PECOS RIVER COMPACT

Report of the River Master

Water Year 2018

Accounting Year 2019

Final Report

Neil S. Grigg
River Master of the Pecos River
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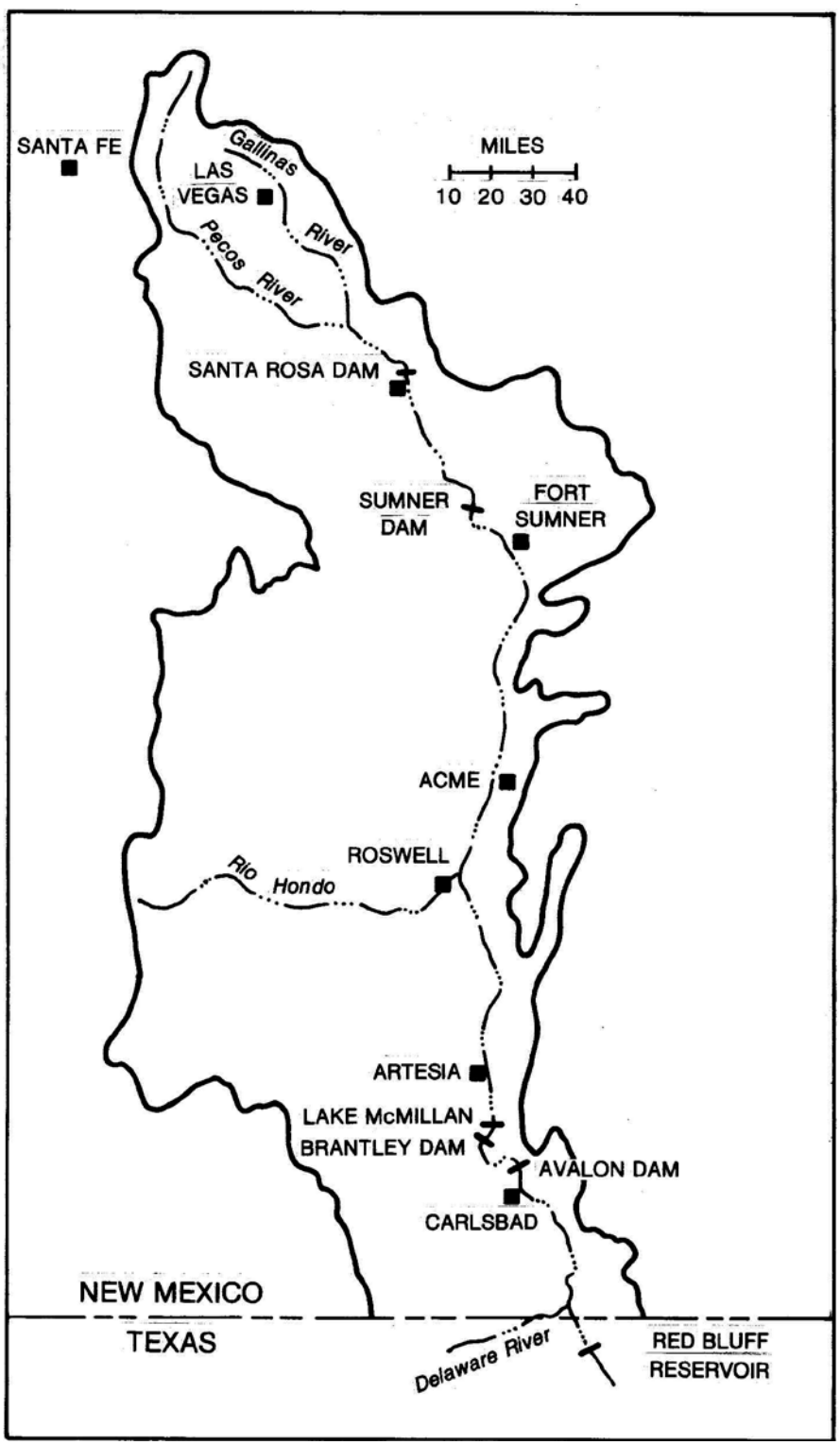

