Appendix G

Summary of System Runs

Table G-1
Summary of Operation Runs

Stand-Alone Runs

Run ID	Cons. Pool Chapman	Minimum Patman	Conservation Pool in Patman	Other description	Pump. Capacity (MGD)	Yield Chapman (ac-ft/year)	Yield Patman (ac-ft/year)	Yield System (ac-ft/year)
C-1	440.0	215.25	Interim	Stand-alone yield in Chapman	-	128,600	N/A	N/A
I-1	440.0	220.00	Interim	Maximum yield in Patman	-	128,600	8,974	137,574
I-2	440.0	217.50	Interim	Maximum yield in Patman	-	128,600	104,397	232,997
I-3	440.0	215.25	Interim	Maximum yield in Patman when Chapman operating at 128,600	-	128,600	154,205	282,805
U-1	440.0	220.00	Ultimate	Maximum yield in Patman	-	128,600	184,591	313,191
U-2	440.0	217.50	Ultimate	Maximum yield in Patman	-	128,600	255,194	383,794
U-3	440.0	215.25	Ultimate	Maximum yield in Patman	-	128,600	301,580	430,180
U-3a	440.0	215.25	Ultimate Stair-step	Maximum yield in Patman	-	128,600	301,450	430,050
F23-1	440.0	220.00	Flat at 223.0	Maximum yield in Patman	-	128,600	0	128,600
F25-1	440.0	220.00	Flat at 225.0	Maximum yield in Patman	-	128,600	116,499	245,099
F27-1	440.0	220.00	Flat at 227.0	Maximum yield in Patman	-	128,600	211,414	340,014
F28-1	440.0	220.00	Flat at 228.64	Maximum yield in Patman	-	128,600	275,313	403,913
F23-2	440.0	215.25	Flat at 223.0	Maximum yield in Patman	-	128,600	163,331	291,931
F25-2	440.0	215.25	Flat at 225.0	Maximum yield in Patman	-	128,600	229,788	358,388
F27-2	440.0	215.25	Flat at 227.0	Maximum yield in Patman	-	128,600	300,489	429,089
F28-2	440.0	215.25	Flat at 228.64	Maximum yield in Patman	-	128,600	363,717	492,317

Table G-1 (cont.)

System Operation runs

Run ID	Cons. Pool Chapman	Minimum Patman	Conservation Pool in Patman	Other description	Pump. Capacity (MGD)	Yield Chapman (ac-ft/year)	Yield Patman (ac-ft/year)	Yield System (ac-ft/year)
I-3	440	215.25	Interim	Pumping only in flood pool	30	135,791	154,205	289,996
					60	141,855	154,205	296,060
					120	151,861	154,205	306,066
					200	164,597	154,205	318,802
					300	181,300	154,205	335,505
					400	191,496	154,205	345,701
					500	199,520	154,205	353,725
					600	208,800	154,205	363,005
11	440	220	Ultimate	Pumping only in flood pool	30	135,086	184,591	319,677
					60	141,150	184,591	325,741
					120	150,628	184,591	335,219
					200	161,510	184,591	346,101
					300	172,980	184,591	357,571
					400	180,040	184,591	364,631
					500	187,279	184,591	371,870
					600	193,973	184,591	378,564
12	440	220	Flat = 225.0	Pumping only in flood pool	30	135,890	116,384	252,274
					60	142,632	116,384	259,016
					120	153,261	116,384	269,645
					200	164,468	116,384	280,852
					300	180,100	116,384	296,484
					400	188,820	116,384	305,204
					500	198,034	116,384	314,418
					600	206,913	116,384	323,297
13	440	220	Ultimate	Reducing releases by 500 cfs in Patman	300	173,827	184,591	358,418
				Reducing releases by 1000 cfs in Patman	300	176,013	184,591	360,604
				Reducing releases by 2000 cfs in Patman	300	178,000	184,591	362,591
				Reducing releases by 3000 cfs in Patman	300	179,652	184,591	364,243
U-1	440	220	Ultimate	Zones are varied to maximize yield	60	161,100	184,000	345,100
					120	177,200	183,600	360,800
					200	193,000	183,200	376,200
					300	203,900	183,200	387,100
					400	211,180	182,800	393,980
					500	221,981	180,100	402,081
					600	228,850	181,300	410,150

Table G-1 (cont.)

System Operation runs

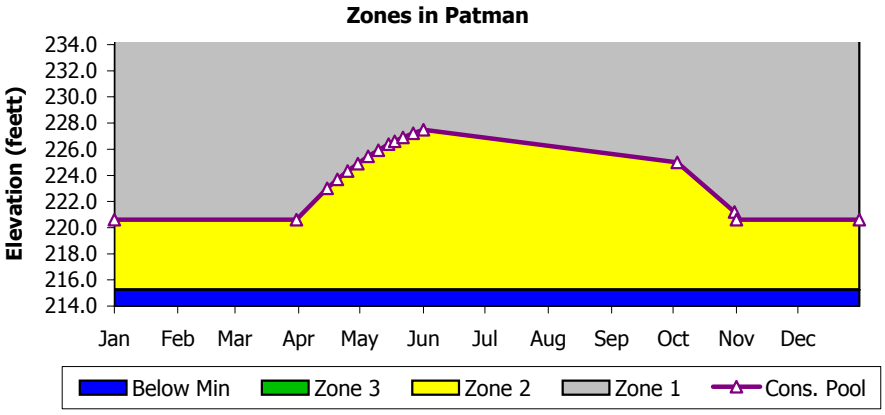
Run ID	Cons. Pool Chapman	Minimum Patman	Conservation Pool in Patman	Other description	Pump. Capacity (MGD)	Yield Chapman (ac-ft/year)	Yield Patman (ac-ft/year)	Yield System (ac-ft/year)
U-3	440	215.25	Ultimate	Zones are varied to maximize yield	60	153,600	301,580	455,180
					100	168,600	301,580	470,180
					200	186,600	301,580	488,180
					300	202,600	293,615	496,215
16	440	215.25	Flat at 225.0	Zones are varied to maximize yield	60	151,214	229,788	381,002
					120	172,600	229,788	402,388
					200	193,400	229,788	423,188
					300	212,100	228,200	440,300
					400	221,300	228,200	449,500
					500	229,100	228,200	457,300
					600	236,800	227,500	464,300
F28-1	440	228	Max Flat = 228.64	Zones are varied to maximize yield	60	153,219	275,313	428,532
					100	171,100	275,313	446,413
					200	203,600	275,313	478,913
					300	216,600	271,845	488,445
F28-2	440	215.25	Max Flat = 228.64	Zones are varied to maximize yield	60	156,100	363,717	519,817
					120	180,500	363,717	544,217
					200	212,100	363,717	575,817
					300	237,539	363,717	601,256
I+50	440	220	Interim+50,000 ac-ft	Zones are varied to maximize yield	0	128,600	99,589	228,189
					60	172,100	99,589	271,689
					120	213,100	99,589	312,689
					200	236,100	99,589	335,689
					300	259,046	99,589	358,635
					400	281,356	99,589	380,945
					500	290,403	99,589	389,992
					600	307,185	99,589	406,774
C-2	TPWD Environ. Guidelines (corrected)	215.25	Max Flat = 228.64	Zones are varied to maximize yield	0	108,533	372,540	481,073
					60	137,633	372,540	510,173
					120	169,706	367,000	536,706
					200	200,533	364,000	564,533
					300	225,533	363,700	589,233

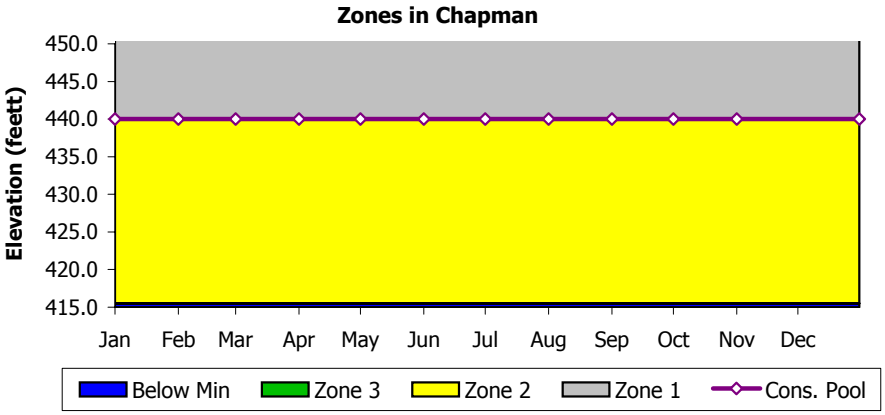
Figure G-1
Yield and Zones for System Run I-3

Run
I-3

Pumping Rates (% of Capacity)

		Zone in Patman		
		1	2	3
Zone in Chapman	1	0	0	0
	2	100	0	0
	3	100	0	0





Pumping Capacity mgd	Demand Patman ac-ft/year	Demand Chapman ac-ft/year	Additional Yield ac-ft/year	Yield of System ac-ft/year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	154,205	128,600	0	282,805	37,000	40,786
30	154,205	128,600	7,191	289,996	37,898	40,844
60	154,205	128,600	13,255	296,060	37,000	40,918
120	154,205	128,600	23,261	306,066	37,578	41,063
200	154,205	128,600	35,997	318,802	38,687	41,249
300	154,205	128,600	52,700	335,505	38,030	41,500
400	154,205	128,600	62,896	345,701	38,237	41,742
500	154,205	128,600	70,920	353,725	37,462	41,985
600	154,205	128,600	80,200	363,005	37,424	42,228

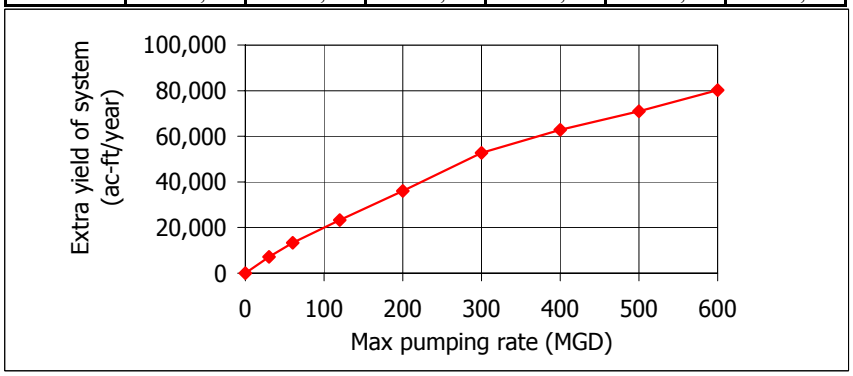
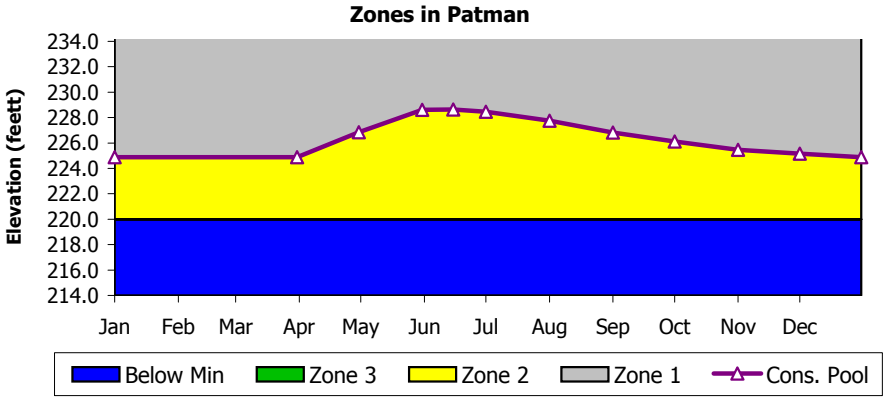


