OFFICE OF SEVIER RIVER COMMISSIONER

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The procedure followed to compute the discharge at the five guaging stations was somewhat the standard stream guaging methods. A discharge curve was established then a guage height ± shift was applied by daily increments so that the curve passed through the current meter measurement on the day the measurement was taken. The daily discharge was computed by adding to or subtracting from the recorded guage height the applied shift, and then reading the discharge for the compensated value from the discharge curve. The daily discharge for all five stations were plotted on one hydrograph. The guage height shifts were then adjusted so that the hydrograph of each station would be consistent with the adjacent stations. This procedure has an effect of some averaging of the measurements.

Station #5 being the inlet, and key station, was current metered more often. A policy was followed that any measurement that indicated a change was followed as soon as possible by a backup measurement to confirm the first measurement. It was found that #5 did have large changes. For example, a current meter measurement was taken 6-25-70 to confirm a large-shift of a measurement taken 6-11-70. The strip chart record of #5 shows a decrease of guage height of .18' from 6-26-70 to 6-27-70 but #4 four miles downstream had nearly the same water with a recorded flush of water for approximately four hours with no corresponding inflow from #5. This rather dramatically confirmed that something downstream (at least two pasture fences that could have trapped weeds) had caused a large-shift

and also the magnitude of the sudden change on these two days was almost exactly confirmed by the next two current meter measurements. From May 14 to June 13 station #4 was very stable and this plot was used to help determine the time and extent of the change occuring on station #5.

A high flow and a low flow measurement was made on gage #5 in September. Curve #2 was drawn passing through these two measurements and used to compute the daily discharges for the last turn in of August 27 to September 17.

During the turn out of June 13 to June 23 the Millard County Road Department burned the bridge just downstream from station #4 in preparation to build a new bridge. The change caused by the cleaning done for the new bridge was indicated by subsequent current meter measurements and drawn as curve #2.

This method has produced a hydrograph that indicates there is an increasing seepage loss as the water temperature increased during the hot weather and decreased in late August and September.

There was a period of time, April 13-25 and July 23-August 8, when nearly all the water diverted at the canal head was going past station #5. Deducting the diversions, when there were any, isolates the seepage loss on the upper end of the system as a consistant 10-12 cfs. A recorder was used at Landis Check (#5) in a study done in 1966. This 10-12 cfs from the canal head to station #5 was the seepage loss at that time. The seepage loss between #5 and #1 in 1966 is just about the same as found in 1970 during the corresponding time of the season. A comparison with the 1966 loss study shows that the seepage losses do not diminish with increased time of water turns in the canal. The noticable variable is that as the water viscosity decreases the seepage rate increases. The

acre feet quantity lost could be reduced by decreasing the inflow but very little land could be served to maintain a crop during the growing season with any significant decrease in the diversion at the head.

The hydrograph shows one very serious problem on this canal. Delivery to farms on the upper end out of the canal; then thirty miles of canal with fluctuating flows at the end for delivery to the remaining farms, makes it very difficult if not impossible to make uniform deliveries and charges to the users. It is probable that the fluctuating flow to the farms causes a very serious decrease in the efficiency of use of the irrigation water. Because of the time lapse from regulation to delivery, there will be no easy solution to this problem.

After the 1966 study considerable canal cleaning was done. Station #4, #3 and just upstream from #1 have the original gages still installed. Checking against 1970, the flows indicate the conveyance efficiency was greatly improved in the first four miles and quite an increase of flow rate for a given gage height at station #3, but increasing the flow rate downstream greatly increased the seepage loss so that at the end of the canal little improvement is realized. Piecemeal canal lining should be very carefully considered for this canal.

It is interesting to speculate what problems could be solved and what the operation would be if this seepage loss could be retained for use by the stockholders of the irrigation company. For example if the water could be pumped out of the canal in Lemmington Canyon up to Feel Creek Flat and put into a 60 cfs concrete canal the sand dune area would mostly be by-passed. Where any dune areas would have to be traversed the increased water velocities

would eliminate the blowing sand problem. Pumping the water would solve the regulation difficulties and even make possible some conversion to sprinklers, greatly increasing the efficiency of use. The filling of Sevier Bridge Reservoir gives this company two years water of equal magnitude of 1970. If the seepage was all saved this gives the company sufficient water for a like delivery of 1970 for six years. This together with their year to year accumulation would indicate that it would be possible for them to average the wet and dry cycles to achieve a delivery to the farms each year comparable to 1970.

Whatever action taken by the Central Utah Water Company should be preceded by one basic improvement project. This project should be to upgrade their measuring system. Poor measurement at the farm turn outs has created a poor record for the company and this in turn has probably depreciated the value of the waterstock. Equity of benefits and costs can be accomplished only by a good measuring system.