Map of Pecos River Basin Showing Accounting Reaches

PECOS RIVER COMPACT
Supreme Court of the United States
No. 65, Original
Amended Decree

Final Report of the River Master
Water Year 2018 - Accounting Year 2019
June 24, 2019

Purpose of the Report. In its Amended Decree issued March 28, 1988 the Supreme Court of the United States appointed a River Master of the Pecos River and directed him to "... Deliver to the parties a Preliminary Report setting forth the tentative results of the calculations required by Section III.B.1 of this Decree by May 15 of the accounting year..." and to consider "... any written objections to the Preliminary Report submitted by the parties prior to June 15 of the accounting year..." and to deliver "... to the parties a Final Report setting forth the final results of the calculations required by Section III.B.1 of this Decree by July 1 of the accounting year." This is the required Final Report with the determination of:

a. The Article III(a) obligation;

b. Any shortfall or overage, which calculation shall disregard deliveries of water pursuant to an Approved Plan;

c. The net shortfall, if any, after subtracting any overages accumulated in previous years, beginning with water year 1987.

Result of Calculations and Statement of Shortfall or Overage. The results of the calculations in this Final Report show that New Mexico's delivery in Water Year 2018 was an overage of 5,300 acre-feet. The accumulated overage since the beginning of Water Year 1987 is 176,100 acre-feet.

Neil S. Grigg

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River Master of the Pecos River

Pecos River Compact		
Accumulated Shortfall or Overage		
	June 23, 2019	
Water Year	Annual Overage or Shortfall, AF	Accumulated Overage or Shortfall, AF
1987	15,400	15,400
1988	23,600	39,000
1989	2,700	41,700
1990	-14,100	27,600
1991	-16,500	11,100
1992	10,900	22,000
1993	6,600	28,600
1994	5,900	34,500
1995	-14,100	20,400
1996	-6,700	13,700
1997	6,100	19,800
1998	1,700	21,500
1999	1,400	22,900
2000	-12,300	10,600
2001	-700	9,900
2002	-3,000	6,900
2003	2,000	8,900
2004	8,300	17,200
2005	24,000	41,200
2006	26,100	67,300
2007	25,200	92,500
2008	6,000	98,500
2009	1,600	100,100
2010	-500	99,600
2011	500	100,100
2012	1,900	102,000
2013	-6,300	95,700
2014	700	96,400
2015	27,300	123,700
2016	27,200	150,900
2017	19,900	170,800
2018	5,300	176,100

Table 1. General Calculation of Annual Departures in TAF (B.1)			
Water Year	2018		
6/23/2019			
	WY 2016	WY 2017	WY 2018
B.1.a. Index Inflows			
(1) Annual flood inflow			
(a) Gaged flow Pecos R bel Alamogordo Dam	128.6	89.7	97.7
(b) Flood Inflow Alamogordo - Artesia (Table 2)	-2.6	33.0	5.3
(c) Flood Inflow Artesia - Carlsbad (Table 3)	15.3	13.1	9.8
(d) Flood Inflow Carlsbad - State Line (Table 4)	9.5	6.2	5.6
Total (annual flood inflow)	150.8	142.0	118.4
(2) Index Inflow (3-year avg)			137.1
B.1.b. 1947 Condition Delivery Obligation			53.9
(Index Outflow)			
B.1.c. Average Historical (Gaged) Outflow			
(1) Annual historical outflow			
(a) Gaged Flow Pecos River at Red Bluff NM	75.4	46.9	42.6
(b) Gaged Flow Delaware River nr Red Bluff NM	6.2	3.3	1.8
(c) Metered diversions Permit 3254 into C-2713	0.2	0.4	0.4
Total Annual Historical Outflow	81.8	50.6	44.8
(2) Average Historical Outflow (3-yr average)			59.1
B.1.d. Annual Departure			5.2
C. Adjustments to Computed Departure			
1. Adjustments for Depletions above Alam Dam			
a. Depletions Due to Irrigation (Table 5)	1.3	-1.0	0.6
b. Depl fr Operation of Santa Rosa Reservoir (Table 6)	-6.3	9.2	0.6
c. Transfer of Water Use to Upstream of AD	0	0	
Recomputed Index Inflows			
(1) Annual flood inflow			
(a) Gaged flow Pecos R bel Alamogordo Dam	123.6	97.9	98.9
(b) Flood Inflow Alamogordo - Artesia	-2.6	33.0	5.3
(c) Flood Inflow Artesia - Carlsbad	15.3	13.1	9.8
(d) Flood Inflow Carlsbad - State Line	9.5	6.2	5.6
Total (annual flood inflow)	145.8	150.2	119.6
Recomputed Index Inflow (3-year avg)			138.5
Recomputed 1947 Condition Del Outflow			54.7
(Index Outflow)			
Recomputed Annual Departures			4.4
Credits to New Mexico			
C.2 Depletions Due to McMillan Dike			1.0
C.3 Salvage Water Analysis			0
C.4 Unappropriated Flood Waters			0
C.5 Texas Water Stored in NM Reservoirs			0
C.6 Beneficial C.U. Delaware River Water			0
Final Calculated Departure, TAF			5.3

