

SCANLAN ENGINEERING*Groundwater and Environmental Engineering*

April 17, 2001

Ron Carlson
Eastern Region Office
Idaho Department of Water Resources
900 North Skyline, Suite A
Idaho Falls, ID 83402

Subject: Applications for Permit 34-07581, 34-07596 and 34-07597

Dear Ron:

In response to your e-mail of April 5, 2001, this letter provides my opinion regarding the potential for water losses (seepage and evaporation) from the pond proposed by Bar Horseshoe Ranch to impact storage in Mackay Reservoir.

As discussed in my letter of March 14, 2001, the pond will be constructed in the close proximity to Warm Springs Creek, approximately 4 miles above Mackay Reservoir. The water table depth at the pond site is approximately 4 feet below ground surface. The pond is anticipated to leak water into the shallow aquifer through pond bottom seepage. The rate of seepage cannot be determined at this time.

Upstream from the pond site, depth to the water table increases. Downstream from the pond site, the water table is at or above stream level. As a result, Warm Springs Creek is a losing stream above the pond site and a gaining stream below the pond site. Groundwater discharges into Warm Springs Creek and other spring creeks between the pond and Mackay Reservoir as baseflow on a perennial basis.

In my opinion, the construction of the proposed pond should have a negligible impact on storage accrual or downstream water rights for the following reasons.

1. Evapotranspiration from irrigated lands in the pond vicinity and evaporation from the surface of the proposed pond are assumed to be approximately equal. The ratio of evapotranspiration to pond evaporation may vary from month to month, but the total annual amounts are assumed to be similar. If data were available to show the actual ratio of evapotranspiration to free water surface evaporation, then the reduction in irrigated area required to mitigate for the pond evaporation could be adjusted. For the purpose of transfer 5004, the ratio was assumed to be 1:1.
2. Groundwater storage in the shallow aquifer between the pond site and the reservoir is essentially at capacity, as demonstrated by the gaining nature of the spring creeks above

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the reservoir. In other words, the aquifer matrix in the area between the pond site and the reservoir is completely filled and is "spilling" water into the spring creeks. Therefore, any seepage loss from the pond to the aquifer should reappear as downstream gains in streams tributary to the reservoir. The seepage losses to the shallow aquifer from the pond should have no impact on groundwater underflow past Mackay Dam.

3. Pumping groundwater from the shallow aquifer into the pond to replace seepage losses and maintain pond level should have no impact on the combined inflow of surface water and groundwater into Mackay Reservoir. Pumping groundwater at rates greater than seepage loss might reduce stream gains between the pond site and the reservoir (but increase nearby surface flows). Pumping groundwater at rates less than seepage loss might increase stream gains between the pond site and the reservoir (but decrease nearby surface flows). In either event, there should be no net impact to storage accrual in Mackay Reservoir and no impact to groundwater underflow past Mackay Dam.

In summary, as long as the evaporation from the pond site is not significantly greater or lesser than the evapotranspiration from the equivalent acreage of irrigated agricultural land, the pond should result in no net change to consumptive use above Mackay Reservoir. With no net change in consumptive use, no impacts to storage accrual are anticipated. The gaining nature of the spring creeks between the pond site and Mackay Reservoir will attenuate any local hydraulic impacts caused by pond seepage or shallow groundwater pumping.

The next meeting of the Big Lost River Irrigation District Board is scheduled for May 1, 2001. We hope to be able to have the Board sign a stipulation for protest withdrawal at that time. In the meantime, please contact me to discuss appropriate stipulation language that will address concerns of both the Department and the Irrigation District relative to these applications.

Sincerely,



Terry M. Scanlan, P.E., P.G.
Engineer/Hydrogeologist

Cc: Walter Stoecklein
David Stoecklein
Big Lost River Irrigation District

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