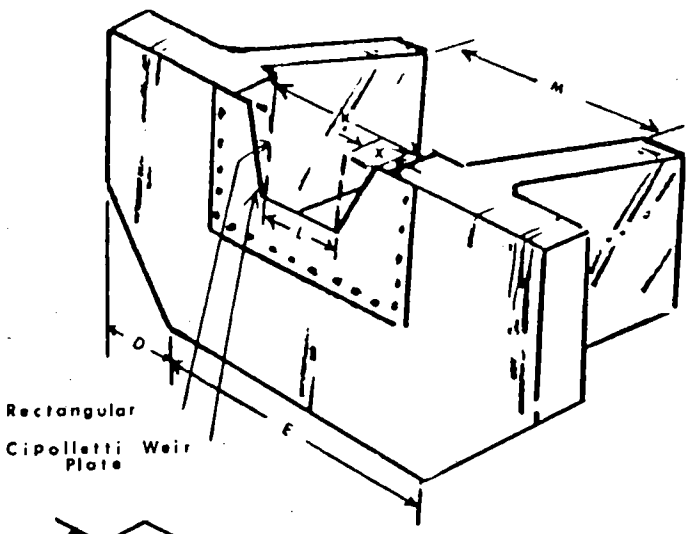
If the water is carrying silt it may settle out and fill the weir pond. This causes the approach velocity of the water to increase and the device becomes inaccurate. Grass and weeds thrive in the slow water and the weir pond requires maintenance to keep it free of silt and weeds.

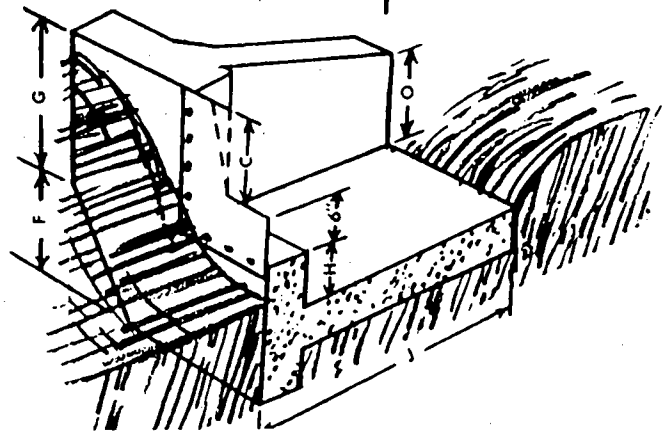
Commonly used weirs, classified by the shape of the notch, are the rectangular weir, the Cipolletti weir, and the V-notch weir as illustrated in Fig. 1.

How to Install a Weir

A weir can perform accurately only if correctly constructed, installed and used. The following standard conditions must be followed:

1. Set the weir in a channel that is straight for a distance upstream from the weir of at least 10 times the weir crest length.
2. Place the weir at right angles to the direction of flow, and vertical.
3. The water approaching the weir should be free from eddies and flow slower than one-half foot per second. A weir pond can be created by the way the structure is built. The height of the crest above the bottom of the ditch should be at least twice the maximum head or depth of water flowing over the crest. The distance from the side of the weir notch to the side of the channel should be at least twice the maximum weir head. This is called a contracted weir. A bulkhead of the above proportions is used with a metal weir plate fastened to it.
4. Avoid backing the water up on the downstream side of the weir. Water must flow freely below the device, leaving an air space under the over-falling sheet of water. A concrete or rock apron should be used to prevent washing below the structure.
5. The weir plate containing the notch is usually made of steel plate no thicker than 1/8 inch. It must have exact dimensions and its edges must be rigid, straight and sharp on the upstream face. The notch should be beveled at 45 degrees on the downstream side. Avoid knife edges as they are difficult to maintain. The weir crest should be level and very accurate in length.
6. Select the crest size so the minimum head to be measured exceeds 2 inches and the maximum head is not greater than one-third the length of the weir.