Table 2. Determination of Flood Inflows, Alamogordo Dam to Artesia (B.3)													
Water Year	2018												
5/4/2019													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
Flow bel Sumner Dam	1.4	2.5	4.1	15.8	4.8	5.6	39.4	4.3	16.2	2.5	0.3	0.9	97.7
FtSumner Irrig Div	0.0	1.6	4.3	4.8	5.1	6.0	4.9	3.3	3.6	1.5	0.0	0.0	35.3
Ft Sumner ID Return	0.7	0.6	1.3	1.5	2.2	2.2	2.2	2.2	2.1	1.9	0.9	0.7	18.7
Flow past FS IDist	2.1	1.5	1.3	12.5	2.2	2.2	36.7	3.2	14.6	2.8	1.2	1.6	82.1
Channel loss	0.2	0.2	0.5	2.6	1.4	1.1	5.7	1.6	2.3	0.9	0.6	0.2	17.2
Residual Flow	1.9	1.3	0.8	10.0	0.9	1.1	31.0	1.6	12.2	2.0	0.6	1.5	64.8
Base Inflow	2.5	2.3	2.1	1.5	1.3	0.6	0.1	0.4	0.6	1.5	2.0	2.1	17.1
River Pump Divers	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5
Residual, Artesia	4.4	3.6	2.9	11.4	2.0	1.6	31.1	2.0	12.8	3.5	2.6	3.5	81.4
Pecos Flow Artesia	5.1	4.5	3.2	7.8	5.7	1.7	23.8	2.8	14.6	8.7	4.9	4.1	86.7
Flood Inflow, AD-Art	0.6	0.8	0.3	-3.7	3.6	0.1	-7.2	0.8	1.8	5.2	2.3	0.5	5.3

Note: Whenever the computed flow past the District is less than the return flow, set the flow past the District equal to the return flow (Manual, B.3.d).

Table 3. Determination of Flood Inflows, Artesia to Carlsbad (B.4)													
Water Year	2018												
6/23/2019													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
Rio Penasco at Dayton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fourmile Draw nr Lakew	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Seven Rivers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rocky Arroyo at Hwy Br	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Flood Inflow, Art-DS3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2
Pecos R at Dam Site 3	0.0	0.5	10.1	12.7	9.7	15.2	12.0	10.2	6.4	3.1	0.0	0.1	80.1
CB Sprgs New Water (from Table 7)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Total Inflow, DS3 - CB	0.0	0.5	10.1	12.7	9.7	15.2	12.0	10.2	6.4	3.1	0.0	0.1	80.1
Evap Loss, Lake Avalon (from Table 10)	0.0	0.0	0.5	0.6	0.8	0.7	0.7	0.5	0.2	0.1	0.0	0.0	4.1
Storage Chg, Lake Avalon (from Table 11)	0.0	0.0	2.2	0.4	-0.5	0.3	0.2	-0.5	-0.4	-0.4	-1.3	0.0	0.0
Carls ID diversions	0.0	0.0	5.6	11.6	9.0	13.4	10.9	10.5	6.1	3.4	1.7	0.0	72.2
93% CID diver	0.0	0.0	5.2	10.8	8.4	12.5	10.2	9.8	5.6	3.1	1.5	0.0	67.1
Other depletions	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	1.4
Dark Canyon at Csbad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pecos b Dark Canyon	1.3	1.5	1.4	1.3	1.3	1.3	1.4	1.6	1.5	1.7	1.5	1.3	17.1
Pecos R at Carlsbad	1.3	1.5	1.4	1.3	1.3	1.3	1.4	1.6	1.5	1.7	1.5	1.3	17.1
Total Outflow	1.4	1.6	9.5	13.1	10.1	14.9	12.6	11.7	7.0	4.6	1.8	1.4	89.7
Flood Inflow, DS3-CB	1.4	1.1	-0.6	0.5	0.4	-0.4	0.6	1.4	0.6	1.5	1.8	1.4	9.6
Flood Inflow, Art-CB	1.4	1.1	-0.6	0.5	0.4	-0.4	0.7	1.4	0.6	1.5	1.8	1.4	9.8