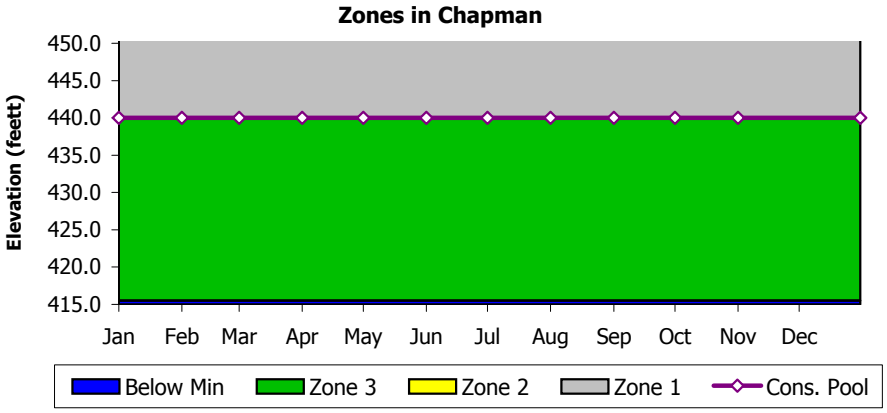
Figure G-2
Yield and Zones for System Run 11

Run 11

Pumping Rates (% of Capacity)

		Zone in Patman		
		1	2	3
Zone in Chapman	1	0	0	0
	2	100	0	0
	3	100	0	0





Pumping mgd	Demand Patman ac-ft-year	Demand Chapman ac-ft-year	Additional Yield ac-ft-year	Yield of System ac-ft-year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	184,591	128,600	0	313,191	37,000	110,900
30	184,591	128,600	6,486	319,677	37,308	111,112
60	184,591	128,600	12,550	325,741	37,308	111,112
120	184,591	128,600	22,028	335,219	37,244	111,272
200	184,591	128,600	32,910	346,127	37,246	111,423
300	184,591	128,600	44,380	357,801	37,562	111,688
400	184,591	128,600	51,440	364,631	37,402	112,015
500	184,591	128,600	58,679	371,870	37,299	112,280
600	184,591	128,600	65,373	378,564	37,259	112,546

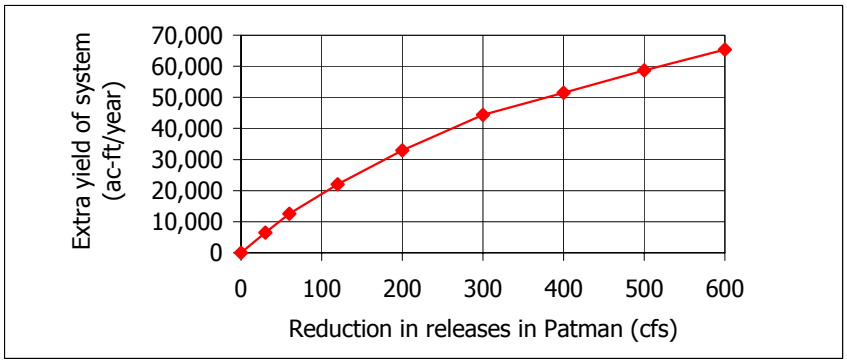
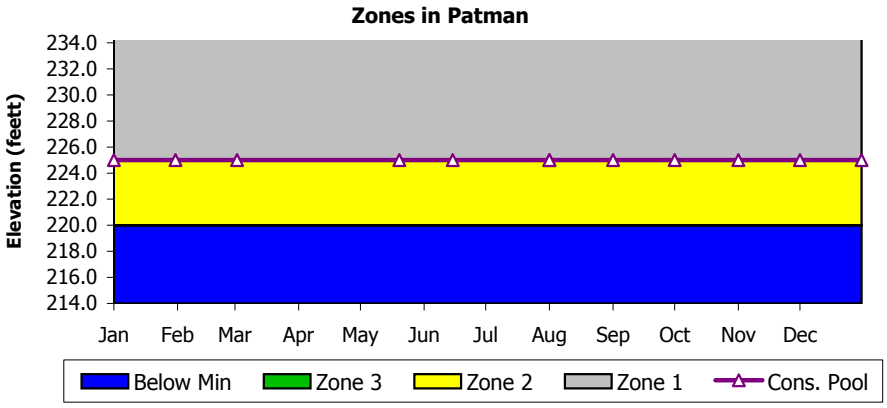


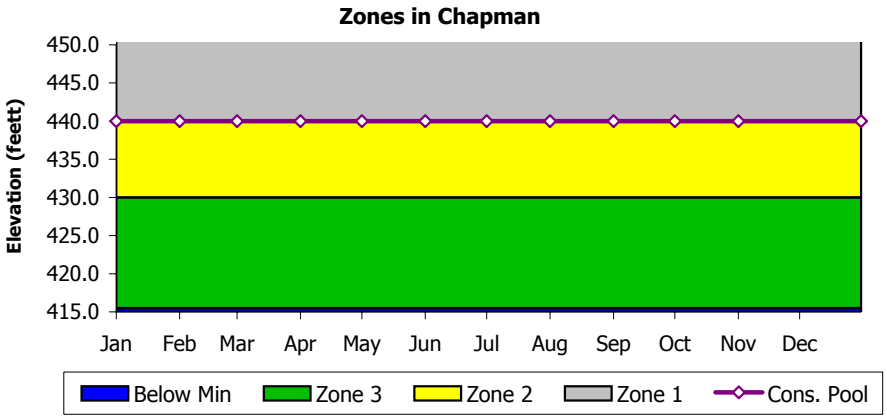
Figure G-3
Yield and Zones for System Run 12

Run 12

Pumping Rates (% of Capacity)

		Zone in Patman		
		1	2	3
Zone in Chapman	1	0	0	0
	2	100	0	0
	3	100	0	0





Pumping mgd	Demand Patman ac-ft-year	Demand Chapman ac-ft-year	Additional Yield ac-ft-year	Yield of System ac-ft-year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	116,384	128,600	0	244,984	37,245	110,900
30	116,384	128,600	7,290	252,274	37,320	110,900
60	116,384	128,600	14,032	259,016	37,242	110,900
120	116,384	128,600	24,661	269,645	37,243	110,900
200	116,384	128,600	35,868	280,852	37,307	110,900
300	116,384	128,600	51,500	296,484	37,000	110,900
400	116,384	128,600	60,220	305,204	37,000	110,900
500	116,384	128,600	69,434	314,418	37,245	110,900
600	116,384	128,600	78,313	323,297	37,245	110,900

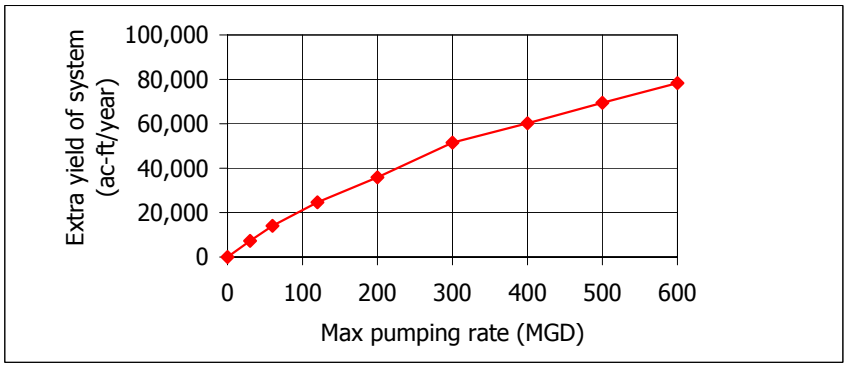
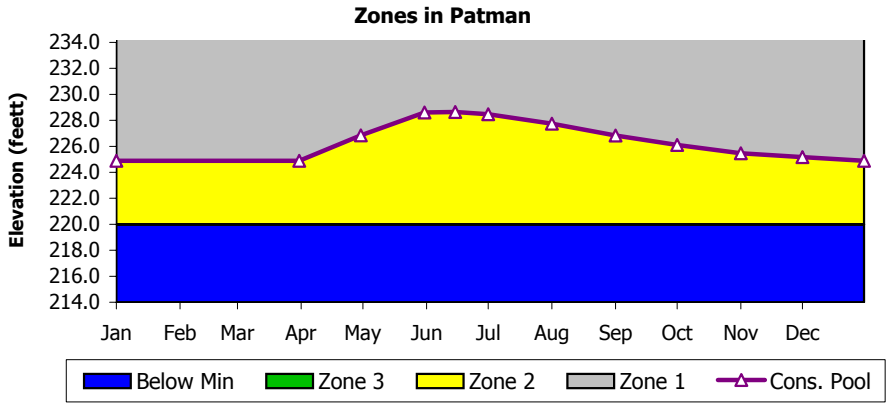


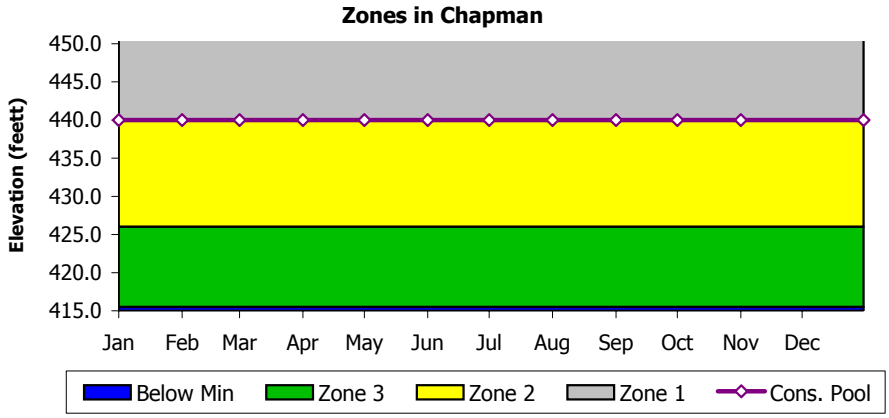
Figure G-4
Yield and Zones for System Run 13

Run 13

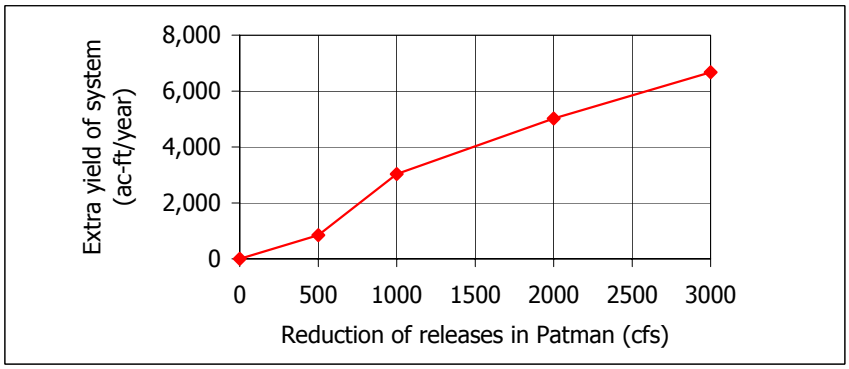
Pumping Rates (% of Capacity) [1]

		Zone in Patman		
		1	2	3
Zone in Chapman	1	0	0	0
	2	100	0	0
	3	100	0	0





Reduction in Release cfs	Demand Patman ac-ft-year	Demand Chapman ac-ft-year	Additional Yield [2] ac-ft-year	Yield of System ac-ft-year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	184,591	172,980	0	357,571	37,000	110,900
500	184,591	172,980	847	358,418	37,247	113,404
1000	184,591	172,980	3,033	360,604	37,381	113,677
2000	184,591	172,980	5,020	362,591	37,000	114,592
3000	184,591	172,980	6,672	364,243	37,000	115,568



