Darrell E. or Nancy McDonald
P.O. Box 102
Arco, Idaho 83213-0102
Phone: 208-527-3413
Fax: 208-527-3414

MEMO:

Gary Spackman:

The attached document, from IDWR, is what Bob Shaffer is contending mandates how Storage Water is to be shrunk by reaches,.

Accounting of impounded water:

BLRID account

Prior day's account balance	31,940.1 AF
Diverted to storage	+ 9.7 AF
Account balance w/o evaporation or seepage loss	31,949.8 AF
Reservoir losses (0.2746%)	- 87.7 AF
	31,862.1 AF

Watermaster's account

Prior day's account balance	0.0 AF
Diverted to storage	+ 138.2 AF
Account balance w/o evaporation or seepage loss	138.2 AF
Reservoir losses (0.2746%)	- 0.4 AF
	137.8 AF

Reservoir losses are 88.1/(31,949.8 + 138.2) x 100 = 0.2746% of total

Determination of natural flow downstream of Mackay Dam:

Seepage losses from Mackay Reservoir are considered to be a gain to the natural flow in the reach downstream of the dam. This is a source of natural flow that is not available to water rights diverted into storage at the reservoir, thus the last right filled date for the reaches between Mackay Dam and the Darlington Sinks may be later than the last right filled date deliverable for diversion to storage in the reservoir.

Natural Flow at 2B Gage = 2B Gage + Sharp Diversion

Natural Flow at Leslie Gage = Leslie Gage + all diversions between dam and Leslie gage

Assessing Conveyance Losses to Storage Deliveries

According to IDAPA 37.03.12.040.03.b, the conveyance loss assessed to storage deliveries in each reach of the river should be determined by the watermaster on a daily basis, using daily streamflow gage readings and diversion data.

> "...Conveyance losses in the natural channel shall be proportioned by the watermaster between natural flow and impounded water. The proportioning shall be done on a river reach basis. Impounded water flowing through a reach that does not have a conveyance loss will not be assessed a loss for that reach. Impounded water flowing through any river reach that does have a conveyance loss will be assessed the proportionate share of the loss for each losing reach through which the impounded water flows. To avoid an iterative accounting procedure, impounded water conveyance loss from the previous day shall be assessed on the current day. ..."

IDAPA 37.03.12.040.03.b.i adds that

> "... An exception is made for impounded water delivered through the Beck and Evan diversion... Conveyance losses for this impounded water will be assessed the conveyance loss of the Leslie reach, if any, and the additional conveyance loss to the Beck and Evan diversion but not the conveyance loss of the entire Moore reach. ..."

The following is an example of daily accounting procedures for the assessment of conveyance losses in accordance with this rule. The river reaches are defined in IDAPA 37.03.12 025.01.

Daily data:			
	Change in Mackay Reservoir contents	353 cfs	
	Reservoir evaporation rate		10 cfs
	Sharp diversion rate		8 cfs
	2B gage reading		580 cfs
	Diversions from 2B to Leslie		96 cfs
	Leslie gage reading		472 cfs
	Beck diversion	16 cfs	
	Other diversions from Leslie to Moore	223 cfs	
	Big Lost River below Moore diversion	0 cfs	
	Exchange well injections in Eastside Canal		28 cfs
	Eastside return flow		73 cfs
	Diversions from below Moore to Munsey		61 cfs
	Big Lost River below Munsey diversion	0 cfs	
	Diversions below Munsey		0 cfs
	Arco gage reading		0 cfs

Reach gain/loss calculations:

Reach gain for Mackay Reservoir to 2B gage

2B + SHARP + CHANGE IN CONTENTS + EVAPORATION

580 cfs + 8 cfs + 353 cfs + 10 cfs = 951 cfs (gain)

Reach gain between 2B gage and Leslie gage

OUTFLOW - INFLOW + DIVERSIONS

472 cfs – 580 cfs + 96 cfs = -12 cfs (loss)

Reach gain between Leslie gage and BLR below Moore diversion

OUTFLOW – INFLOW + DIVERSIONS – EXCHANGE + ES RETURN

0 cfs – 472 cfs + 238 cfs – 28 cfs + 73 cfs = -189 cfs (loss)

Reach gain between Moore and Munsey diversions

BLW MUNSEY -- BLW MOORE – ES RETURN + DIVERSIONS

0 cfs – 0 cfs – 73 cfs + 61 cfs = -12 cfs (loss)

Calculation of percent loss by reach

Mackay Reservoir to 2B gage

No conveyance loss in this reach on this day

2B gage to Leslie gage

LOSS/TOTAL INFLOW = 12/580 x 100 = 2.07%

Leslie gage to below Moore diversion

LOSS/TOTAL INFLOW = 189/472 x 100 = 40.0%

Below Moore diversion to below Munsey

LOSS/TOTAL INFLOW = 12/73 x 100 = 16.4%

Assessment of conveyance loss to storage water deliveries

Storage water delivered above 2B gage

No conveyance loss on this day

Storage water delivered between 2B gage and Leslie gage

Conveyance loss = 2.07%

Storage water delivered to Beck diversion

Conveyance loss = 2.07% (without an additional stream gaging station potential losses between the Leslie gage and the Beck diversion cannot be determined)

Storage water delivered to other diversions in the Moore reach

Conveyance loss = (1-(1-0.0207)x(1-0.400)) x 100 = 41.2%

Storage water delivered below Moore diversion
Conveyance loss = (1-(1-0.412)x(1-0.164)) x 100 = 50.8%

If you have any questions regarding this letter please contact me at 208-327-7871 or Tim Luke at 208-327-7864.

Respectfully,

Jennifer Berkey
Water Distribution Section

cc: Bob Shaffer, Big Lost River Irrigation District

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