Table 4. Summary Table for Computations, Carlsbad to State Line (B.5)						
Water Year		2018				
6/23/2019						
		BCB - RB		Del R	DC	
		RM				
Jan		0.0		0.0	0.0	
Feb		0.0		0.0	0.0	
Mar		0.0		0.0	0.0	
Apr		0.0		0.0	0.0	
May		0.0		0.0	0.0	
Jun		0.1		0.0	0.0	
Jul		0.3		0.0	0.0	
Aug		0.6		0.0	0.0	
Sep		1.4		0.3	0.0	
Oct		2.2		0.4	0.0	
Nov		0.0		0.0	0.0	
Dec		0.1		0.0	0.0	
Total		4.8		0.7	0.0	
Summary of flood inflows, Carlsbad to State Line, TAF						
Red Bluff - Carlsbad + Dark C RM calcs)						4.8
Delaware River						0.7
Total Flood Inflow, Carlsbad to State Line						5.6

Table 5. Depletions Due to Irrigation Above Sumner Dam (C.1.a)								
Water Year	2018							
5/5/2019								
	APR	MAY	JUN	JUL	AUG	SEPT	OCT	TOTAL
Precip Las Vegas FAA AP	0.29	0.11	0.27	6.51	3.26	2.69	3.33	16.46
Eff prec Las Veg FAA AP	0.28	0.11	0.26	4.1	2.78	2.36	2.83	12.72
Precip Pecos Natl Monument	0	0.50	0.46	4.18	1.49	1.28	3.07	10.98
Eff Precip Pecos RS	0	0.49	0.45	3.42	1.40	1.21	2.64	9.61
Precip Santa Rosa	0.04	0.63	1.40	2.13	1.23	2.52	5.57	13.52
Eff Precip Santa Ro	0.04	0.62	1.32	1.93	1.17	2.23	3.99	11.30
Average eff precip, ft	0.01	0.03	0.06	0.26	0.15	0.16	0.26	0.93
Consumptive use, ft	0.19	0.36	0.36	0.30	0.27	0.18	0.11	1.77
Unit depletion rate (CU less eff precip), ft	0.18	0.33	0.30	0.04	0.12	0.02	0.00	0.99
Acres (most recent inventory)	11529							
Streamflow depletion (actual use), AF	11398							
1947 depletion, AF	10804							
Difference (actual use - 1947 depletion), TAF	0.6							
Adjustment to Gaged Flow, Pecos River below Sumner Dam, TAF =						0.6		