[1] Pumping capacity = 300 MGD

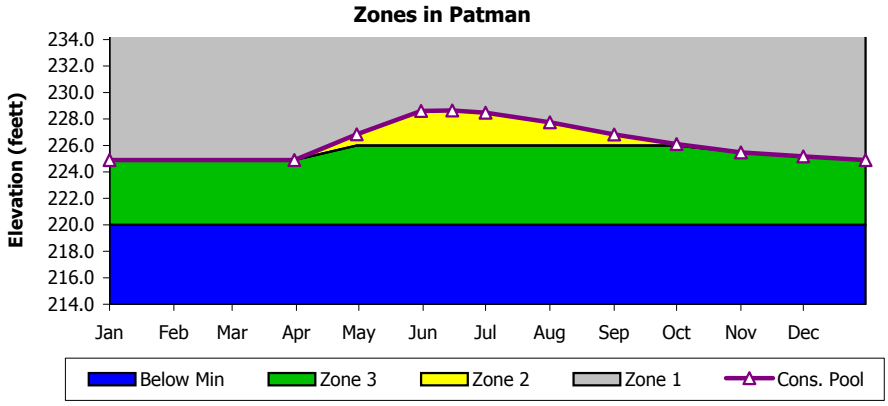
[2] Additional yield is relative to the yield obtained when pumping 300 MGD (See Run 11)

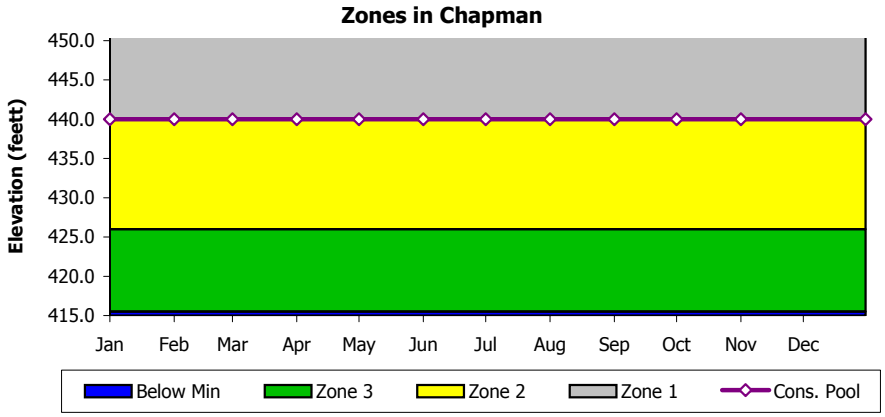
Figure G-5
Yield and Zones for System Run U-1

Run
U-1

Pumping Rates

		Zone in Patman		
		1	2	3
Zone in Chapman	1	0	0	0
	2	100%	50%	0
	3	100%	100 MGD	100 MGD





Pumping Capacity mgd	Demand Patman ac-ft-year	Demand Chapman ac-ft-year	Additional Yield ac-ft-year	Yield of System ac-ft-year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	184,591	128,600	0	313,191	37,000	110,900
60	184,000	128,600	32,500	345,100	37,434	110,913
120	183,600	128,600	48,600	360,800	37,333	110,900
200	183,200	128,600	64,400	376,200	37,321	110,900
300	183,200	128,600	75,300	387,100	38,221	110,900
400	182,800	128,600	82,580	393,980	37,401	110,900
500	180,100	128,600	93,381	402,081	37,286	110,933
600	181,300	128,600	100,250	410,150	37,318	111,203

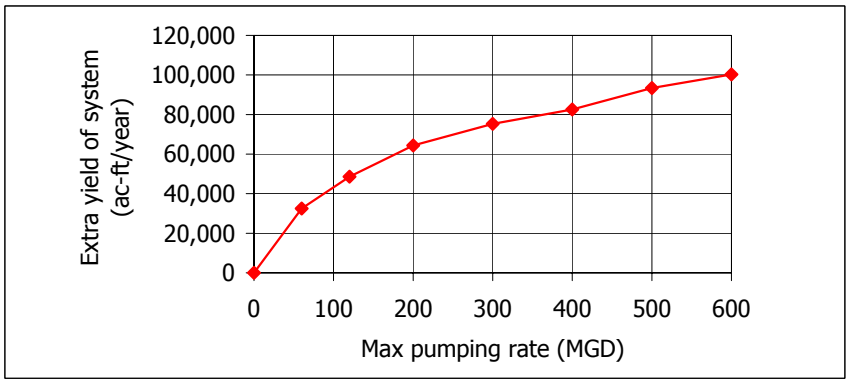
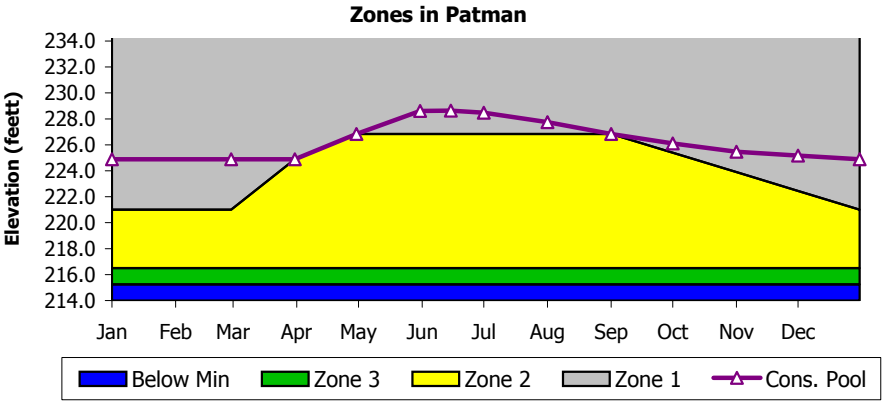
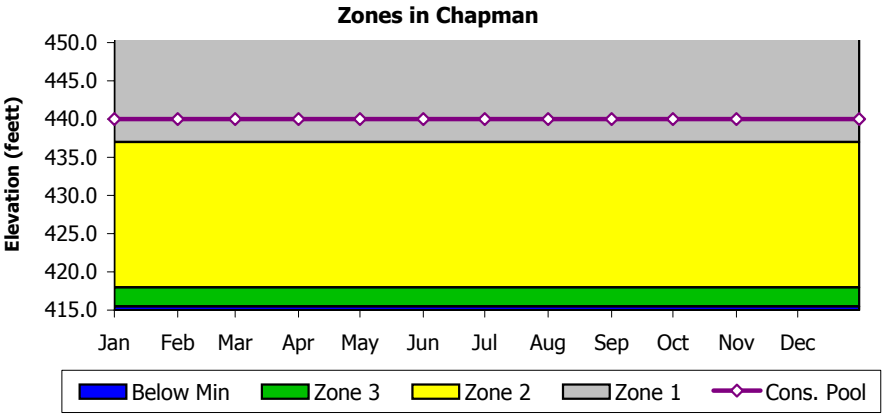


Figure G-6
Yield and Zones for System Run U-3

Pumping Rates (% of Capacity)

Run U-3		Zone in Patman 1	Zone in Patman 2	Zone in Patman 3
Zone in Chapman	1	0	0	0
	2	100	0	0
	3	100	100	0





Pumping Capacity mgd	Demand Patman ac-ft-year	Demand Chapman ac-ft-year	Additional Yield ac-ft-year	Yield of System ac-ft-year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	301,580	128,600	0	430,180	37,000	40,787
60	301,580	128,600	25,000	455,180	37,528	40,925
100	301,580	128,600	40,000	470,180	38,348	40,915
120	301,580	128,600	43,800	473,980	41,850	40,894
200	301,580	128,600	58,000	488,180	41,313	40,787
300	293,615	128,600	74,000	496,215	40,446	40,787

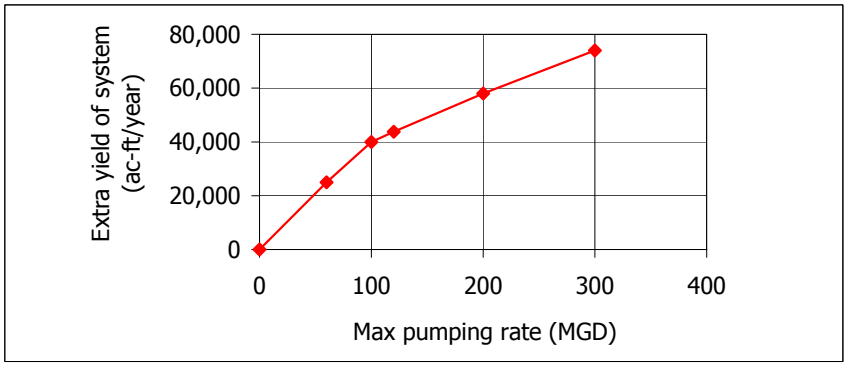
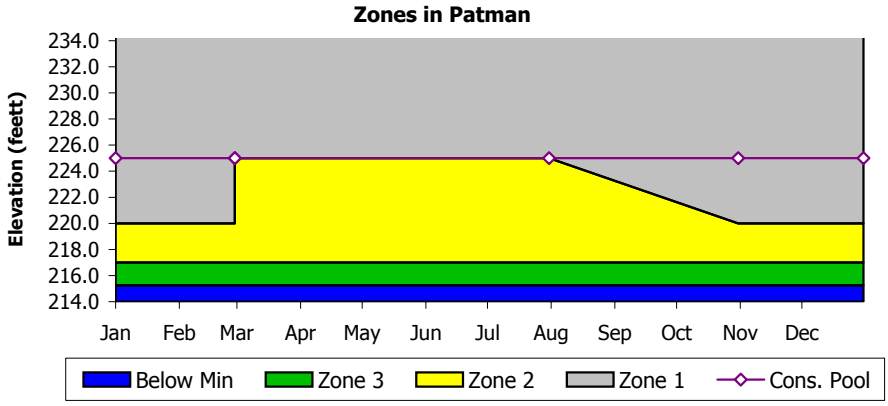


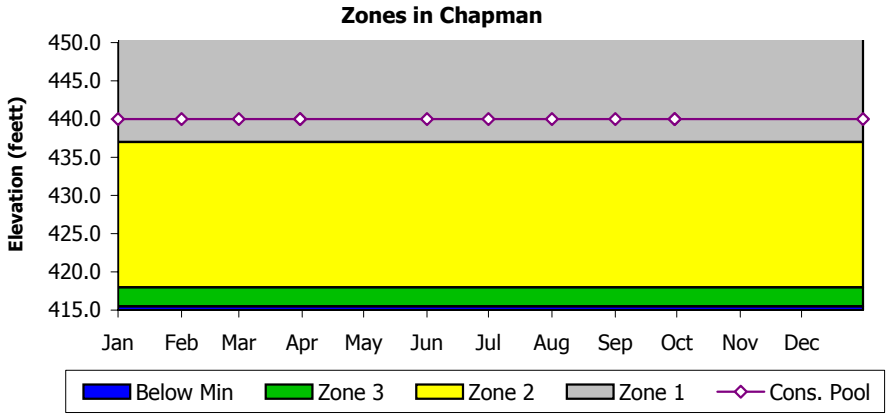
Figure G-7
Yield and Zones for System Run 16

Run 16

Pumping Rates (% of Capacity)

		Zone in Patman		
		1	2	3
Zone in Chapman	1	0	0	0
	2	100	0	0
	3	100	100	0





Pumping Capacity mgd	Demand Patman ac-ft-year	Demand Chapman ac-ft-year	Additional Yield ac-ft-year	Yield of System ac-ft-year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	229,788	128,600	0	358,388	37,260	40,787
60	229,788	128,600	22,614	381,002	37,301	40,787
120	229,788	128,600	44,000	402,388	37,359	40,787
200	229,788	128,600	64,800	423,188	37,709	40,787
300	228,200	128,600	83,500	440,300	37,684	40,809
400	228,200	128,600	92,700	449,500	37,757	40,894
500	228,200	128,600	100,500	457,300	37,866	41,088
600	227,500	128,600	108,200	464,300	37,446	41,357