Crest length L ft	Recommended range of measurement in C.f.s. Rectangular	Cipolletti	C=H ft-in	D ft-in	E ft-in	F ft-in	G ft-in	J ft-in	K ft-in	M ft-in	N ft-in	O ft-in	X in
For Rectangular and Cipolletti Weirs													
1.0	.2 to .6	.2 to .6	8	0	5-8	0	2-7	3	2	2-6	10	1-4	2
1.5	.3 to 1.7	.3 to 1.8	1	1-4	4-6	1-4	2	3-6	2-6	3	10	1-4	3
2.0	.4 to 3.5	.4 to 3.7	1-2	2	5	2	2	4	3	3-6	1	1-6	3½
3.0*	.6 to 9.5	.6 to 10.0	1-6	2-6	7	2-6	2-6	4-6	4-4	5	1-6	2	4½
4.0*	.8 to 19.5	.9 to 20.7	2	3-10	8-4	3-10	2-10	5	5-6	6	2	2-6	6
For 90° V-Notch Weirs													
2.0	.02 to 1.5		1	1-6	5	1-6	2-8	3-6	2-6	3	10	1-4	
3.0*	.02 to 4.0		1-6	2-2	6-2	2-2	3-4	4	3-6	4	1	1-6	

*Use 6" x 6" No. 12 wire mesh reinforcing or equivalent.

Fig. 2. Dimensions and capacities for Rectangular, Cipolletti and 90-degree V-notch weirs.

How to Measure

The water surface as it flows over the crest is drawn down as velocity increases. For this reason any measurement at or on the crest is not as accurate as the methods described below.

Drive a 2 x 2-inch flat-topped stake in the ground in the weir pool upstream from the crest a distance of 4 times the maximum head. Place the stake to one side in still water out of the way but readily accessible for taking readings. Use a carpenter's level or an engineer's level to set the top of the stake at the same height as the crest of the weir. The depth of flow is measured from the top of the stake to the surface of the water above it. In Idaho, frost will probably heave the stake out of place so that it would have to be re-set and maintained annually to keep the top at the same level as the weir crest.

An observation well (equipped with a staff guage) next to the weir head wall and fed by a pipe from the weir pond will refine the reading.

Water depth may be measured on a bulkhead wide enough so the gauge can be attached to it in smooth water and be unaffected by the drawdown over the crest. The gauge should be at least 1 to 1½ feet away from the side of the notch. Place the zero on the staff gauge at the same height as the crest.

A **rectangular weir** is the simplest to construct. Its crest is horizontal and its sides perpendicular. Table 3 gives the discharges over various widths of rectangular weirs with complete contractions.

The **Cipolletti weir** (named after its inventor, Cesare Cipolletti, an Italian engineer) is used most in Idaho because it will measure slightly more water than a rectangular weir with the same crest length. It is more difficult to construct. The sides diverge outwardly at a 1 to 4 slope (1 inch horizontally to 4 inches vertically). The discharges for various widths of Cipolletti weirs with contractions are shown in Table 4.

The **V-notch weir** is designed to handle small flows accurately. A 90-degree angle or V-notch can be laid out very easily using a carpenter's square. Discharge tables for the V-notch with complete contractions are shown in Table 5. Construction details and dimensions for the weirs mentioned above are illustrated in Fig. 2.

Rectangular Submerged Orifice

A rectangular submerged orifice is a sharp-edged rectangular opening in a vertical bulkhead placed in a stream perpendicular to the direction of flow, having the upstream and downstream water surface above the orifice as shown in Fig. 3. The cross-sectional area of the orifice is small in relation to the stream cross-section. These conditions provide complete contraction of stream flow and the approach velocity of the water becomes negligible.

This device is used on relatively flat ditches where fall is not adequate for a weir. It is simple, easy to construct and accurate. Water should be free from floating trash as it will clog very easily.