Table 6. Depletions Due to Santa Rosa Reservoir Operations (C.1.b)													
Water Year	2018												
4/21/2019													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
LS 2013 table (USBR), add 4,200 feet to value shown; LSR 1997 tables used (COE); Add 4,700 feet to value shown													
Lk Sumner ga ht, avg	62.65	63.35	63.21	61.56	56.95	55.70	54.73	54.33	52.25	52.36	54.82	56.67	
LS content, AF, avg	40444	42347	41961	37608	27241	24842	23079	22375	18929	19102	23240	26688	
LS area, acres, avg	2673	2764	2747	2530	1988	1857	1777	1744	1570	1580	1784	1956	
LS evap, inches	4.68	4.97	10.56	12.80	15.73	16.05	14.67	11.90	8.09	5.60	4.11	2.50	111.67
.77 LS Evap	3.60	3.83	8.13	9.86	12.11	12.36	11.30	9.16	6.23	4.31	3.16	1.93	85.98
LS Precip, inches	0.11	0.11	0.03	0.02	0.90	0.95	2.74	3.90	3.14	3.56	0.25	0.57	16.28
Net LS Evap, inches	3.49	3.72	8.10	9.84	11.21	11.41	8.56	5.26	3.09	0.75	2.91	1.36	69.70
LSum Evaploss, TAF	0.78	0.86	1.85	2.07	1.86	1.77	1.27	0.76	0.40	0.10	0.43	0.22	12.38
L S Rosa ga ht, avg	47.94	47.83	47.66	47.33	46.97	46.76	38.53	37.06	34.87	34.35	34.83	34.69	
LSR content, AF, avg	94499	94096	93476	92279	90985	90234	63714	59550	53668	52329	53564	53202	
LSR area, acres, avg	3673	3661	3643	3609	3575	3557	2889	2779	2596	2555	2593	2582	
LSR evap, inches	3.72	4.98	8.58	9.96	13.14	13.99	11.62	10.69	7.73	4.94	4.44	3.76	97.55
.77 LSR Evap	2.86	3.83	6.61	7.67	10.12	10.77	8.95	8.23	5.95	3.80	3.42	2.90	75.11
LSR precip, inches	0.05	0.11	0.21	0.04	0.63	1.40	2.13	1.23	2.52	5.57	0.47	1.84	16.20
Net LSR Evap, inches	2.81	3.72	6.40	7.63	9.49	9.37	6.82	7.00	3.43	-1.77	2.95	1.06	58.91
LSR Evaploss, TAF	0.86	1.14	1.94	2.29	2.83	2.78	1.64	1.62	0.74	-0.38	0.64	0.23	16.33
Total evaploss, TAF	1.64	1.99	3.80	4.37	4.68	4.54	2.91	2.39	1.15	-0.28	1.07	0.45	28.71
Sum contents, AF	134943	136443	135437	129887	118226	115076	86793	81925	72597	71431	76804	79890	
1947 area, acres	4600	4600	4600	4600	4258	4177	3432	3287	3090	3050	3164	3227	
1947 evaploss, TAF	1.34	1.43	3.11	3.77	3.98	3.97	2.45	1.44	0.80	0.19	0.77	0.37	23.60
current-1947evaploss	0.30	0.57	0.69	0.60	0.71	0.57	0.46	0.94	0.35	-0.47	0.30	0.08	5.11
						Annual adjustment for excess evaporation =							5.1
ADJUSTMENT FOR EXCESSIVE STORAGE IN SANTA ROSA RESERVOIR													
			2017	2017	2018	2018							
			Gage	Storage	Gage	Storage							
EndYear Sumner Sto			4262.13	39071	4257.59	28535							
EndYear S R Sto			4748.00	94720	4734.76	53382							
Sum				133791		81917							
Sto Adjustment, TAF						-4.5							
Adjustm Ex Evap, TAF						5.1							
Total Adjustment,TAF						0.6							
	Storage adjustment												
	Both equal or less than 129.3 TAF, adjustment is zero												
	Both greater than 129.3 TAF, subtract previous from current year												
	Current year less than 129.3 TAF, previous greater than 129.3 TAF, subtract previous year from 129.3 TAF												
	Current year greater than 129.3 TAF, previous year less than 129.3 TAF, subtract 129.3 TAF from current year												

