

EXHIBIT 1

LOWER WALKER RIVER CONVEYANCE PROTOCOLS

Walker River Paiute Tribe (WRPT), U.S. Bureau of Indian Affairs (BIA),
and National Fish and Wildlife Foundation (NFWF)

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Version 3.6

1. Purpose

This document sets forth protocols for conveyance in the Lower Walker River through the Walker River Indian Reservation (WRIR) to Walker Lake of water acquired and/or secured, by purchase, lease, or otherwise, under authority of the Walker Basin Restoration Program in accordance with all necessary approvals (i.e., Program Water or PW). These “Protocols” are designed to provide transparency for the management and administration of Program Water in the Lower Walker River (i.e. from the USGS Gage at Wabuska down to Little Dam). The Protocols explicitly recognize the authority of the Chief Deputy Water Commissioner (i.e. Federal Watermaster or FWM) of the U.S. Board of Water Commissioners to administer water rights under the Walker River Decree, while providing a transparent set of tracking equations (and companion spreadsheet accounting tool) so that WRPT, BIA and NFWF may cooperatively and collaboratively manage Program Water conjunctively with the WRIR Irrigation Water in the Lower Walker River. The Operator of Weber Dam facilities and the Canal 1 and Canal 2 irrigation works (i.e. Operator) is the BIA.

2. Inputs and Conveyance Reaches

The Protocols require as an initial input the amount of Program Water that is administered in priority at the Wabuska Gage by the FWM. As with any other water right that is ordered and administered on the Walker River system, the FWM will administer and record the amount of Program Water that reaches the Wabuska gage (in mean daily flow) on a daily basis.

Downstream of the Wabuska Gage, the Protocols (as presented below) provide the measurements and equations necessary to account for gains and losses of Program Water through to Little Dam, just below the final point(s) of diversion at Canals 1 and 2. Program Water will be accounted for in two defined reaches of the Lower Walker River:

1. From the Wabuska Gage to the outlet of Weber Dam,
2. From the outlet of Weber Dam to Little Dam.

The Protocols are designed to be implemented on a daily time step using real-time online data from USGS gages to the extent possible and the best available sources for any other information needed in the Protocols. All Parties will agree to a method for estimated streamflow in the event that one or more gages become inoperable. Most data used in the accounting calculations reflect the average daily values recorded from midnight to midnight of the day previous to operation ($t=0$), conforming to standard USGS reporting procedures. Flow, or Q , values in the equations below are converted to total daily quantity of water passing a particular gage or location, or the total quantity of water in Weber Reservoir, expressed in a volumetric unit of acre-feet. The conversion factor between cubic feet per second and acre-feet per day shall be 1 cfs equals 1.9835 acre-feet per day (AF/day). The Protocols are simplified by calculating

Program Water at all locations on a same day basis, with an implied transit time through Weber Reservoir of one day. The results of the calculations then inform operations, including releases at Weber Dam and regulation of flow at Little Dam, monitoring and administration for the day after the data was recorded (t+1).

3. Program Water at the Wabuska Gage

Measurement. Flows are measured by the USGS at the Wabuska Gage (10301500).

Accounting. There are two inputs to the Protocols at the Wabuska Gage:

Q_{wab} = Mean daily flow at the Wabuska Gage

PW_{wab} = Mean daily flow of Program Water at the Wabuska Gage (as provided by the FWM)

4. Program Water at Weber Dam

Measurement. The stage of Weber Reservoir and the amount of water stored are reported by the USGS daily at midnight for the Weber Reservoir gage (10301700). Daily maximum air temperature will be measured by the USGS at or near Weber Dam for estimation of daily evaporation from the water surface of Weber Reservoir. Daily total precipitation at Weber Reservoir will be measured by the USGS from a gage located at or near Weber Dam. Releases from Weber Dam are measured by a USGS gage just downstream of the dam called Walker River at PT site below Weber Reservoir (10301720).

Accounting. The Protocols are designed to simplify the accounting process in the reach from the Wabuska Gage to the release point from Weber Reservoir by applying a water balance to develop a daily estimate of unmeasured losses of flow from both the river channel and the reservoir (i.e. losses equal inflows plus change in storage less all outflows). Inputs to the water balance equation include the flow at the Wabuska Gage, the change in Weber Reservoir storage, releases from Weber Reservoir, evaporation, and precipitation. Losses during conveyance of water through the Walker River channel and seepage losses in Weber Reservoir are not differentiated, but are combined into a single river transmission loss variable. Program Water is assumed to pass from the Wabuska Gage through Weber Reservoir over a 24-hour period. Evaporation from Weber Reservoir is not charged to Program Water as it passes through on this single day. Program Water that does not pass through Weber Reservoir within 1 day is assigned a proportional share of reservoir evaporation.