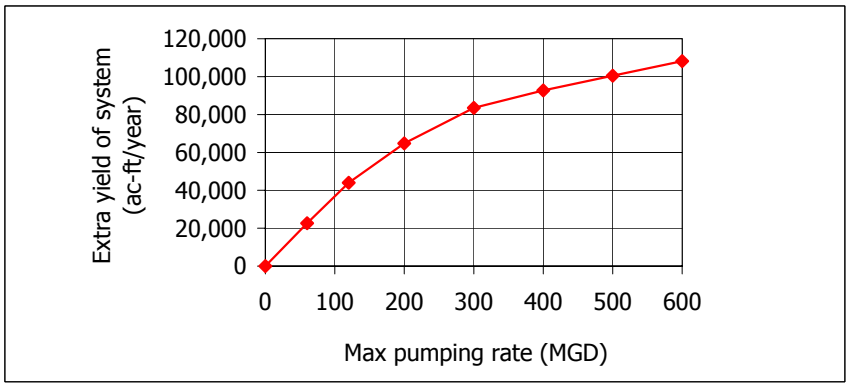
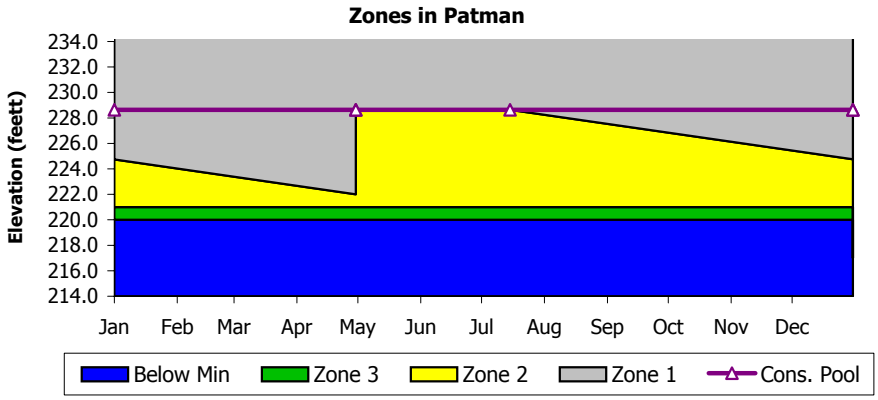


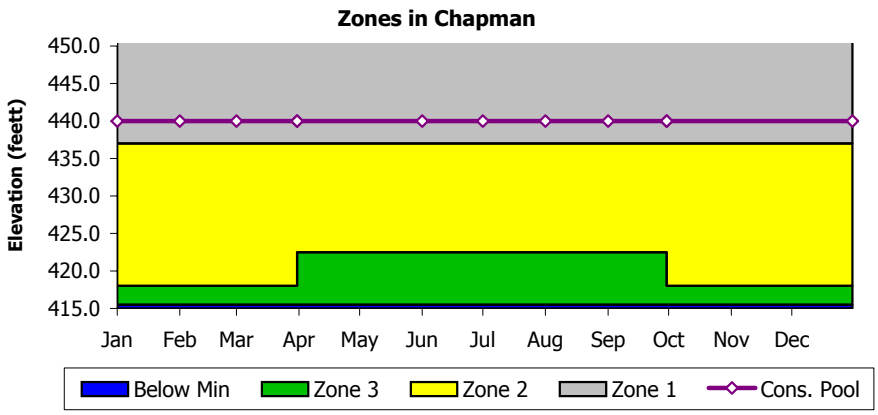
Figure G-8
Yield and Zones for System Run F28-1

Run F28-1

Pumping Rates (% of Capacity)

		Zone in Patman		
		1	2	3
Zone in Chapman	1	0	0	0
	2	100	0	0
	3	100	100	0





Pumping Capacity mgd	Demand Patman ac-ft-year	Demand Chapman ac-ft-year	Additional Yield ac-ft-year	Yield of System ac-ft-year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	275,313	128,600	0	403,913	37,000	110,900
60	275,313	128,600	24,619	428,532	37,244	110,900
100	275,313	128,600	42,500	446,413	37,525	110,900
120	275,313	128,600	51,386	455,299	37,253	110,900
200	275,313	128,600	75,000	478,913	37,306	110,900
300	271,845	128,600	88,000	488,445	38,561	110,900

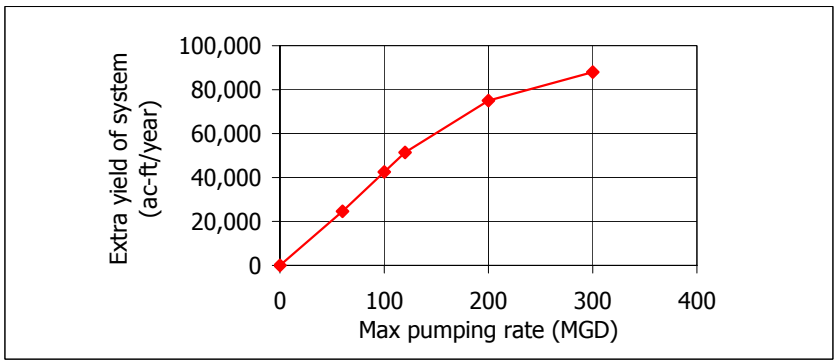
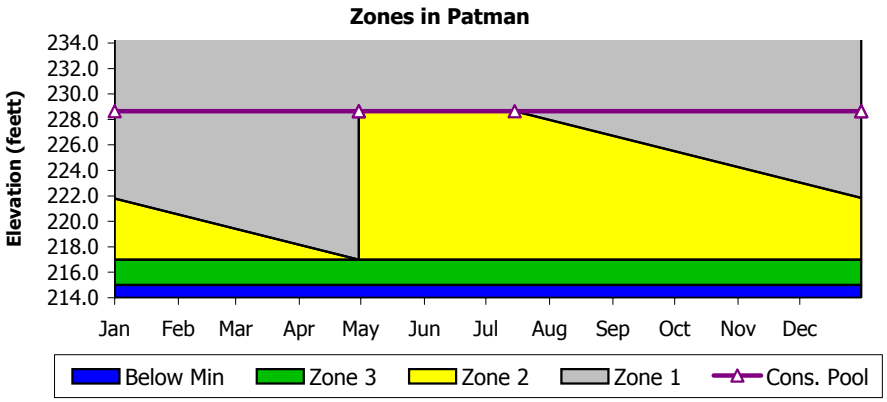


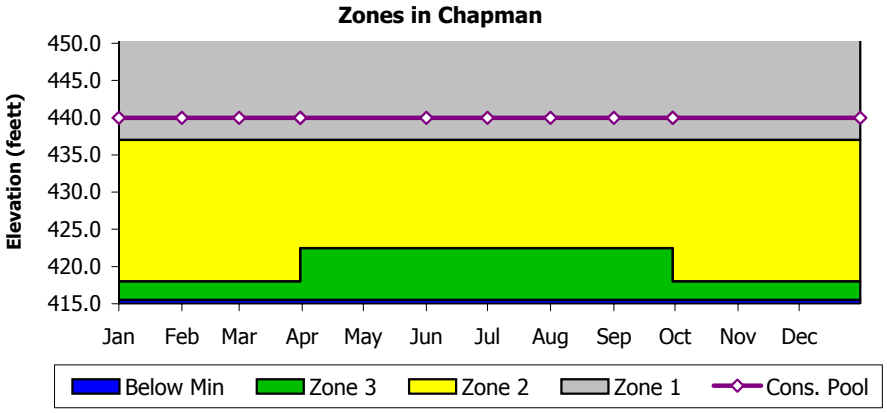
Figure G-9
Yield and Zones for System Run F28-2

Run
F28-2

Pumping Rates (% of Capacity)

		Zone in Patman		
		1	2	3
Zone in Chapman	1	0	0	0
	2	100	0	0
	3	100	100	0





Pumping Capacity mgd	Demand Patman ac-ft-year	Demand Chapman ac-ft-year	Additional Yield ac-ft-year	Yield of System ac-ft-year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	363,717	128,600	0	492,317	37,260	40,787
60	363,717	128,600	27,500	519,817	37,274	40,787
120	363,717	128,600	51,900	544,217	42,588	40,787
200	363,717	128,600	83,500	575,817	39,741	40,787
300	363,717	128,600	108,939	601,256	37,472	40,787

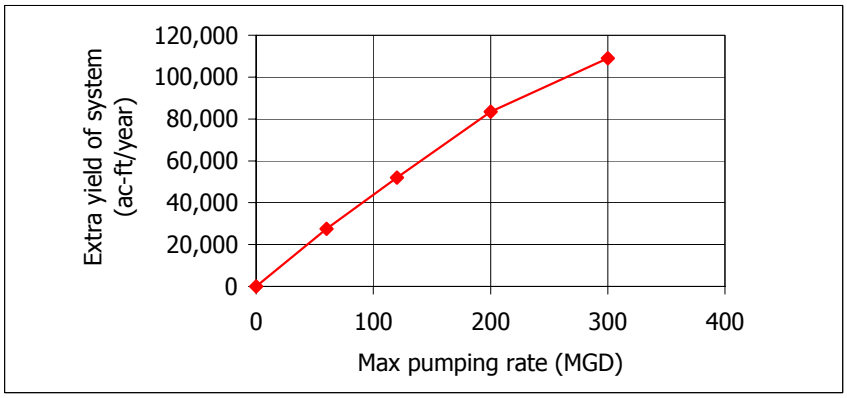
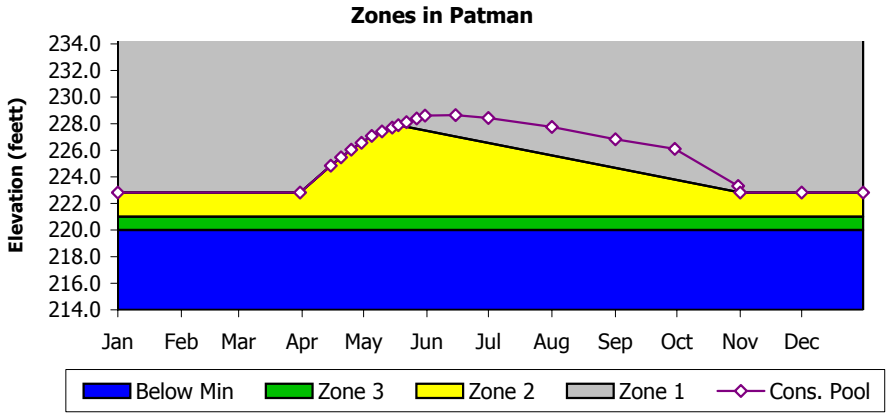
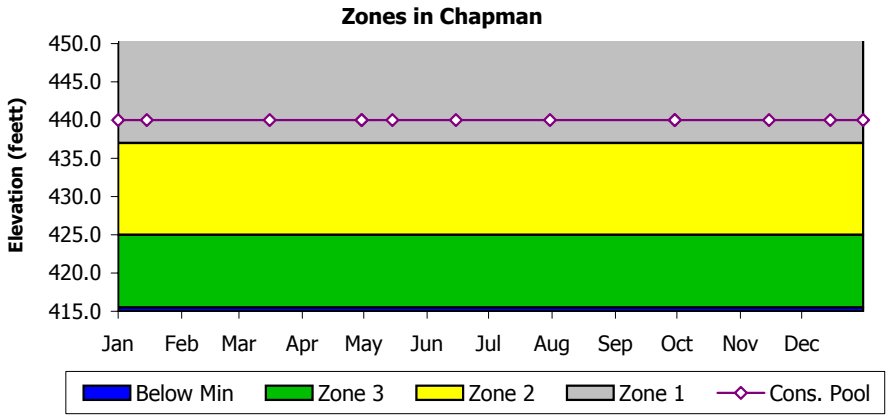


Figure G-10
Yield and Zones for System Run I+50

Pumping Rates (% of Capacity)

Run		Zone in Patman		
I+50		1	2	3
Zone in Chapman	1	0	0	0
	2	100	0	0
	3	100	100	0