Table 7. Carlsbad Springs New Water [B.4.c.(2)]					
Water Year	2018				
5/4/2019					
		TAF	AF/day	cfs	Totals
Pecos R bel DC		17.1	46.8	23.6	23.6
Dark Canyon		0.0	0.0	0.0	0.0
Pecos R bel Lake Avalon		0.0	0.0	0.0	0.0
Depletion, cfs					2.0
CID lag seep, cfs (from Table 8)					7.1
Return flow, cfs					1.0
Lake Av lagged seep, cfs (from Table 9)					14.6
PR seepage, cfs					3.0
Carls new water, cfs					-0.09
Carls new wat, TAF					-0.1
Carls new wat monthly, TAF					0.0

Table 8. Carlsbad Main Canal Seepage Lagged [B.4.c.(2)(e)]													
Water Year	2018												
5/4/2019													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
WY 2018													
CID, TAF	0	0	5.6	11.6	9.0	13.4	10.9	10.5	6.1	3.4	1.7	0.0	72.2
days/mo	31	28	31	30	31	30	31	31	30	31	30	31	365
cfs	0	0	90.9	195.1	147.0	225.2	177.5	170.8	101.9	54.9	27.9	0.0	99.3
cfs, qtr avg			31.3			188.7			150.6			27.6	
WY 2017		1Q	2Q	3Q	4Q								
FLOWS, cfs				147.0	40.5								
SEVEN %				10.3	2.8								
WY 2018 lagged		1Q	2Q	3Q	4Q								
FLOWS, cfs		31.3	188.7	150.6	27.6								
SEVEN %		2.2	13.2	10.5	1.9								
LAG		3.8	7.8	10.0	6.7	Avg =	7.1	cfs					

Table 9. Lake Avalon Leakage Lagged [B.4.c.(2)(g)]													
Water Year	2018												
5/4/2019													
WY 2018	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
Elev NM rept	60.0	60.0	75.3	74.1	74.4	74.1	75.0	74.4	74.8	74.1	65.3	60.0	
ga ht, avg*	3.0	3.0	18.3	17.1	17.4	17.1	18.0	17.4	17.8	17.1	8.3	3.0	
cfs	0.0	0.0	25.4	19.9	21.4	19.7	24.1	20.9	22.9	19.7	0.0	0.0	
days	31	28	31	30	31	30	31	31	30	31	30	31	365
cfs avg	8.7			20.3			22.7			6.6			14.6
WY 2017		1Q	2Q	3Q	4Q								
cfs				22.1	6.6								
WY 2018 lagged		1Q	2Q	3Q	4Q								
cfs		8.7	20.3	22.7	6.6								
lag cfs		10.3	14.2	19.6	14.3	Avg =	14.6	cfs					
* Computed as WS elev by NM Report minus Gage datum at 3157.0 (USBR datum)													

Table 10. Evaporation Loss at Lake Avalon [B.4.d.(1)]														
Water Year	2018													
5/4/2019														
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT	
Av WS NM Rept	60.00	60.00	75.28	74.13	74.45	74.09	75.01	74.35	74.77	74.09	65.35	60.00		
Avalon ga ht, avg, ft*	3.00	3.00	18.28	17.13	17.45	17.09	18.01	17.35	17.77	17.09	8.35	3.00		
Avg area Avalon, ac**	0	0	808	699	732	699	797	732	775	699	1	0		.
Panevap Brantley, in.	4.65	5.60	9.97	12.94	16.93	17.51	15.48	12.30	7.83	6.24	4.80	4.34	118.59	
Lakeevap Brantley, in.	3.58	4.31	7.68	9.96	13.04	13.48	11.92	9.47	6.03	4.80	3.70	3.34	91.31	
Precip Brantley, in.	0.01	0.19	0.08	0.01	0.03	0.78	1.57	1.01	2.38	3.49	0.23	0.50	10.28	
Netevap, inches	3.57	4.12	7.60	9.95	13.01	12.70	10.35	8.46	3.65	1.31	3.47	2.84	81.03	
Evaploss Av, TAF	0.00	0.00	0.51	0.58	0.79	0.74	0.69	0.52	0.24	0.08	0.00	0.00	4.14	
* Computed as WS elev by NM Report minus Gage datum at 3157.0 (USBR datum)														
** Based on 2006 USBR Area and Capacity Table														