Table 3 (Continued). Flow over rectangular contracted weirs

Head in ft. "H"	Head in inches, approx.	Crest length (L) 1.0 foot	1.5 feet	2.0 feet	3.0 feet	4.0 feet	For each additional foot of crest in excess of 4 ft. (approx.)
		Flow in cubic feet per second					
1.10	13-3/16	5.34	7.19	10.90	14.64		3.74
1.11	13-5/16	5.41	7.28	11.04	14.83		3.79
1.12	13-7/16	5.48	7.38	11.19	15.03		3.84
1.13	13-9/16	5.55	7.47	11.34	15.22		3.88
1.14	13-11/16	5.62	7.57	11.48	15.42		3.94
1.15	13-13/16	5.69	7.66	11.64	15.62		3.98
1.16	13-15/16	5.77	7.76	11.79	15.82		4.03
1.17	14-1/16	5.84	7.86	11.94	16.02		4.08
1.18	14-3/16	5.91	7.96	12.09	16.23		4.14
1.19	14-1/4	5.98	8.06	12.24	16.43		4.19
1.20	14-3/8	6.06	8.16	12.39	16.63		4.24
1.21	14-1/2	6.13	8.26	12.54	16.83		4.29
1.22	14-5/8	6.20	8.35	12.69	17.03		4.34
1.23	14-3/4	6.28	8.46	12.85	17.25		4.40
1.24	14-7/8	6.35	8.56	12.99	17.45		4.46
1.25	15	6.43	8.66	13.14	17.65		4.51
1.26	15-1/8			13.30	17.87		4.57
1.27	15-1/4			13.45	18.07		4.62
1.28	15-3/8			13.61	18.28		4.67
1.29	15-1/2			13.77	18.50		4.73
1.30	15-5/8			13.93	18.71		4.78
1.31	15-3/4			14.09	18.92		4.82
1.32	15-13/16			14.24	19.12		4.88
1.33	15-15/16			14.40	19.34		4.94
1.34	16-1/16			14.56	19.55		4.99
1.35	16-3/16			14.72	19.77		5.05
1.36	16-5/16			14.88	19.98		5.10
1.37	16-7/16			15.04	20.20		5.16
1.38	16-9/16			15.20	20.42		5.22
1.39	16-11/16			15.36	20.64		5.28
1.40	16-13/16			15.53	20.86		5.33
1.41	16-15/16			15.69	21.08		5.39
1.42	17-1/16			15.85	21.29		5.44
1.43	17-3/16			16.02	21.52		5.50
1.44	17-1/4			16.19	21.74		5.55
1.45	17-3/8			16.34	21.96		5.62
1.46	17-1/2			16.51	22.18		5.67
1.47	17-5/8			16.68	22.41		5.73
1.48	17-3/4			16.85	22.64		5.79
1.49	17-7/8			17.01	22.85		5.84
1.50	18			17.17	23.08		5.91

