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State of Utah

DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER
Executive Director

Division of Water Rights

KENT L. JONES
State Engineer Division Director

May 10, 2018

Jeff Budge, P.E.
Operations and Engineering Manager
Provo River Water Users Association
285 West 1100 North
Pleasant Grove, UT 84062

RE: Import and Return Flow Quantification in Utah Lake

Dear Jeff:

We received your letter of April 10, 2018 regarding quantification of return flow accumulated in Utah Lake from import sources. The purpose of this letter is to address quantification of return flows that have accumulated up to this point. Prospective quantification of return flows will be addressed in a future Order of the State Engineer in the active administrative process initiated under Water Right Number 55-262.

Irrigation Return Flow

You have requested an irrigation return flow percentage of 35%. This quantity has been or is currently being used in similar quantification methodologies. For the purposes of quantifying water that has presently accumulated in Utah Lake a 35% return flow can be used. However, this number is based on historical irrigation practices and conveyance facilities and we have concerns that this may no longer be an accurate number based on current operations.

Municipal Return Flow

You have requested a municipal return flow percentage of 90%. The standard return flow percentage used by the state engineer is 80% absent a municipality-specific study showing a different amount. For presently accumulated Utah Lake return flow, credit can be given for 80% of municipal water used.

Mixed-Use Return Flows

The state engineer has evaluated the last ten years of water use in Provo and Orem Cities and believes a mixed use return of 50% can be used for presently accumulated return flow in Utah Lake. This analysis assumes 80% return flow from indoor use and 35% return flow from irrigation. As noted earlier, however, the state engineer is concerned that current operations result in a smaller amount of irrigation return flow, particularly when used in cities for lawns and gardens.



Geographic Differences in Return Flow to Utah Lake

Most of the irrigation return flow in question is considered to be directly tributary to Utah Lake. However, return flow in the most northern part of the valley including west of the Jordan River is considered to be partially tributary to Utah Lake and partially tributary to the Jordan River. Return flow to the Jordan River can be considered a return flow credit in Utah Lake if it returns to the Jordan River during the irrigation season since it reduces the demand on storage in Utah Lake. It is assumed that return flow to the Jordan River returns through the groundwater system essentially uniformly throughout the entire year, meaning that half would be available during the irrigation season. The amount of return flow that can be credited to Utah Lake also varies depending on the proximity of the conveyance works and irrigated land to Utah Lake and the Jordan River, particularly when accounting for the groundwater and surface water gradients. The following geographic coefficients are considered to be reasonable based on the factors described above.

Provo	1.0
Orem	1.0
Lindon	1.0
Pleasant Grove	1.0
American Fork	1.0
Highland	0.85
Alpine	0.85
Lehi	0.75
West of Jordan River	0.6

Evaporation From Utah Lake

For the purposes of water currently accumulated in Utah Lake the evaporation can be quantified using the modified Blaney-Criddle method and calibrated coefficients (k values) described in Research Report #145¹ for the Utah Lake Lehi Station. However, the state engineer is concerned that this method under-represents the actual amount of evaporation occurring, particularly at the edges of the lake.

Effective Date

Any return flow credits existing or potentially existing in Utah Lake up until April 9, 2012 would have spilled out. As of April 10, 2012 Utah Lake has been at or below compromise and return flows have accrued since that time subject to evaporation and exchange.

Request For Updated Quantification

Your letter identifies a total of 31,310 acre-feet of accumulated return flow in Utah Lake based on the method you have proposed. We request you submit a modified quantification of return flow accumulated in Utah Lake based on the guidelines in this letter. Please provide sufficient detail showing location the water was used, return flow calculations, evaporation calculations

¹ Utah Agricultural Experiment Station Research Report #145, Consumptive Use of Irrigated Crops in Utah, p. 344-345, Robert W. Hill, 1994.

based on the incremental increase in area, the water already exchanged, and any other information that will help us to evaluate your quantification. I should reiterate that this quantification method applies to return flows that have currently accumulated in Utah Lake since April 10, 2012. Quantification of future return flows will be addressed in the pending administrative action initiated under Water Right Number 55-262. If you have any questions, please contact Jared Manning, Assistant State Engineer.

Sincerely,

A handwritten signature in black ink, appearing to read "Kent Jones". The signature is fluid and cursive, with a large, sweeping flourish at the end.

Kent Jones, P.E.
Utah State Engineer

cc:

John Larsen
Utah Lake Commissioner
2399 East 10265 South
Sandy, UT 84092