Table 11. Change in Storage, Lake Avalon [B.4.d.(2)]														
(Gage heights are end of month)														
Water Year	2018													
3/24/2019														
	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
	2017	2018												
WS NM Rept	60.0	60.0	60.0	74.7	75.2	74.6	75.0	75.2	74.6	74.0	73.4	60.0	60.0	
Gage EOM, ft*	3.0	3.0	3.0	17.7	18.2	17.6	18.0	18.2	17.6	17.0	16.4	3.0	3.0	
Storage, AF**	0	0	0	2223	2617	2147	2457	2617	2147	1715	1323	0	0	
Change sto, TAF		0.0	0.0	2.2	0.4	-0.5	0.3	0.2	-0.5	-0.4	-0.4	-1.3	0.0	0.0
* Computed as WS elev by NM Report minus Gage datum at 3157.0 (USBR datum)														
** Based on 2006 USBR Area and Capacity Table														

Table 12. Data Required for River Master Manual Calculations													
Water Year 2018													
5/4/2019	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
.													
STREAMFLOW GAGING RECORDS, TAF													
Pecos R b Sumner Dam	1.4	2.5	4.1	15.8	4.8	5.6	39.4	4.3	16.2	2.5	0.3	0.9	97.7
Fort Sumner Main C	0.0	1.6	4.3	4.8	5.1	6.0	4.9	3.3	3.6	1.5	0.0	0.0	35.3
Pecos R nr Artesia	5.1	4.5	3.2	7.8	5.7	1.7	23.8	2.8	14.6	8.7	4.9	4.1	86.7
Rio Penasco at Dayton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fourmile Draw nr Lakewood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Seven Rivers nr Lkwd	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rocky Arroyo at Hwy Br nr	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Pecos R at Dam Site 3	0.0	0.5	10.1	12.7	9.7	15.2	12.0	10.2	6.4	3.1	0.0	0.1	80.1
Pecos bel Avalon Dam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carlsbad Main Canal	0.0	0.0	5.6	11.6	9.0	13.4	10.9	10.5	6.1	3.4	1.7	0.0	72.2
Dark Canyon at Carlsbad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pecos below Dark Canyon	1.3	1.5	1.4	1.3	1.3	1.3	1.4	1.6	1.5	1.7	1.5	1.3	17.1
Pecos R at Red Bluff	3.8	2.9	2.5	3.0	2.3	2.3	3.1	3.4	4.5	6.0	4.8	4.0	42.6
Delaware R nr Red Bluff	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.6	0.1	0.1	1.8
GAGE HEIGHTS													
Avalon gage ht, end mo	60.0	60.0	74.7	75.2	74.6	75.0	75.2	74.6	74.0	73.4	60.0	60.0	
Avalon gage ht, avg	60.0	60.0	75.3	74.1	74.4	74.1	75.0	74.4	74.8	74.1	65.3	60.0	
Sumner Lake ga ht, end mo	63.1	63.4	62.9	57.4	56.5	54.7	54.1	54.2	51.9	53.6	55.8	57.6	
Sumner Lake gage ht, avg	62.7	63.4	63.2	61.6	56.9	55.7	54.7	54.3	52.3	52.4	54.8	56.7	
Lake S Rosa ga ht, end mo	47.9	47.8	47.6	47.1	47.0	46.5	36.8	37.1	34.3	34.9	34.8	34.8	
Lake S Rosa ga ht, avg	47.9	47.8	47.7	47.3	47.0	46.8	38.5	37.1	34.9	34.3	34.8	34.7	
PRECIPITATION, INCHES													
Brantley Lake	0.01	0.19	0.08	0.01	0.03	0.78	1.57	1.01	2.38	3.49	0.23	0.50	10.28
Las Vegas FAA AP	0.00	0.19	0.20	0.29	0.11	0.27	6.51	3.26	2.69	3.33	0.10	0.72	17.67
Pecos National Monument	0.62	2.05	0.71	0.00	0.50	0.46	4.18	1.49	1.28	3.07	5.55	0.71	20.62
Santa Rosa	0.05	0.11	0.21	0.04	0.63	1.40	2.13	1.23	2.52	5.57	0.47	1.84	16.20
Lake Santa Rosa	0.05	0.11	0.21	0.04	0.63	1.40	2.13	1.23	2.52	5.57	0.47	1.84	16.20
Sumner Lake	0.11	0.11	0.03	0.02	0.90	0.95	2.74	3.90	3.14	3.56	0.25	0.57	16.28
PAN EVAPORATION, INCHES													
Lake Santa Rosa	3.72	4.98	8.58	9.96	13.14	13.99	11.62	10.69	7.73	4.94	4.44	3.76	97.6
Lake Sumner	4.68	4.97	10.56	12.80	15.73	16.05	14.67	11.90	8.09	5.60	4.11	2.50	111.7
Brantley Lake	4.65	5.60	9.97	12.94	16.93	17.51	15.48	12.30	7.83	6.24	4.80	4.34	118.6
OTHER REPORTS													
Base Acme-Art, TAF (USGS)	2.5	2.3	2.1	1.5	1.3	0.6	0.1	0.4	0.6	1.5	2.0	2.1	17.1
Pump depl Ac-Artesia, TAF	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.5
Pumping, C-2713, Malaga B													0.4
NM irrig inv, acres (3/9/2000)													11529
NM Transfer water use, TAF													
NM salvaged water, TAF													0.00
Texas, water stored NM, TAF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Texas, use Del water, TAF													