Table 4 Flow over Cipolletti weirs in cubic feet per second.*

Head in ft. "H"	Head in inches, approx.	Crest length (L) 1.0 foot	1.5 feet	2.0 feet	3.0 feet	4.0 feet	For each additional foot of crest in excess of 4 ft. (approx.)
		Flow in cubic feet per second					
0.10	1-3/16	0.107	0.160	0.214	0.321	0.429	0.108
0.11	1-5/16	0.123	0.185	0.246	0.370	0.494	0.124
0.12	1-7/16	0.140	0.210	0.280	0.421	0.562	0.141
0.13	1-9/16	0.158	0.237	0.316	0.474	0.632	0.159
0.14	1-11/16	0.177	0.264	0.352	0.528	0.706	0.177
0.15	1-13/16	0.195	0.293	0.390	0.586	0.782	0.196
0.16	1-15/16	0.216	0.322	0.430	0.644	0.860	0.216
0.17	2-1/16	0.237	0.353	0.470	0.705	0.941	0.236
0.18	2-3/16	0.258	0.384	0.512	0.768	1.024	0.257
0.19	2-1/4	0.280	0.417	0.555	0.832	1.110	0.278
0.20	2-3/8	0.302	0.450	0.599	0.898	1.20	0.302
0.21	2-1/2	0.324	0.484	0.644	0.966	1.29	0.324
0.22	2-5/8	0.349	0.519	0.691	1.04	1.38	0.35
0.23	2-3/4	0.374	0.555	0.739	1.11	1.47	0.37
0.24	2-7/8	0.397	0.591	0.786	1.18	1.57	0.39
0.25	3	0.423	0.628	0.836	1.25	1.67	0.42
0.26	3-1/8	0.449	0.667	0.886	1.33	1.77	0.44
0.27	3-1/4	0.475	0.705	0.937	1.40	1.87	0.47
0.28	3-3/8	0.502	0.745	0.990	1.48	1.97	0.49
0.29	3-1/2	0.529	0.785	1.04	1.56	2.08	0.52
0.30	3-5/8	0.557	0.827	1.10	1.64	2.19	0.55
0.31	3-3/4	0.586	0.869	1.15	1.73	2.30	0.57
0.32	3-13/16	0.615	0.911	1.21	1.81	2.41	0.60
0.33	3-15/16	0.644	0.954	1.27	1.89	2.52	0.62
0.34	4-1/16	0.675	1.00	1.32	1.98	2.64	0.66
0.35	4-3/16	0.705	1.04	1.38	2.07	2.75	0.69
0.36	4-5/16	0.735	1.09	1.44	2.16	2.87	0.71
0.37	4-7/16	0.767	1.13	1.50	2.25	2.99	0.74
0.38	4-9/16	0.799	1.18	1.57	2.34	3.11	0.78
0.39	4-11/16	0.832	1.23	1.63	2.43	3.24	0.81
0.40	4-13/16	0.866	1.28	1.69	2.53	3.36	0.84
0.41	4-15/16	0.899	1.32	1.76	2.62	3.49	0.87
0.42	5-1/16	0.932	1.37	1.82	2.72	3.61	0.89
0.43	5-3/16	0.967	1.42	1.89	2.81	3.74	0.93
0.44	5-1/4	1.00	1.47	1.95	2.91	3.87	0.97
0.45	5-3/8	1.04	1.53	2.02	3.01	4.01	1.00
0.46	5-1/2	1.07	1.58	2.09	3.11	4.14	1.02
0.47	5-5/8	1.11	1.63	2.16	3.21	4.28	1.06
0.48	5-3/4	1.15	1.68	2.23	3.32	4.41	1.10
0.49	5-7/8	1.18	1.74	2.30	3.42	4.55	1.13
0.50	6	1.22	1.79	2.37	3.53	4.69	1.16
0.51	6-1/8	1.26	1.85	2.44	3.64	4.83	1.20
0.52	6-1/4	1.30	1.90	2.51	3.74	4.97	1.24
0.53	6-3/8	1.34	1.96	2.59	3.85	5.12	1.26
0.54	6-1/2	1.38	2.02	2.66	3.96	5.26	1.30
0.55	6-5/8	1.42	2.07	2.74	4.07	5.41	1.33
0.56	6-3/4	1.46	2.13	2.81	4.18	5.56	1.38
0.57	6-13/16	1.50	2.19	2.89	4.30	5.71	1.41
0.58	6-15/16	1.54	2.25	2.97	4.41	5.86	1.44
0.59	7-1/16	1.58	2.31	3.05	4.53	6.01	1.49

*Computed from Cone's formula: $Q = 3.247 \left(L - \frac{0.2H}{1 + 2H}\right) H^{1.5} + 0.609 H^{2.5}$

Table 4 (Continued). Flow over Cipolletti weirs.