Pumping Capacity mgd	Demand Patman ac-ft-year	Demand Chapman ac-ft-year	Additional Yield ac-ft-year	Yield of System ac-ft-year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	99,589	128,600	0	228,189	37,260	110,910
60	99,589	128,600	43,500	271,689	38,077	110,062
120	99,589	128,600	84,500	312,689	37,427	111,213
200	99,589	128,600	107,500	335,689	37,893	111,415
300	99,589	128,600	130,446	358,635	37,403	111,669
400	99,589	128,600	152,756	380,945	37,270	111,921
500	99,589	128,600	161,803	389,992	37,270	111,921
600	99,589	128,600	178,585	406,774	38,185	112,427

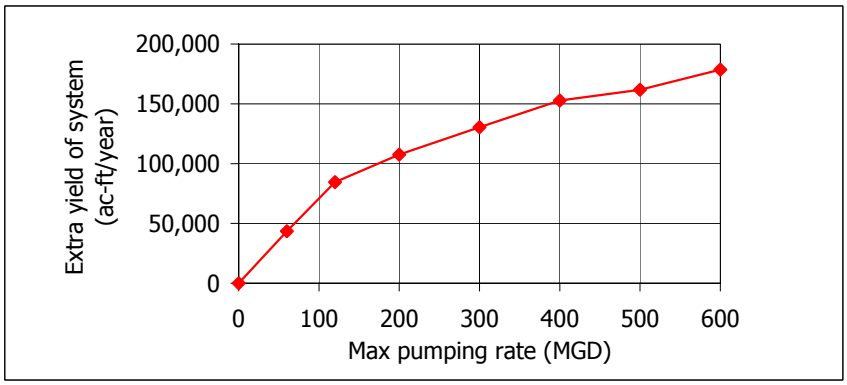
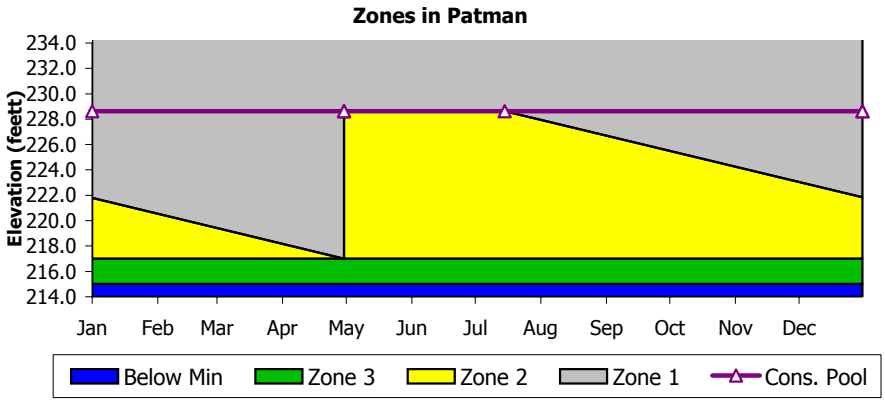


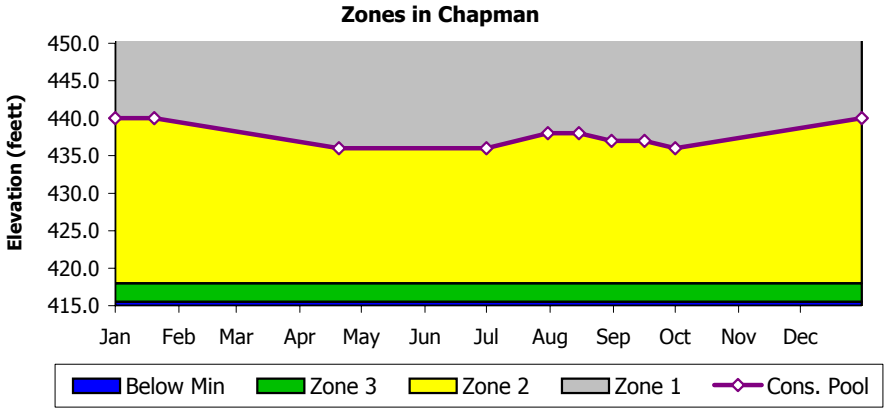
Figure G-11
Yield and Zones for System Run C-2

Run 21

Pumping Rates (% of Capacity)

		Zone in Patman		
		1	2	3
Zone in Chapman	1	0	0	0
	2	100	0	0
	3	100	100	0





Pumping Capacity mgd	Demand Patman ac-ft-year	Demand Chapman ac-ft-year	Additional Yield ac-ft-year	Yield of System ac-ft-year	Min. Cont. Chapman ac-ft	Min. Cont. Patman ac-ft
0	372,540	108,533	0	481,073	37,431	40,787
60	372,540	108,533	29,100	510,173	41,330	40,840
120	367,000	108,533	61,173	536,706	40,786	40,845
200	364,000	108,533	92,000	564,533	40,416	40,972
300	363,700	108,533	117,000	589,233	37,622	40,787

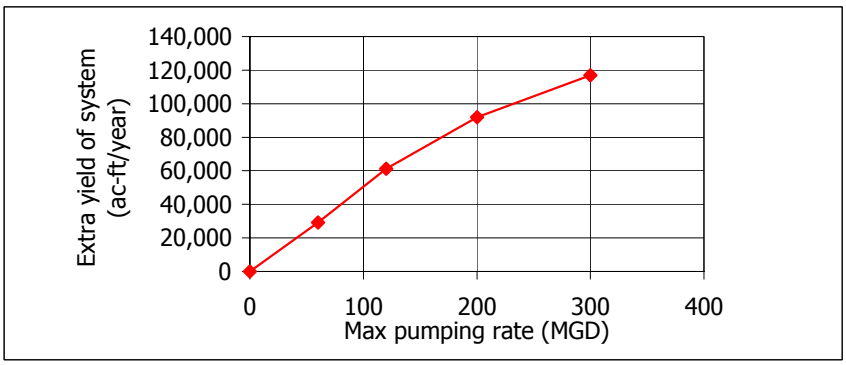
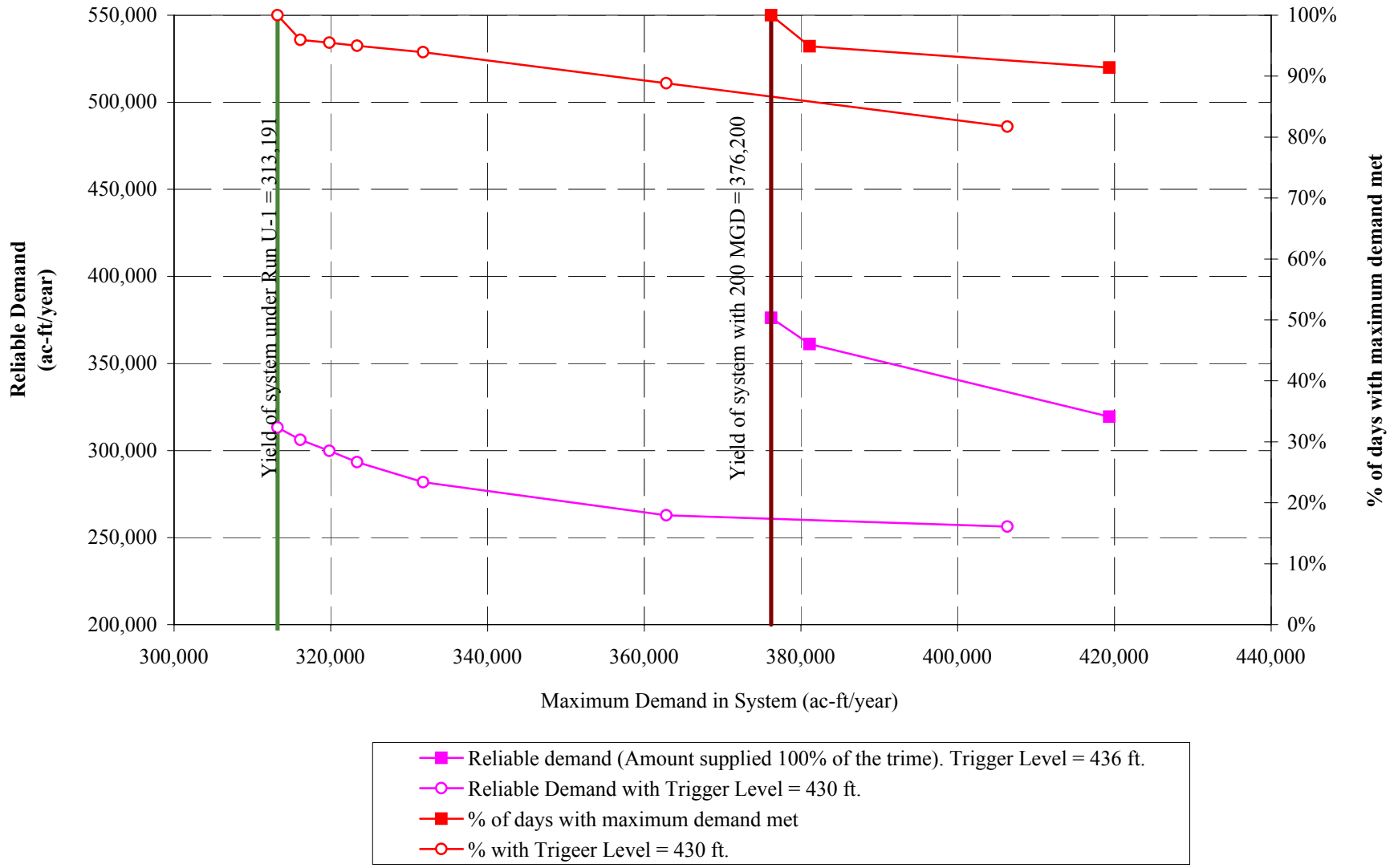


Table G-2
Interruptible Yield Runs

Minimum Chapman	Cons. Pool Chapman	Minimum Patman	Cons. Pool Patman	Trigger Level	Maximum Demand Chapman	% days with max demand supplied	Demand below trigger level	Mean Demand in Chapman	Demand Patman	Maximum Demand System	Reliable Demand System	Mean Demand System	System Operation
415.5	440.0	220.0	Ultimate	430	161,510	100.0%	161,510	161,510	184,591	346,101	346,101	346,101	Pump 200 MGD. Run 11
415.5	440.0	220.0	Ultimate	430	163,989	96.1%	153,989	163,584	184,591	348,580	338,580	348,175	
415.5	440.0	220.0	Ultimate	430	167,447	95.9%	147,447	166,580	184,591	352,038	332,038	351,171	
415.5	440.0	220.0	Ultimate	430	170,085	95.7%	140,085	168,735	184,591	354,676	324,676	353,326	
415.5	440.0	220.0	Ultimate	430	175,050	95.3%	135,050	173,065	184,591	359,641	319,641	357,656	
415.5	440.0	220.0	Ultimate	430	180,001	94.7%	130,001	177,266	184,591	364,592	314,592	361,857	
415.5	440.0	220.0	Ultimate	430	209,672	91.6%	109,672	201,395	184,591	394,263	294,263	385,986	
415.5	440.0	220.0	Ultimate	430	128,600	100.0%	128,600	128,600	184,591	313,191	313,191	313,191	Run U-1
415.5	440.0	220.0	Ultimate	430	131,535	96.0%	121,535	131,122	184,591	316,126	306,126	315,713	
415.5	440.0	220.0	Ultimate	430	135,223	95.5%	115,223	134,303	184,591	319,814	299,814	318,894	
415.5	440.0	220.0	Ultimate	430	138,764	95.0%	108,764	137,237	184,591	323,355	293,355	321,828	
415.5	440.0	220.0	Ultimate	430	147,198	93.9%	97,198	144,170	184,591	331,789	281,789	328,761	
415.5	440.0	220.0	Ultimate	430	178,218	88.8%	78,218	167,238	184,591	362,809	262,809	351,829	
415.5	440.0	220.0	Ultimate	430	221,767	81.7%	71,767	194,681	184,591	406,358	256,358	379,272	
415.5	440.0	220.0	Ultimate	430	193,000	100.0%	193,000	193,000	183,200	376,200	376,200	376,200	Run U-1 200
415.5	440.0	220.0	Ultimate	430	199,100	94.9%	179,100	198,040	182,000	381,100	361,100	380,040	
415.5	440.0	220.0	Ultimate	430	237,350	91.4%	137,350	228,895	182,000	419,350	319,350	410,895	

