

# WD 34 Reservoir Water Rights

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Water District 34 Advisory Committee

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# Discussion Items

- Demand Database
- Water Rights Accounting Progress
- Reservoir Water Right Review

## Demand Database

- ❑ Unique to WD34.
- ❑ Designed to be used by the watermaster to store daily records:
  - Users rotating natural flow to reservoir.
  - 48 hour notice of natural flow water rights each user wants delivered (Demand) each day of the irrigation season.
  - Data used to predict priority date on the river
    - Natural flow available above and below reservoir
    - Only those water rights users want delivered.
- ❑ Maintains water right & rotation data needed to run the Big Lost Water Right Accounting.

## Demand Database

- ❑ 11/4/15 – Decided to have the water master collect and enter data into demand database.
- ❑ 12/8/15 – For efficiency, decided to have water master enter data into the demand database based on the records supplied by BLRID.

## Water Rights Accounting Progress

- Currently testing code.
- The water right accounting will be initiated on May 1, 2016.

# Reservoir Water Rights

- Overview of Reservoir Water Rights
- Reservoir rights in the accounting program.
- Evaporation



1	WATER ACCOUNTING REPORT FOR THE 2017 WATER YEAR: RESERVOIR FLOW INFORMATION													DATE: 07/2017	
2	REACH FLOWS IN CFS			ACTUAL	NATURAL	ACTUAL RMAINING		EXCHANGE	STORED	RESRVOIR	NATURAL	TOTAL	REACH		
3				DATE	FLOW	FLOW	NAT FLOW	FLOW	FLOW	EVAP	FLOW DIV	RCH DIV	GAIN	LAST RIGHT	
4															
5	1	BIG LOST BLW MACKAY RES			JUN 17	445.7	498.0	431.3	0.0	66.7	16.5	14.4	12.2	445.7	18870601
6	2	BIG LOST AT LESLIE			JUN 17	332.0	256.0	222.5	9.8	33.5	0.0	95.1	129.0	-113.7	18870601
7	3	BIG LOST BLW MOORE DIV			JUN 18	278.1	47.8	42.6	0.0	5.2	0.0	126.0	126.8	-53.9	18870601
8	5	BIG LOST BLW MUNSEY DIV			JUN 19	269.1	0.0	0.0	41.6	0.0	0.0	33.6	66.0	-9.0	18870601
9	6	BIG LOST NR ARCO			JUN 19	269.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18870601
10															
11	* - INDICATES FLOW ESTIMATED, NOT MEASURED									TOTALS	269.	334.	269.		
12															
13															
14															
15	RESERVOIR	PREV CONT	CURR CONT	CHNG CONT	ACC STOR	TOTL STOR	TOTL STOR	EVP	PRIORITY	RESERVOIR		RIGHT	STORED		
16		(AF)	(AF)	(CFS)	(CFS)	(AF)	(AF)					(AF)	(AF)		
17															
18	1 MACKAY	34280.0	34120.0	-80.7	4.9	41426.8	1040.1		1	MACKAY		556.5	304.6		
19									2	MACKAY		294.0	161.8		
20									3	MACKAY		556.5	140.1		
21									4	MACKAY		1113.0	213.0		
22									5	MACKAY		140.0	17.5		
23									6	MACKAY		20646.0	20646.0		
24									7	MACKAY		17205.0	17205.0		
25									8	MACKAY		6000.0	2738.8		
26															
27										TOTAL		46511.0	41426.8		
28															
29		CHANGE IN	STORAGE	ARCO	TOTAL	UNACCT									
30		CONTENT	USED	STORED	STORED	STORED									
31															
32	YEAR-TO-DATE AF	-4420.0	8009.7	0.0	2886.8	13.9									
33															
34															
35															
36		CFS	CFS	AF			CFS	CFS	AF			CFS	CFS	AF	
37	DIVERSION	DIVN	STOR	USED	DIVERSION		DIVN	STOR	USED	DIVERSION		DIVN	STOR	USED	
38															
39	2 SHARP	12.2	2.7	68.8	10 SUTTER		0.0	0.0	0.0	18 ARCO		27.9	0.0	334.0	
40	3 STREETER	0.0	0.0	0.0	11 ANGELO		0.0	0.0	0.0	19 MUNSEY		38.1	32.4	2659.3	
41	4 SWAUGER	17.0	0.0	9.6	12 BECK		11.2	0.0	56.5	20 MILLER		0.0	0.0	0.0	
42	5 MARINAC	0.0	0.0	0.0	13 LOW_BURNETT		0.0	0.0	0.0	21 MCLAUGHLIN		0.0	0.0	12.6	
43	6 DARLINGTON	41.0	8.1	439.1	14 31N1		2.0	0.0	60.9	22 FOLKMAN_PUMP		0.0	0.0	0.0	
44	7 BURNETT	71.0	25.8	1983.6	15 B&J		6.4	0.8	4.8	23 HUGGINS_PUMP		0.0	0.0	0.0	
45	8 RAINBOW_PUMP	0.0	0.0	0.0	16 MOORE		92.0	0.0	560.3	24 QUIST_PUMP_#1		0.0	0.0	0.0	
46	9 VANOUS	0.0	0.0	0.0	17 EASTSIDE		15.2	0.0	1820.2	25 QUIST_PUMP_#2		0.0	0.0	0.0	
47															
48															
49															
50															

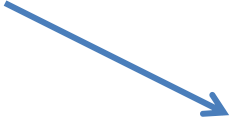
## Questions from 12/8/15 Meeting

- What are the 8 reservoir rights?
  - Could we label the rights in the accounting?
- Why are the junior rights full while the senior rights are not?
- Is rotation in the accounting?
- How is evaporation taken into account?
- With rotation, how should evaporative losses be charged to the storage users?