Head in ft. "H"	Head in inches, approx.	Crest length (L) 1.0 foot	1.5 feet	2.0 feet	3.0 feet	4.0 feet	For each additional foot of crest in excess of 4 ft. (approx.)
		Flow in cubic feet per second					
0.60	7-3/16	1.62	2.37	3.13	4.64	6.17	1.53
0.61	7-5/16	1.67	2.43	3.20	4.76	6.32	1.55
0.62	7-7/16	1.71	2.49	3.28	4.88	6.47	1.60
0.63	7-9/16	1.75	2.55	3.37	5.00	6.63	1.63
0.64	7-11/16	1.80	2.62	3.45	5.12	6.79	1.67
0.65	7-13/16	1.84	2.68	3.53	5.24	6.95	1.72
0.66	7-15/16	1.89	2.75	3.61	5.36	7.11	1.75
0.67	8-1/16	1.93	2.81	3.70	5.48	7.28	1.79
0.68	8-3/16	1.98	2.87	3.79	5.61	7.44	1.83
0.69	8-1/4	2.02	2.94	3.87	5.73	7.61	1.87
0.70	8-3/8	2.07	3.01	3.95	5.86	7.77	1.91
0.71	8-1/2	2.12	3.07	4.04	5.99	7.94	1.95
0.72	8-5/8	2.16	3.14	4.13	6.12	8.11	1.99
0.73	8-3/4	2.21	3.21	4.22	6.24	8.28	2.03
0.74	8-7/8	2.26	3.28	4.31	6.38	8.45	2.08
0.75	9	2.31	3.35	4.40	6.51	8.62	2.12
0.76	9-1/8	2.36	3.42	4.49	6.64	8.80	2.16
0.77	9-1/4	2.41	3.49	4.58	6.77	8.97	2.21
0.78	9-3/8	2.46	3.56	4.67	6.90	9.15	2.24
0.79	9-1/2	2.51	3.63	4.76	7.04	9.33	2.29
0.80	9-5/8	2.56	3.70	4.85	7.18	9.51	2.33
0.81	9-3/4	2.61	3.77	4.95	7.31	9.69	2.38
0.82	9-13/16	2.66	3.84	5.04	7.45	9.87	2.42
0.83	9-15/16	2.71	3.92	5.14	7.59	10.05	2.46
0.84	10-1/16	2.77	3.99	5.23	7.73	10.23	2.51
0.85	10-3/16	2.82	4.07	5.33	7.87	10.42	2.55
0.86	10-5/16	2.87	4.14	5.43	8.01	10.60	2.60
0.87	10-7/16	2.93	4.22	5.52	8.15	10.79	2.64
0.88	10-9/16	2.98	4.29	5.62	8.30	10.98	2.69
0.89	10-11/16	3.04	4.37	5.72	8.44	11.17	2.72
0.90	10-13/16	3.09	4.45	5.82	8.59	11.36	2.77
0.91	10-15/16	3.15	4.53	5.92	8.73	11.55	2.82
0.92	11-1/16	3.20	4.60	6.02	8.88	11.74	2.87
0.93	11-3/16	3.26	4.68	6.13	9.03	11.94	2.91
0.94	11-1/4	3.32	4.76	6.23	9.17	12.13	2.96
0.95	11-3/8	3.37	4.84	6.33	9.32	12.33	3.00
0.96	11-1/2	3.43	4.92	6.44	9.48	12.53	3.05
0.97	11-5/8	3.49	5.00	6.55	9.62	12.72	3.10
0.98	11-3/4	3.55	5.09	6.64	9.78	12.92	3.14
0.99	11-7/8	3.61	5.17	6.75	9.93	13.12	3.19
1.00	12	3.67	5.25	6.86	10.08	13.32	3.24
1.01	12-1/8		5.33	6.96	10.24	13.53	3.29
1.02	12-1/4		5.42	7.07	10.40	13.73	3.34
1.03	12-3/8		5.50	7.18	10.55	13.94	3.38
1.04	12-1/2		5.59	7.29	10.71	14.15	3.43
1.05	12-5/8		5.67	7.40	10.87	14.35	3.48
1.06	12-3/4		5.76	7.51	11.03	14.56	3.53
1.07	12-13/16		5.84	7.62	11.18	14.76	3.58
1.08	12-15/16		5.93	7.73	11.35	14.98	3.63
1.09	13-1/16		6.02	7.84	11.51	15.19	3.68

Table 4 (Concluded). Flow over Cipolletti weirs.