Figure G-12
Interruptible Demand
Runs U-1 and U-1-200



Appendix H

Elevation-Duration Tables at Highway 67 Bridge

Table H-1
Elevation - Frequency - Duration Tables in Lake Jim Chapman
System Run I-3: Patman Interim Curve and Storage above 215.25 feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 416	1	18	18	18	0.016	62.0	1	18	18	18	0.016	62.0	1	16	16	16	0.016	62.0	2	6	7	5	0.032	31.0	1	14	14	14	0.016	62.0
<= 420	1	146	146	146	0.016	62.0	1	143	143	143	0.016	62.0	1	138	138	138	0.016	62.0	1	113	113	113	0.016	62.0	2	47	88	6	0.032	31.0
<= 424	1	217	217	217	0.016	62.0	1	211	211	211	0.016	62.0	1	197	197	197	0.016	62.0	1	189	189	189	0.016	62.0	1	183	183	183	0.016	62.0
<= 428	4	104	276	2	0.065	15.5	3	148	265	77	0.048	20.7	5	91	258	1	0.081	12.4	4	119	248	20	0.065	15.5	5	104	240	19	0.081	12.4
<= 432	11	141	535	2	0.177	5.6	8	186	509	8	0.129	7.8	9	157	403	2	0.145	6.9	11	122	333	13	0.177	5.6	10	126	300	2	0.161	6.2
<= 436	39	139	656	1	0.629	1.6	39	128	637	1	0.629	1.6	32	143	629	2	0.516	1.9	29	155	619	8	0.468	2.1	32	140	612	3	0.516	1.9
<= 440	162	116	1424	1	2.613	0.4	190	99	1425	1	3.065	0.3	216	87	1063	1	3.484	0.3	761	24	1061	1	12.274	0.1	1412	12	764	1	22.774	0.0
> 440	161	24	93	1	2.597	0.4	189	20	96	1	3.048	0.3	215	18	98	1	3.468	0.3	760	6	83	1	12.258	0.1	1411	4	80	1	22.758	0.0
> 441	66	8	35	1	1.065	0.9	74	8	35	1	1.194	0.8	73	9	34	1	1.177	0.8	71	9	34	1	1.145	0.9	70	10	35	1	1.129	0.9
> 442	29	10	32	1	0.468	2.1	33	9	32	1	0.532	1.9	38	9	25	1	0.613	1.6	41	8	25	1	0.661	1.5	41	9	24	1	0.661	1.5
> 443	17	9	20	2	0.274	3.6	18	9	20	1	0.290	3.4	21	8	20	1	0.339	3.0	20	8	20	1	0.323	3.1	20	8	20	1	0.323	3.1
> 444	11	7	16	3	0.177	5.6	10	7	16	2	0.161	6.2	11	7	17	2	0.177	5.6	10	7	17	2	0.161	6.2	10	7	16	2	0.161	6.2
> 445	3	8	9	8	0.048	20.7	3	8	9	8	0.048	20.7	3	9	9	8	0.048	20.7	4	7	9	1	0.065	15.5	4	7	9	2	0.065	15.5
> 446	3	4	5	3	0.048	20.7	3	4	5	4	0.048	20.7	3	4	5	4	0.048	20.7	3	4	5	4	0.048	20.7	3	4	5	4	0.048	20.7
> 447	1	1	1	1	0.016	62.0	1	1	1	1	0.016	62.0	1	1	1	1	0.016	62.0	1	1	1	1	0.016	62.0	0		0	0	0.000	

Table H-2
Elevation - Frequency - Duration Tables in Lake Wright Patman
System Run I-3: Patman Interim Curve and Storage above 215.25 feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 221	151	53	383	1	2.435	0.4	148	54	384	1	2.387	0.4	151	53	384	1	2.435	0.4	146	55	383	1	2.355	0.4	145	55	384	1	2.339	0.4
<= 220	36	41	185	1	0.581	1.7	33	44	177	1	0.532	1.9	30	48	177	1	0.484	2.1	26	55	177	1	0.419	2.4	28	51	177	1	0.452	2.2
<= 219	13	33	151	1	0.210	4.8	11	39	151	1	0.177	5.6	13	32	151	1	0.210	4.8	10	41	150	1	0.161	6.2	8	51	150	4	0.129	7.8
<= 218	3	71	124	1	0.048	20.7	2	105	124	85	0.032	31.0	2	105	124	85	0.032	31.0	2	105	124	85	0.032	31.0	2	104	123	85	0.032	31.0
<= 217	2	55	60	49	0.032	31.0	2	53	59	47	0.032	31.0	2	53	59	47	0.032	31.0	2	53	59	47	0.032	31.0	2	53	58	47	0.032	31.0
<= 216	1	30	30	30	0.016	62.0	1	30	30	30	0.016	62.0	1	30	30	30	0.016	62.0	1	29	29	29	0.016	62.0	1	29	29	29	0.016	62.0
> 225	121	71	274	1	1.952	0.5	123	70	274	1	1.984	0.5	125	69	274	1	2.016	0.5	122	71	274	1	1.968	0.5	125	70	274	1		
> 230	57	41	210	1	0.919	1.1	57	41	210	3	0.919	1.1	55	43	210	3	0.887	1.1	55	43	210	3	0.887	1.1	55	43	210	3	0.887	1.1
> 235	30	43	196	1	0.484	2.1	31	42	198	3	0.500	2.0	31	43	198	1	0.500	2.0	30	44	197	3	0.484	2.1	30	44	196	3	0.484	2.1
> 240	11	56	167	4	0.177	5.6	11	56	169	4	0.177	5.6	13	48	170	2	0.210	4.8	13	49	170	4	0.210	4.8	13	48	170	4	0.210	4.8
> 242	7	70	150	1	0.113	8.9	7	70	151	1	0.113	8.9	7	70	152	1	0.113	8.9	7	70	151	1	0.113	8.9	7	70	151	1	0.113	8.9
> 245	7	59	140	9	0.113	8.9	7	59	140	10	0.113	8.9	7	59	141	10	0.113	8.9	7	59	140	10	0.113	8.9	7	58	140	9	0.113	8.9
> 250	3	70	119	28	0.048	20.7	3	70	120	28	0.048	20.7	4	53	120	1	0.065	15.5	4	54	120	2	0.065	15.5	4	54	120	3	0.065	15.5
> 255	3	30	52	7	0.048	20.7	3	31	54	8	0.048	20.7	3	32	55	10	0.048	20.7	3	32	55	10	0.048	20.7	3	32	55	10	0.048	20.7
> 260	1	11	11	11	0.016	62.0	1	13	13	13	0.016	62.0	1	15	15	15	0.016	62.0	1	16	16	16	0.016	62.0	1	16	16	16	0.016	62.0

* Ocurrance is a period of consecutive days meeting criteria

Table H-3
Elevation - Frequency - Duration Tables in Lake Jim Chapman
System Run U-1: Patman Ultimate Curve and Storage above 220 feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 416	1	18	18	18	0.016	62.0	1	20	20	20	0.016	62.0	1	16	16	16	0.016	62.0	1	16	16	16	0.016	62.0	1	14	14	14	0.016	62.0
<= 420	1	146	146	146	0.016	62.0	1	172	172	172	0.016	62.0	1	145	145	145	0.016	62.0	1	128	128	128	0.016	62.0	3	53	113	5	0.048	20.7
<= 424	1	217	217	217	0.016	62.0	2	152	237	66	0.032	31.0	2	162	218	105	0.032	31.0	2	161	205	116	0.032	31.0	2	156	194	118	0.032	31.0
<= 428	4	104	276	2	0.065	15.5	7	95	295	7	0.113	8.9	6	112	273	22	0.097	10.3	6	109	258	4	0.097	10.3	5	121	245	4	0.081	12.4
<= 432	11	141	535	2	0.177	5.6	8	222	539	44	0.129	7.8	11	164	511	11	0.177	5.6	12	145	398	2	0.194	5.2	12	134	325	19	0.194	5.2
<= 436	39	139	656	1	0.629	1.6	38	149	655	1	0.613	1.6	34	149	631	2	0.548	1.8	29	160	599	3	0.468	2.1	29	153	590	7	0.468	2.1
<= 440	162	116	1424	1	2.613	0.4	179	107	1427	1	2.887	0.3	211	91	1427	1	3.403	0.3	589	32	1064	1	9.500	0.1	1401	13	730	1	22.597	0.0
> 440	161	24	93	1	2.597	0.4	178	20	96	1	2.871	0.3	210	16	79	1	3.387	0.3	588	6	78	1	9.484	0.1	1401	3	67	1	22.597	0.0
> 441	66	8	35	1	1.065	0.9	67	8	35	1	1.081	0.9	66	9	34	1	1.065	0.9	69	9	34	1	1.113	0.9	70	9	34	1	1.129	0.9
> 442	29	10	32	1	0.468	2.1	30	9	32	1	0.484	2.1	37	8	25	1	0.597	1.7	37	9	25	1	0.597	1.7	38	8	24	1	0.613	1.6
> 443	17	9	20	2	0.274	3.6	17	9	20	1	0.274	3.6	18	8	20	1	0.290	3.4	21	7	21	1	0.339	3.0	21	7	20	1	0.339	3.0
> 444	11	7	16	3	0.177	5.6	11	6	16	1	0.177	5.6	11	6	17	1	0.177	5.6	10	7	17	2	0.161	6.2	10	7	16	2	0.161	6.2
> 445	3	8	9	8	0.048	20.7	3	8	9	7	0.048	20.7	3	9	9	8	0.048	20.7	3	8	10	6	0.048	20.7	4	8	9	6	0.065	15.5
> 446	3	4	5	3	0.048	20.7	3	4	5	3	0.048	20.7	3	4	5	3	0.048	20.7	3	4	5	2	0.048	20.7	3	4	5	2	0.048	20.7
> 447	1	1	1	1	0.016	62.0	0		0	0	0.000		0		0	0	0.000		1	1	1	1	0.016	62.0	1	1	1	1	0.016	62.0

