

MEMORANDUM

Date: December 26, 2003

To: Transfer 70947

From: Jeff Peppersack

Re: Evaporation Calculations

This memo summarizes results of my review of evaporation calculations prepared by Roger Wright P.E., on behalf of the applicant for this transfer.

The calculations appear to focus on the rate of diversion necessary to overcome evaporation from the pond(s). Since a transfer cannot result in an enlargement of a water right, the consumptive and total diversion volume must also be considered in water use calculations before and after the transfer. The total pond water use, both instantaneous and annual use, must be compared to total water use from irrigation to ensure that enlargement will not occur.

The annual volume of water consumed is generally the limiting factor for ponds. Consumptive use for irrigation diversions can be calculated based on the total crop evapotranspiration minus effective precipitation during the growing season. Based on the calculations and data provided, the consumptive use for irrigation is 35.4 inches per acre per season (2.95 ft/yr).

Consumptive use for ponds can be calculated based on the annual free water surface evaporation (for year-round ponds). Precipitation can be subtracted on the basis that it would be evaporated or consumed by crops on the lands in native or vegetative state, but only to the extent of the evaporation or consumption. Based on the calculations and data provided, the consumptive use for the ponds totals 57 af for ponds covering 20.74 acres surface area (see attached spreadsheet).

The number of irrigated acres required to account for the pond evaporation is 19.3 acres (57 af divided by 2.95 ft/yr). This is roughly a one-to-one swap for irrigated lands vs. pond surface area, as generally assumed by IDWR.

Month	Pond Calculations											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Days	31	28	31	30	31	30	31	31	30	31	30	31
Precip (in/mo)	1.44	1.16	1.23	1.21	1.28	0.89	0.27	0.3	0.6	0.79	1.35	1.36
Precip (in/day)	0.05	0.04	0.04	0.04	0.04	0.03	0.01	0.01	0.02	0.03	0.05	0.04
Pan evap (in/mo)	0	0	0	5.62	7.06	8.78	10.55	9.37	6.54	4.57	0	0
Pan evap (in/day)	0.00	0.00	0.00	0.19	0.23	0.29	0.34	0.30	0.22	0.15	0.00	0.00
Cp	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Evap (Pan evap * Cp, in/mo)	0.00	0.00	0.00	4.10	5.15	6.41	7.70	6.84	4.77	3.34	0.00	0.00
Evap (in/day)	0.00	0.00	0.00	0.14	0.17	0.21	0.25	0.22	0.16	0.11	0.00	0.00
Loss (Evap - Precip, in/day)	0*	0*	0*	0.10	0.12	0.18	0.24	0.21	0.14	0.08	0*	0*
Pond Surf (acres)	20.74	20.74	20.74	20.74	20.74	20.74	20.74	20.74	20.74	20.74	20.74	20.74
Total Loss (ac-in)	0.0	0.0	0.0	60.0	80.3	114.5	154.1	135.6	86.6	52.8	0.0	0.0
Total Loss (ac-ft)	0.0	0.0	0.0	5.0	6.7	9.5	12.8	11.3	7.2	4.4	0.0	0.0
* Precip exceeds Evap												
Total												
57.0												

Irrigation Consumption

Mean Irrig. Requirement (in/seas)	35.4
Mean Irrig. Requirement (ft/seas)	2.95
Acres to dry up for pond use	19.3