Head in ft. "H"	Head in inches, approx.	Crest length (L) 1.0 foot	1.5 feet	2.0 feet	3.0 feet	4.0 feet	For each additional foot of crest in excess of 4 ft. (approx.)
		Flow in cubic feet per second					
1.10	13-3/16	6.11	7.96	11.68	15.41	3.74
1.11	13-5/16	6.20	8.07	11.84	15.62	3.79
1.12	13-7/16	6.29	8.18	12.00	15.84	3.84
1.13	13-9/16	6.37	8.29	12.16	16.04	3.88
1.14	13-11/16	6.46	8.41	12.33	16.26	3.94
1.15	13-13/16	6.56	8.53	12.50	16.48	3.98
1.16	13-15/16	6.65	8.65	12.67	16.70	4.03
1.17	14-1/16	6.74	8.76	12.84	16.93	4.08
1.18	14-3/16	6.83	8.88	13.01	17.15	4.14
1.19	14-1/4	6.93	9.00	13.18	17.37	4.19
1.20	14-3/8	7.02	9.12	13.35	17.59	4.24
1.21	14-1/2	7.11	9.24	13.52	17.81	4.29
1.22	14-5/8	7.20	9.36	13.69	18.03	4.34
1.23	14-3/4	7.30	9.48	13.87	18.27	4.40
1.24	14-7/8	7.40	9.60	14.04	18.49	4.46
1.25	15	7.49	9.72	14.21	18.71	4.51
1.26	15-1/8			14.39	18.95	4.57
1.27	15-1/4			14.56	19.17	4.62
1.28	15-3/8			14.74	19.41	4.67
1.29	15-1/2			14.92	19.65	4.73
1.30	15-5/8			15.11	19.88	4.78
1.31	15-3/4			15.29	20.12	4.82
1.32	15-13/16			15.46	20.34	4.88
1.33	15-15/16			15.64	20.58	4.94
1.34	16-1/16			15.82	20.82	4.99
1.35	16-3/16			16.01	21.06	5.05
1.36	16-5/16			16.19	21.29	5.10
1.37	16-7/16			16.37	21.53	5.16
1.38	16-9/16			16.57	21.78	5.22
1.39	16-11/16			16.75	22.02	5.28
1.40	16-13/16			16.94	22.27	5.33
1.41	16-15/16			17.13	22.51	5.39
1.42	17-1/16			17.31	22.75	5.44
1.43	17-3/16			17.51	23.01	5.50
1.44	17-1/4			17.70	23.26	5.55
1.45	17-3/8			17.89	23.50	5.62
1.46	17-1/2			18.08	23.75	5.67
1.47	17-5/8			18.28	24.01	5.73
1.48	17-3/4			18.47	24.26	5.79
1.49	17-7/8			18.66	24.50	5.84
1.50	18			18.85	24.75	5.91

7/27/94 by AD

This day I had a conf. call with Nick Spencer & Larry Kempton regarding issues on delivery on Clear CK.

- we discussed how water was measured.
  1) To get 20 cfs figure before turning to Idaho they use meas. from headgates in Utah. U.S.G.S. gage specified in decree not used.
  2) To get 17 cfs or below they use measurement in or at Idaho weir. Again USGS gage specified in decree not used.
- we discussed possibility of transfer of un-used (Arimo water) in Idaho being transfered to Utah users or Mr. Kempton specifically. Nick is to send Kempton copy of Statutes 42-400 → pertaining to issues of ente-state (use).

Larry Kempton offered and it seems a good idea that we meet with Vern (his son) who is the watermaster for Clear CK water users.

I spoke with Frank to set up Arimo & Holmgren Rights then we might schedule meeting with Vern.

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Mr. Kempton explained that NAF Irrig. Co. is all Utah water and that Jones has a portion of it. This NAF Irrig. water is not supposed to be used below the Nzf Road.

He indicated that this yr. is very unusual in that water has or will only turned to Idaho for 8 days. He indicated that in 1992 it was turned for 5 days there have been the most years. Normally he indicated that Idaho usually gets the 560 AF. plus the share of the 750 AF. He indicated that the Gunnel rights (now owned by Simpson) have not been used for many yrs. He said that the Arimo water has been leased to Ray Jones since they can't use it due to delivery problems & since they have sprinklers.

I believe there are issues of forfeiture for Arimo water & (Simpson - no claims filed yet). Also I think the manner in which the 20 & 17 cfs are measured as specified in the NAF decree are not being measured and since the stream is loosing I'd users are be[illegible]