Table H-4
Elevation - Frequency - Duration Tables in Lake Wright Patman
System Run U-1: Patman Ultimate Curve and Storage above 220 feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 226	160	74	576	1	2.581	0.4	159	76	601	1	2.565	0.4	163	76	606	1	2.629	0.4	167	76	606	1	2.694	0.4	168	78	608	1	2.710	0.4
<= 225	153	47	268	1	2.468	0.4	160	47	269	1	2.581	0.4	160	48	269	1	2.581	0.4	159	51	269	1	2.565	0.4	166	50	294	1	2.677	0.4
<= 224	19	70	186	1	0.306	3.3	22	70	181	5	0.355	2.8	23	75	190	9	0.371	2.7	25	77	209	2	0.403	2.5	26	81	212	3	0.419	2.4
<= 223	9	67	153	3	0.145	6.9	8	81	153	12	0.129	7.8	9	79	154	14	0.145	6.9	11	75	162	3	0.177	5.6	15	64	170	1	0.242	4.1
<= 222	5	47	125	1	0.081	12.4	6	62	125	1	0.097	10.3	5	82	126	17	0.081	12.4	5	89	126	16	0.081	12.4	5	89	126	18	0.081	12.4
<= 221	2	45	51	38	0.032	31.0	4	29	51	9	0.065	15.5	4	33	61	6	0.065	15.5	5	34	61	8	0.081	12.4	8	20	63	1	0.129	7.8
> 225	153	101	340	1	2.468	0.4	160	94	340	1	2.581	0.4	160	93	341	1	2.581	0.4	159	92	341	1	2.565	0.4	166	86	341	1	2.677	0.4
> 230	76	39	218	2	1.226	0.8	76	39	217	1	1.226	0.8	73	40	217	2	1.177	0.8	75	39	217	1	1.210	0.8	77	38	215	2	1.242	0.8
> 235	40	40	203	4	0.645	1.6	40	40	202	3	0.645	1.6	41	39	202	2	0.661	1.5	43	38	202	2	0.694	1.4	44	37	201	2	0.710	1.4
> 240	19	40	185	1	0.306	3.3	18	42	184	3	0.290	3.4	20	39	185	1	0.323	3.1	20	40	185	1	0.323	3.1	20	40	184	3	0.323	3.1
> 242	10	58	165	5	0.161	6.2	10	57	164	5	0.161	6.2	10	58	165	7	0.161	6.2	10	58	166	10	0.161	6.2	10	58	166	10	0.161	6.2
> 245	6	75	144	26	0.097	10.3	6	74	144	26	0.097	10.3	6	74	144	26	0.097	10.3	6	74	144	26	0.097	10.3	6	74	144	26	0.097	10.3
> 250	4	63	124	20	0.065	15.5	4	63	123	20	0.065	15.5	4	63	124	21	0.065	15.5	4	63	124	20	0.065	15.5	4	62	124	20	0.065	15.5
> 255	3	37	58	14	0.048	20.7	3	37	58	14	0.048	20.7	3	38	59	15	0.048	20.7	3	38	60	16	0.048	20.7	3	38	59	16	0.048	20.7
> 260	1	21	21	21	0.016	62.0	1	21	21	21	0.016	62.0	1	21	21	21	0.016	62.0	1	23	23	23	0.016	62.0	1	23	23	23	0.016	62.0

* Ocurrance is a period of consecutive days meeting criteria

Table H-5
Elevation - Frequency - Duration Tables in Lake Jim Chapman
System Run U-3: Patman Ultimate Curve and Full Conservation Storage

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 416	1	18	18	18	0.016	62.0	1	19	19	19	0.016	62.0	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	
<= 420	1	146	146	146	0.016	62.0	1	165	165	165	0.016	62.0	1	159	159	159	0.016	62.0	1	133	133	133	0.016	62.0	3	56	132	2	0.048	20.7
<= 424	1	217	217	217	0.016	62.0	2	119	223	14	0.032	31.0	4	96	207	36	0.065	15.5	4	114	194	57	0.065	15.5	6	92	189	12	0.097	10.3
<= 428	4	104	276	2	0.065	15.5	5	121	275	7	0.081	12.4	6	148	263	4	0.097	10.3	8	119	249	4	0.129	7.8	6	173	385	29	0.097	10.3
<= 432	11	141	535	2	0.177	5.6	10	178	564	11	0.161	6.2	14	141	487	3	0.226	4.4	16	130	498	8	0.258	3.9	19	119	506	22	0.306	3.3
<= 436	39	139	656	1	0.629	1.6	49	122	665	1	0.790	1.3	44	140	665	2	0.710	1.4	42	145	661	2	0.677	1.5	45	137	663	1	0.726	1.4
<= 440	162	116	1424	1	2.613	0.4	163	117	1426	1	2.629	0.4	161	121	1427	1	2.597	0.4	166	118	1429	1	2.677	0.4	171	115	1495	1	2.758	0.4
> 440	161	24	93	1	2.597	0.4	162	21	98	1	2.613	0.4	160	20	90	1	2.581	0.4	165	18	64	1	2.661	0.4	170	17	63	1	2.742	0.4
> 441	66	8	35	1	1.065	0.9	61	9	35	1	0.984	1.0	62	8	35	1	1.000	1.0	61	9	35	1	0.984	1.0	63	8	34	1	1.016	1.0
> 442	29	10	32	1	0.468	2.1	27	10	32	1	0.435	2.3	29	9	32	1	0.468	2.1	29	9	22	2	0.468	2.1	30	9	22	1	0.484	2.1
> 443	17	9	20	2	0.274	3.6	17	9	20	1	0.274	3.6	16	9	19	3	0.258	3.9	17	8	18	2	0.274	3.6	16	8	17	2	0.258	3.9
> 444	11	7	16	3	0.177	5.6	10	7	17	3	0.161	6.2	10	7	16	2	0.161	6.2	10	6	14	2	0.161	6.2	10	6	13	1	0.161	6.2
> 445	3	8	9	8	0.048	20.7	3	8	9	7	0.048	20.7	3	7	9	6	0.048	20.7	3	7	9	5	0.048	20.7	3	6	9	3	0.048	20.7
> 446	3	4	5	3	0.048	20.7	3	4	5	3	0.048	20.7	2	3	5	1	0.032	31.0	2	4	6	2	0.032	31.0	2	4	5	2	0.032	31.0
> 447	1	1	1	1	0.016	62.0	0		0	0	0.000		1	2	2	2	0.016	62.0	1	2	2	2	0.016	62.0	0		0	0	0.000	

Table H-6
Elevation - Frequency - Duration Tables in Lake Wright Patman
System Run U-3: Patman Ultimate Curve and Full Conservation Storage

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 221	16	54	168	1	0.258	3.9	15	63	168	1	0.242	4.1	16	63	170	3	0.258	3.9	21	56	175	1	0.339	3.0	22	52	177	1	0.355	2.8
<= 220	8	62	132	2	0.129	7.8	7	80	132	4	0.113	8.9	9	67	141	2	0.145	6.9	7	92	148	5	0.113	8.9	8	80	148	1	0.129	7.8
<= 219	4	82	114	51	0.065	15.5	7	54	114	1	0.113	8.9	5	82	114	69	0.081	12.4	8	57	114	3	0.129	7.8	6	71	110	4	0.097	10.3
<= 218	4	59	97	22	0.065	15.5	5	48	97	1	0.081	12.4	5	54	97	17	0.081	12.4	8	37	96	1	0.129	7.8	5	54	92	19	0.081	12.4
<= 217	7	15	42	1	0.113	8.9	8	12	41	1	0.129	7.8	5	21	41	1	0.081	12.4	6	24	41	5	0.097	10.3	4	23	36	1	0.065	15.5
<= 216	2	10	19	1	0.032	31.0	1	19	19	19	0.016	62.0	2	18	19	16	0.032	31.0	2	18	19	17	0.032	31.0	3	8	16	1	0.048	20.7
> 225	165	82	341	1	2.661	0.4	174	76	341	1	2.806	0.4	172	76	341	1	2.774	0.4	175	75	341	1	2.823	0.4	180	72	341	1	2.903	0.3
> 230	75	38	214	2	1.210	0.8	74	38	213	2	1.194	0.8	75	37	213	2	1.210	0.8	75	37	213	2	1.210	0.8	75	37	213	1	1.210	0.8
> 235	40	39	200	3	0.645	1.6	38	41	199	4	0.613	1.6	39	39	199	4	0.629	1.6	39	39	199	4	0.629	1.6	40	38	199	2	0.645	1.6
> 240	17	43	182	1	0.274	3.6	18	41	181	1	0.290	3.4	18	41	181	3	0.290	3.4	18	41	181	4	0.290	3.4	18	41	181	4	0.290	3.4
> 242	11	50	161	1	0.177	5.6	9	60	159	1	0.145	6.9	8	68	160	11	0.129	7.8	8	68	160	9	0.129	7.8	8	68	161	9	0.129	7.8
> 245	6	73	142	25	0.097	10.3	6	72	141	25	0.097	10.3	6	72	141	25	0.097	10.3	6	72	141	25	0.097	10.3	6	72	141	25	0.097	10.3
> 250	4	61	121	18	0.065	15.5	4	61	121	17	0.065	15.5	4	60	121	17	0.065	15.5	4	61	121	17	0.065	15.5	4	61	121	17	0.065	15.5
> 255	3	36	57	12	0.048	20.7	3	36	57	12	0.048	20.7	3	35	56	10	0.048	20.7	3	35	57	10	0.048	20.7	3	36	57	12	0.048	20.7
> 260	1	20	20	20	0.016	62.0	1	19	19	19	0.016	62.0	1	19	19	19	0.016	62.0	1	19	19	19	0.016	62.0	1	20	20	20	0.016	62.0

* Ocurrance is a period of consecutive days meeting criteria

Table H-7
Elevation - Frequency - Duration Tables in Lake Jim Chapman
System Run F28-2: Lake Patman Flat Conservation at 228.64 and Full Conservation Storage

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 416	1	18	18	18	0.016	62.0	1	17	17	17	0.016	62.0	0		0	0	0.000		3	1	2	1	0.048	20.7	2	9	13	5	0.032	31.0
<= 420	1	146	146	146	0.016	62.0	1	157	157	157	0.016	62.0	3	50	147	1	0.048	20.7	3	69	131	5	0.048	20.7	4	69	111	2	0.065	15.5
<= 424	1	217	217	217	0.016	62.0	3	99	223	17	0.048	20.7	4	131	204	97	0.065	15.5	5	157	193	131	0.081	12.4	6	143	219	62	0.097	10.3
<= 428	4	104	276	2	0.065	15.5	6	118	274	1	0.097	10.3	7	150	258	5	0.113	8.9	9	141	466	2	0.145	6.9	14	115	468	2	0.226	4.4
<= 432	11	141	535	2	0.177	5.6	14	154	578	2	0.226	4.4	18	145	500	6	0.290	3.4	20	162	524	19	0.323	3.1	26	141	534	11	0.419	2.4
<= 436	39	139	656	1	0.629	1.6	50	129	674	1	0.806	1.2	48	143	674	3	0.774	1.3	42	178	677	3	0.677	1.5	49	161	678	1	0.790	1.3
<= 440	162	116	1424	1	2.613	0.4	164	117	1427	1	2.645	0.4	172	114	1428	1	2.774	0.4	168	119	1496	1	2.710	0.4	155	130	1496	1	2.500	0.4
> 440	161	24	93	1	2.597	0.4	163	21	98	1	2.629	0.4	171	18	65	1	2.758	0.4	167	16	61	1	2.694	0.4	154	16	62	1	2.484	0.4
> 441	66	8	35	1	1.065	0.9	60	9	35	1	0.968	1.0	60	9	35	1	0.968	1.0	59	8	34	1	0.952	1.1	57	8	34	1	0.919	1.1
> 442	29	10	32	1	0.468	2.1	28	9	24	2	0.452	2.2	29	9	22	1	0.468	2.1	29	9	20	1	0.468	2.1	28	9	20	1	0.452	2.2
> 443	17	9	20	2	0.274	3.6	17	9	20	1	0.274	3.6	18	8	19	2	0.290	3.4	17	8	17	2	0.274	3.6	18	7	17	1	0.290	3.4
> 444	11	7	16	3	0.177	5.6	10	7	17	3	0.161	6.2	10	7	15	2	0.161	6.2	9	6	13	2	0.145	6.9	9	6	13	2	0.145	6.9
> 445	3	8	9	8	0.048	20.7	3	8	9	7	0.048	20.7	3	8	9	6	0.048	20.7	3	5	8	2	0.048	20.7	2	7	8	5	0.032	31.0
> 446	3	4	5	3	0.048	20.7	3	4	5	3	0.048	20.7	2	4	5	3	0.032	31.0	1	4	4	4	0.016	62.0	1	4	4	4	0.016	62.0
> 447	1	1	1	1	0.016	62.0	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	

Table H-8
Elevation - Frequency - Duration Tables in Lake Wright Patman
System Run F28-2: Lake Patman Flat Conservation at 228.64 and Full Conservation Storage

