May 5, 2002

Mr. Bob Shaffer
General Manager
Big Lost River Irrigation District
P.O. Box 205
Mackay, Idaho 83251

Dear Mr. Shaffer:

At the Watermaster training workshop on April 17, 2003, you requested additional information on historic data and the method used to estimate reservoir evaporation in the Department's Big Lost River water right accounting program. Pan evaporation data was collected at Mackay Reservoir between 1966 and 1985. This data is on file with the University of Idaho State Climate Services and is attached for reference. The attached table shows the historic pan evaporation data, reported as total evaporation for the month in inches. Pan evaporation is typically multiplied by 0.70 or 0.72 to estimate the reservoir evaporation in inches.

Because evaporation pan measurements at Mackay Reservoir were discontinued in 1985, the Department's water right accounting program estimates the reservoir evaporation using daily evapotranspiration (ET) data from the Aberdeen AgriMet Station, located near American Falls reservoir. The correlation between the Aberdeen ET data and Mackay Reservoir evaporation is based on comparisons of historic data. A two-year study conducted at Aberdeen and American Falls Reservoir was used to determine the correlation between ET data and reservoir evaporation. Historic pan evaporation data collected at Mackay Reservoir between 1974 and 1983 was correlated with pan evaporation data collected at the Aberdeen Experiment Station during the same years to account for the difference in climate between Aberdeen and Mackay Reservoir. The resulting correlation factor between the Aberdeen reference ET and Mackay Reservoir evaporation was determined to be 0.78. The attached memorandum describes the development of this correlation in more detail.

The Department's water right accounting program multiplies the daily Aberdeen reference ET by 0.78 to estimate the daily reservoir evaporation in inches. The evaporation in inches is then multiplied by the reservoir's surface area to calculate the volume of water lost to evaporation. The reservoir's surface area is calculated from the daily reservoir content reported by your irrigation district. The Department's water right accounting program output reports the total reservoir evaporation from the beginning of

the irrigation season in acre-feet, and the daily reservoir evaporation converted to an average daily flow rate in cubic feet per second.

If you have further questions regarding the evaporation data, please contact me at 208-327-7871.

Sincerely,

Jennifer Berkey
Water Distribution Section

cc: Robert Duke, Watermaster, Water District 34

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Mackay Reservoir Evaporation Data

Cumulative monthly pan evaporation data measured at Mackay Reservoir between 1966 and 1985

	Pan Evaporation (inches)																				Average Monthly Pan Evap. (inches)	Average Monthly Reservoir Evap. (inches) pan evap. * 0.72
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985		
JANUARY																						
FEBRUARY																						
MARCH																						
APRIL																						
MAY			6.06		7.12			8.96				4.96									6.78	4.88
JUNE			8.64	7.72	7.41		7.36	9.74	11.40		10.29	7.97	8.79	10.18	7.94	9.49			6.11		8.70	6.26
JULY	13.50	9.17	11.69	10.98	9.70	10.69	11.86	10.18	11.26	9.02	11.19	9.46	9.13	11.19	9.69	10.77		8.56	8.53	10.81	10.39	7.48
AUGUST	11.19		7.43	11.29	10.19	9.16	9.45	9.93	9.61	9.14	7.26	7.74	9.30	7.47	9.40	9.28	8.68	7.32	7.12	9.23	8.96	6.45
SEPTEMBER	7.30	6.80	6.35	7.13	5.46	6.72		5.76	8.60												6.77	4.87
OCTOBER																						
NOVEMBER																						
DECEMBER																						

Notes:
Data listed above is pan evaporation. Pan evaporation is typically multiplied by 0.7 or 0.72 to estimate reservoir evaporation.
Data obtained from the University of Idaho State Climate Center on May 6, 2003.