APPENDIX A

RESPONSE TO STATES' OBJECTIONS

RESPONSE TO STATES' OBJECTIONS

Final Report, Accounting Year 2019

NEW MEXICO OBJECTIONS

I. Table 3. USGS Carlsbad Main Canal at Head Near Carlsbad, NM Gage Data

NM noted that incorrect data were used in the Preliminary Report for April, May, June, August, September, October and November for the Carlsbad Main Canal gage. TX discovered the same error. This objection is accepted and the correction has been made.

II. Accumulated Shortfall or Overage Table

NM noted that the Table of Annual and Accumulated Overage or Shortfall contains a one-time credit of 16,600 AF for Water Year 2017 that is the subject of a motion by Texas before the U.S. Supreme Court. No changes in the Preliminary Report are required to respond to this issue at this time.

TEXAS OBJECTIONS

1. Table 3. Determination of Flood Inflows, Artesia to Carlsbad [B.4]

This objection has been accepted, see NM Objection I above.

2. Table 4. Summary Table for Computations, Carlsbad to State Line [B.5]

TX noted that in the River Master's spreadsheet, the scalped flood flows marked on the plotted hydrographs for August 9-16 and 20-26 were omitted. This objection is accepted. The River Master recomputed 0.32 TAF for the flood inflows of these periods and added it to Table 4.

TX noted rain events detected by gages other than those reported by NM. The River Master examined Texas' Exhibit E and noted all periods where rain was detected other than the same periods detected by the three gages used in the Preliminary Report. As required by B.5 of the River Master's Manual, the hydrographs at Dark Canyon Draw, Black River, and Delaware River were studied. They did not show any distinct rises in the periods noted by Texas. Also, the gages added by Texas are far distant from the Carlsbad to Red Bluff reach, and some are to the east where the land is flat and less likely to contribute runoff to the reach than nearby steeper and rockier land. One notable example is the gage at Hobbs, which is apparently some 50 miles from the river. A rainfall of 0.65 inches on July 2 seems significant, but no rain was detected on any other gage and the hydrograph rise beginning July 1 seems unlikely to result from this isolated storm so far away on flat land with unclear paths to the reach. A similar conclusion was

reached about the 1.38 inch rainfall at WIPP on August 14. The hydrograph at Red Bluff is declining at that time. For the foregoing reasons, Texas' objection concerning runoff from rains measured by the additional rain gages is rejected.

3. Table 1. General Calculation of Annual Departures in TAF for WY 2018

The final departure has been modified as a result of changes noted above in Tables 3 and

FINAL CALCULATED DEPARTURE

The Preliminary Report had a Final Calculated Departure as an overage of 5.7 TAF. After considering the states' objections, the Final Determination is an overage of 5.3 TAF.