The water balance equation is as follows:

$$LOSS_{tot} = WEB_{t-1} - WEB + Q_{wab} - Q_{webout} + Precip_{web} \quad \text{Eqn. (1)}$$

where:

$LOSS_{tot}$ = total net loss (if positive) or gain (if negative) in the Wabuska through Weber Reservoir reach, which consists of both river transmission losses (including reservoir seepage) and evaporative losses from Weber Reservoir less any direct precipitation on the reservoir.

WEB_{t-1} = beginning of day storage in Weber Reservoir

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Q_{webout} = total daily outflow from Weber Reservoir

$Precip_{web}$ = total daily precipitation at Weber Reservoir

Precipitation on Weber Reservoir, in acre-feet, is calculated as follows with the unit for WEB_{surf} being acres:

$$Precip_{web} = WEB_{surf} * PPT_{web} / 12 \quad \text{Eqn. (2)}$$

where:

WEB_{surf} = surface area in acres of Weber Reservoir determined based on reservoir stage and published bathymetry

PPT_{web} = daily precipitation at Weber Reservoir, inches

Daily evaporation in acre-feet from Weber Reservoir will be based on the best information available as determined by USGS including the current provisional relationship with air temperature calculated as follows:

$$Evap_{web} = WEB_{surf} * ((0.0003 * Temp_{web}) - 0.0116) \quad \text{Eqn. (3)}$$

where:

$Temp_{web}$ = maximum daily temperature recorded at Weber Reservoir, °F

The river transmission loss, $LOSS_{riv}$, is then calculated by subtracting Weber Reservoir evaporation from the total reach loss. The river transmission loss is limited to the total flow at the Wabuska Gage in order to avoid negative values for Program Water.

$$LOSS_{riv} = \text{MIN}(LOSS_{tot} - Evap_{web}, Q_{wab}) \quad \text{Eqn. (4)}$$

The net river loss (or gain) derived in Equation (4) is then assigned proportionally to Program Water based on flow percentage at Wabuska in order to compute the Program Water inflow to Weber Reservoir, PW_{webin} .

$$PW_{webin} = PW_{wab} - (PW_{wab} / Q_{wab}) * LOSS_{riv} \quad \text{Eqn. (5)}$$

where:

PW_{webin} = Program Water inflow to Weber Reservoir after river transmission losses

Under the Protocols, if a daily gain in flow is calculated, represented by a negative value of $LOSS_{tot}$, then gains are likewise allocated proportionally. The proportional allocation of gains is necessary to prevent introduction of bias into the long-term flow accounting.

The total net loss to Program Water in the Wabuska through Weber Reservoir reach, PW_{loss} , is then calculated by assigning proportional shares of river transmission loss based on flow and evaporative loss based on any Program Water not passed through Weber Reservoir within one day. The evaporative loss is allocated proportionally based on volume of Program Water in Weber Reservoir relative to the total Weber volume at the beginning of the day. The Program Water outflow (PW_{webout}) is subtracted from end

of prior day Program Water in Weber ($PW_{web\ t-1}$) in the calculation because evaporative loss is not charged to Program Water as it passes through Weber Reservoir nor is it charged to any other Program Water that is released that same day.

$$PW_{loss} = PW_{wab}/Q_{wab} * LOSS_{riv} + (PW_{web\ t-1} - PW_{webout}) /WEB_{t-1} * Evap_{web} \quad \text{Eqn. (6)}$$

where:

$PW_{web\ t-1}$ = Program Water in Weber Reservoir at beginning of day

PW_{webout} = Program Water released from Weber Reservoir

PW_{webout} is back calculated based on actual Program Water observed at Little Dam, PW_{ld} , and is discussed in the next section.

The end-of-day Program Water not passed through Weber Reservoir, PW_{web} , is calculated by:

$$PW_{web} = PW_{web\ t-1} + PW_{wab} - PW_{webout} - PW_{loss} \quad \text{Eqn. (7)}$$

Operations. Under pass-through operations for Program Water, which is the default operation under these Protocols, the Operator will release the calculated Program Water inflow (PW_{webin}) on the following day, or on successive days at its discretion, except that NFWF shall always have the right to call for the release of Program Water. If the Operator is also releasing irrigation water then any Program Water release would be added to the irrigation water release.