# Reservoir Right Table

Mackay has 8 water rights which are listed by priority date.



RESERVOIR	PREV CONT (AF)	CURR CONT (AF)	CHNG CONT (CFS)	ACC STOR (CFS)	TOTL STOR (AF)	TOTL EVP (AF)	PRIORITY	RESERVOIR	RIGHT (AF)	STORED (AF)
1 MACKAY	34280.0	34120.0	-80.7	4.9	41426.8	1040.1	1	MACKAY	556.5	304.6
							2	MACKAY	294.0	161.8
							3	MACKAY	556.5	140.1
							4	MACKAY	1113.0	213.0
							5	MACKAY	140.0	17.5
							6	MACKAY	20646.0	20646.0
							7	MACKAY	17205.0	17205.0
							8	MACKAY	6000.0	2738.8
							TOTAL		46511.0	41426.8

Right (AF)

(The volume limit of the water right.)

Stored (AF)

(The volume of water accrued to the storage right.)

Right Number	Reservoir Right # in WRA	Priority	Diversion Rate	Volume Limit	Period of Use
34-818	1	6/3/1880	3.2	556.5	5/1 - 10/15
34-811	2	6/30/1881	1.7	294	5/1 - 10/15
34-810	3	6/1/1888	3.2	556.5	5/1 - 10/15
34-10935	4	6/1/1896	6.4	1113	5/1 - 10/15
34-817 B	5	3/1/1902	0.8	140	5/1 - 10/15
34-10873	6	10/2/1905	--	20646	1/1 - 12/31
34-12	7	2/7/1916	--	17205	1/1 - 12/31
34-2507	8	9/2/1959	--	6000	1/1 - 12/31

# Natural Flow Distribution to Reservoir Water Rights

- Natural flow distribution to reservoir water rights with flow rates are limited by: (1) the amount of natural flow available at the reservoir, (2) the flow rate of the water right, (3) the annual volume limit of the water right and (4) the season of use of the water right.
- Natural flow distribution to reservoir rights without flow rates are limited by (1) the amount of natural flow that was available at the reservoir and (2) by the reservoir's water right annual volume limitation.

## Special Condition on Rights # 6 – 8 (34-10873, 34-12, and 34-2507)

A VOLUME OF WATER IN ADDITION TO THE VOLUME DESCRIBED ABOVE FOR STORAGE PURPOSES MAY BE STORED IN A SINGLE YEAR IF: A) THE ADDITIONAL VOLUME IS STORED USING THE STORAGE CAPACITY OF MACKAY RESERVIOR, AND B) ALL WATER RIGHTS EXISTING AT THE TIME OF STORAGE (INCLUDING WATER RIGHTS WITH JUNIOR PRIORITY AND OTHER RIGHTS FOR STORAGE PURPOSES) THAT ARE WITHIN THEIR PERIOD OF USE ARE SATISFIED.

RESERVOIR	PREV CONT (AF)	CURR CONT (AF)	CHNG CONT (CFS)	ACC STOR (CFS)	TOTL STOR (AF)	TOTL EVP (AF)	PRIORITY	MACKAY PRIORITIES	RIGHT (AF)	STORED (AF)
1 MACKAY	40950.0	40470.0	-242.0	4.9	46198.4	420.0	1	1880	556.5	304.6
							2	1881	294.0	161.8
							3	1888	556.5	140.1
							4	1896	1113.0	213.0
							5	1902	140.0	17.5
							6	1905	20646.0	20646.0
							7	1916	17205.0	17205.0
							8	1956	6000.0	2738.8
							9	ROTATION		0.0
								TOTAL	46511.0	41426.8
	CHANGE IN CONTENT	STORAGE USED	ARCO STORED	TOTAL STORED	ADDITIONAL VOL STORED					
YEAR-TO-DATE AF	17590.0	1726.3	4272.2	23318.4	24920.1					

# Reservoir Evaporation

- Reach Gains Calculation

*Reach gain = Outflow – Inflow + Diversions + Reservoir Change in Content + Reservoir Evaporation*

*Sum of Reach Gains = Natural Flow*

- Storage Allocation by BLRID



## Rule 40.03.a

“Evaporation losses from Mackay Reservoir shall be estimated daily by the watermaster by applying correlated evapotranspiration data from the Aberdeen hydromet station to the Mackay Reservoir and shall be assessed to all impounded water.”

# Questions?

## **Contact Information:**

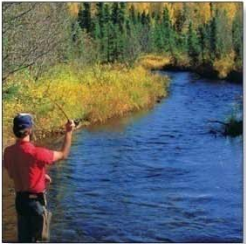
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## Estimated Demand Database Workload



➤ Manage Water rights

- Prior to irrigation season = 4 hours
- During irrigation season = 1 hour



➤ Daily calls from ditch riders = ? hours



➤ Data entry (Estimated from BLRID data)

- First day of irrigation season ~50 users = ~1.5 hours
- Multiple canals turning on/off ~35 users = ~1 hour
- Daily ~10 users = ~20 minutes