5. Weber Dam to Little Dam

Measurement. At Little Dam there are three possible outlets, Canal 1 and Canal 2 that serve the WRIR irrigation project and the downstream outlet to the Walker River. The downstream outlet allows water not diverted at Canals 1 or 2 to flow into the Lower Walker River and on to Walker Lake. The USGS has gages on each of these three routes of river flow at Little Dam: Canal No 1 (10301755), Canal No 2 (10301742), and Walker River above Little Dam (10301745).

Accounting. In order to calculate the Program Water released from Weber Reservoir (PW_{webout}), as well as to estimate the next day target release of water from Weber Reservoir ($TPW_{webout\ t+1}$) the loss/gain factor between the gage below Weber Dam and Little Dam is needed. Program Water natural flow loss or gain in the reach of the Walker River downstream from Weber Reservoir to Little Dam will be determined by the gaged difference in flow between the USGS gage below Weber Dam and the sum of gaged flows at Little Dam. This loss/gain factor is derived using the observed loss between the gages as follows:

$$LGF = (Q_{webout} - (Q_{canal1} + Q_{canal2} + Q_{ld})) / (Q_{webout} + 0.001) \quad \text{Eqn. (8)}$$

where:

Q_{canal1} = Mean daily flow at WRIR Canal 1

Q_{canal2} = Mean daily flow at WRIR Canal 2

Q_{ld} = Mean daily flow at the Little Dam Gage

A positive LGF signifies losses in the reach and a negative LGF signifies gains in the reach. The small value 0.001 is added in the denominator in the LGF equation to allow the calculations in the Protocols to proceed in the event that Q_{webout} is equal to zero.

The loss/gain derived in this fashion is assigned proportionally to Program Water at Little Dam in order to back-calculate the Program Water released from Weber Reservoir for that day and to estimate Program Water targeted for release over Little Dam the next day (t+1). Program Water remaining in Weber Reservoir cannot be negative.

So, Program Water released from Weber Reservoir is determined as follows:

$$PW_{\text{webout}} = PW_{\text{ld}} / (1 - \text{LGF}) \quad \text{Eqn. (9)}$$

where:

$$PW_{\text{ld}} = \text{Lesser of: } Q_{\text{ld}} \text{ or the Program Water available for release, which is } (PW_{\text{web } t-1}) * (1 - \text{LGF})$$

Mean daily flow of Program Water at the Little Dam gage would not normally exceed the Program Water available for release. Losses and gains are to be shared proportionally to avoid long-term bias in gage error, and also to proportionally recover upstream seepage losses, to the degree they may reemerge below Weber Reservoir.

The calculated next day target release of Program Water over Little Dam is determined by:

$$TPW_{\text{ld } t+1} = TPW_{\text{webout } t+1} * (1 - \text{LGF}) \quad \text{Eqn. (10)}$$

where:

$$TPW_{\text{webout } t+1} = \text{Program Water targeted for release from Weber Reservoir the next day}$$

Operations. The Operator will seek to control diversions down the Canals so as to allow the targeted amount of Program Water ($TPW_{\text{ld } t+1}$) to flow past Little Dam.

Monitoring. NFWF can directly monitor the flow of Program Water over Little Dam and the amount of Program Water as accounted for in Weber Reservoir.

Administration. There are no further water right deliveries or diversions below Little Dam. Little Dam is therefore the last point in the Walker River system for NFWF to call on the FWM for water rights administration. Good faith operations by the Operator, consistent with the intent and content of these Protocols, should obviate the need for active administration at Little Dam.

6. Little Dam to Walker Lake

Measurement. Flows downstream of Little Dam are measured by USGS gages including one located near the mouth of Walker Lake (10302025).

Accounting. Program Water reaching Walker Lake may be calculated by subtracting any observed losses between the Little Dam and Walker River near mouth gages.

Operations, Monitoring and Administration. There is no need for operations by BIA, compliance monitoring by NFWF, or water rights administration by the FWM below Little Dam due to the lack of

other water right deliveries or diversions by the WRPT. However, NFWF may monitor flows downstream of Little Dam and account for losses to Program Water and any other water flowing past Little Dam, in order to estimate Program Water contributions to Walker Lake inflow for program evaluation purposes.