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 221	14	69	170	1	0.226	4.4	14	73	170	1	0.226	4.4	16	63	171	1	0.258	3.9	22	53	171	1	0.355	2.8	25	58	297	1	0.403	2.5
<= 220	9	68	148	1	0.145	6.9	16	40	148	1	0.258	3.9	12	53	148	1	0.194	5.2	12	60	148	9	0.194	5.2	18	51	148	1	0.290	3.4
<= 219	8	47	124	4	0.129	7.8	10	40	124	2	0.161	6.2	6	71	124	30	0.097	10.3	9	53	125	4	0.145	6.9	14	41	125	2	0.226	4.4
<= 218	4	43	90	2	0.065	15.5	4	50	90	11	0.065	15.5	8	28	91	1	0.129	7.8	9	29	91	1	0.145	6.9	7	50	104	12	0.113	8.9
<= 217	2	35	50	20	0.032	31.0	3	29	50	17	0.048	20.7	3	32	50	20	0.048	20.7	5	22	50	3	0.081	12.4	7	26	50	1	0.113	8.9
<= 216	1	23	23	23	0.016	62.0	1	23	23	23	0.016	62.0	2	16	23	8	0.032	31.0	2	17	23	10	0.032	31.0	4	13	23	7	0.065	15.5
> 225	45	407	2350	2	0.726	1.4	45	401	1678	2	0.726	1.4	54	328	1667	2	0.871	1.1	53	326	1659	2	0.855	1.2	57	299	1659	1	0.919	1.1
> 230	121	32	221	1	1.952	0.5	123	31	220	1	1.984	0.5	123	30	219	1	1.984	0.5	120	30	218	1	1.935	0.5	118	31	217	1	1.903	0.5
> 235	49	41	205	1	0.790	1.3	49	40	204	5	0.790	1.3	50	39	203	5	0.806	1.2	51	38	203	1	0.823	1.2	50	38	202	2	0.806	1.2
> 240	22	42	189	6	0.355	2.8	23	40	187	3	0.371	2.7	23	39	187	3	0.371	2.7	23	39	186	3	0.371	2.7	23	39	186	3	0.371	2.7
> 242	13	52	180	3	0.210	4.8	12	55	179	4	0.194	5.2	12	55	179	4	0.194	5.2	13	50	178	2	0.210	4.8	11	58	178	3	0.177	5.6
> 245	7	67	147	4	0.113	8.9	7	66	145	5	0.113	8.9	7	66	145	5	0.113	8.9	7	65	144	6	0.113	8.9	7	65	144	5	0.113	8.9
> 250	4	66	126	27	0.065	15.5	4	66	125	27	0.065	15.5	4	65	125	27	0.065	15.5	4	64	124	26	0.065	15.5	4	64	124	26	0.065	15.5
> 255	3	41	62	18	0.048	20.7	3	40	62	17	0.048	20.7	3	40	62	17	0.048	20.7	3	40	61	17	0.048	20.7	3	40	61	17	0.048	20.7
> 260	1	27	27	27	0.016	62.0	1	27	27	27	0.016	62.0	1	26	26	26	0.016	62.0	1	26	26	26	0.016	62.0	1	26	26	26	0.016	62.0

* Ocurrance is a period of consecutive days meeting criteria

Table H-9
Elevation - Frequency - Duration Tables in Lake Jim Chapman
System Run F28-1: Lake Patman Flat Conservation at 228.64 and Storage above 220 feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 416	1	18	18	18	0.016	62.0	1	17	17	17	0.016	62.0	1	16	16	16	0.016	62.0	1	15	15	15	0.016	62.0	2	6	7	4	0.032	31.0
<= 420	1	146	146	146	0.016	62.0	1	150	150	150	0.016	62.0	1	148	148	148	0.016	62.0	3	59	136	1	0.048	20.7	3	48	107	10	0.048	20.7
<= 424	1	217	217	217	0.016	62.0	3	81	218	2	0.048	20.7	5	105	206	49	0.081	12.4	6	119	191	11	0.097	10.3	6	125	191	50	0.097	10.3
<= 428	4	104	276	2	0.065	15.5	5	132	269	1	0.081	12.4	6	173	260	7	0.097	10.3	6	199	456	6	0.097	10.3	10	129	452	6	0.161	6.2
<= 432	11	141	535	2	0.177	5.6	12	174	574	25	0.194	5.2	18	151	499	6	0.290	3.4	22	145	520	3	0.355	2.8	24	135	526	1	0.387	2.6
<= 436	39	139	656	1	0.629	1.6	50	129	672	1	0.806	1.2	49	150	676	1	0.790	1.3	47	166	678	1	0.758	1.3	50	155	679	1	0.806	1.2
<= 440	162	116	1424	1	2.613	0.4	154	125	1428	1	2.484	0.4	158	124	1497	1	2.548	0.4	158	126	1499	1	2.548	0.4	164	122	1493	1	2.645	0.4
> 440	161	24	93	1	2.597	0.4	153	22	84	1	2.468	0.4	157	19	64	1	2.532	0.4	157	18	64	1	2.532	0.4	163	16	62	1	2.629	0.4
> 441	66	8	35	1	1.065	0.9	61	9	35	1	0.984	1.0	59	8	35	1	0.952	1.1	59	8	34	1	0.952	1.1	58	8	35	1	0.935	1.1
> 442	29	10	32	1	0.468	2.1	29	9	23	1	0.468	2.1	28	9	22	1	0.452	2.2	29	9	22	1	0.468	2.1	26	10	20	1	0.419	2.4
> 443	17	9	20	2	0.274	3.6	17	9	20	1	0.274	3.6	17	8	18	2	0.274	3.6	16	8	17	3	0.258	3.9	18	8	17	2	0.290	3.4
> 444	11	7	16	3	0.177	5.6	10	7	17	3	0.161	6.2	10	7	14	2	0.161	6.2	10	6	13	1	0.161	6.2	9	6	13	2	0.145	6.9
> 445	3	8	9	8	0.048	20.7	4	7	9	1	0.065	15.5	3	8	9	6	0.048	20.7	3	6	9	3	0.048	20.7	4	5	8	1	0.065	15.5
> 446	3	4	5	3	0.048	20.7	3	4	5	2	0.048	20.7	2	4	5	3	0.032	31.0	2	4	5	2	0.032	31.0	2	4	4	3	0.032	31.0
> 447	1	1	1	1	0.016	62.0	1	2	2	2	0.016	62.0	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	

Table H-10
Elevation - Frequency - Duration Tables in Lake Wright Patman
System Run F28-1: Lake Patman Flat Conservation at 228.64 and Storage above 220 feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 226	46	91	341	1	0.742	1.3	52	85	341	1	0.839	1.2	51	90	341	1	0.823	1.2	60	82	345	1	0.968	1.0	60	86	414	1	0.968	1.0
<= 225	31	89	242	11	0.500	2.0	33	86	243	9	0.532	1.9	37	80	243	2	0.597	1.7	39	82	243	8	0.629	1.6	43	75	295	1	0.694	1.4
<= 224	20	81	196	2	0.323	3.1	21	78	196	2	0.339	3.0	21	79	196	2	0.339	3.0	25	69	196	2	0.403	2.5	30	60	195	1	0.484	2.1
<= 223	14	71	174	1	0.226	4.4	14	71	174	1	0.226	4.4	13	78	174	8	0.210	4.8	13	78	175	8	0.210	4.8	16	64	172	3	0.258	3.9
<= 222	9	47	123	1	0.145	6.9	9	52	123	1	0.145	6.9	8	62	123	3	0.129	7.8	9	57	123	3	0.145	6.9	11	45	103	1	0.177	5.6
<= 221	4	23	60	5	0.065	15.5	4	31	60	15	0.065	15.5	5	28	60	2	0.081	12.4	4	37	60	15	0.065	15.5	4	34	56	9	0.065	15.5
> 225	32	621	2409	5	0.516	1.9	34	582	2407	6	0.548	1.8	38	518	2406	4	0.613	1.6	40	485	2405	1	0.645	1.6	44	441	2389	1	0.710	1.4
> 230	124	32	226	1	2.000	0.5	125	31	224	1	2.016	0.5	124	31	223	1	2.000	0.5	127	30	222	1	2.048	0.5	121	31	222	1	1.952	0.5
> 235	50	41	207	2	0.806	1.2	49	41	206	2	0.790	1.3	50	40	206	1	0.806	1.2	49	40	205	1	0.790	1.3	49	40	205	1	0.790	1.3
> 240	24	40	191	4	0.387	2.6	23	41	190	4	0.371	2.7	23	41	189	2	0.371	2.7	23	41	188	1	0.371	2.7	23	41	189	3	0.371	2.7
> 242	13	53	182	5	0.210	4.8	15	46	182	2	0.242	4.1	14	48	181	1	0.226	4.4	13	51	181	2	0.210	4.8	13	51	181	2	0.210	4.8
> 245	7	69	149	7	0.113	8.9	7	69	149	7	0.113	8.9	7	68	147	7	0.113	8.9	7	67	146	5	0.113	8.9	7	67	148	5	0.113	8.9
> 250	6	47	128	4	0.097	10.3	7	40	127	1	0.113	8.9	5	54	126	3	0.081	12.4	4	67	126	28	0.065	15.5	4	67	126	27	0.065	15.5
> 255	3	44	64	21	0.048	20.7	3	43	63	19	0.048	20.7	3	42	63	18	0.048	20.7	3	42	62	18	0.048	20.7	3	42	63	18	0.048	20.7
> 260	1	28	28	28	0.016	62.0	1	27	27	27	0.016	62.0	1	27	27	27	0.016	62.0	1	27	27	27	0.016	62.0	1	27	27	27	0.016	62.0

* Ocurrance is a period of consecutive days meeting criteria

Table H-11
Elevation - Frequency - Duration Tables in Lake Jim Chapman
Sysem Run I+50: Lake Patman Interim Curve plus 50,000 acre-feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 416	1	18	18	18	0.016	62.0	1	15	15	15	0.016	62.0	1	18	18	18	0.016	62.0	1	12	12	12	0.016	62.0	1	12	12	12	0.016	62.0
<= 420	1	146	146	146	0.016	62.0	1	165	165	165	0.016	62.0	1	184	184	184	0.016	62.0	1	91	91	91	0.016	62.0	3	42	77	2	0.048	20.7
<= 424	1	217	217	217	0.016	62.0	1	231	231	231	0.016	62.0	3	119	245	17	0.048	20.7	2	166	226	106	0.032	31.0	2	170	222	118	0.032	31.0
<= 428	4	104	276	2	0.065	15.5	3	176	283	122	0.048	20.7	7	97	301	3	0.113	8.9	4	153	284	51	0.065	15.5	3	167	268	69	0.048	20.7
<= 432	11	141	535	2	0.177	5.6	10	159	507	5	0.161	6.2	8	220	505	4	0.129	7.8	7	215	401	42	0.113	8.9	12	115	323	4	0.194	5.2
<= 436	39	139	656	1	0.629	1.6	38	136	635	1	0.613	1.6	33	156	636	15	0.532	1.9	26	133	619	2	0.419	2.4	23	138	534	3	0.371	2.7
<= 440	162	116	1424	1	2.613	0.4	186	103	1428	1	3.000	0.3	197	99	1073	1	3.177	0.3	396	49	1063	1	6.387	0.2	1192	15	1062	1	19.226	0.1
> 440	161	24	93	1	2.597	0.4	185	19	92	1	2.984	0.3	196	16	63	1	3.161	0.3	395	9	64	1	6.371	0.2	1191	4	64	1	19.210	0.1
> 441	66	8	35	1	1.065	0.9	67	8	35	1	1.081	0.9	67	8	34	1	1.081	0.9	73	8	33	1	1.177	0.8	73	9	34	1	1.177	0.8
> 442	29	10	32	1	0.468	2.1	30	9	23	1	0.484	2.1	31	9	22	1	0.500	2.0	38	8	22	1	0.613	1.6	41	8	22	1	0.661	1.5
> 443	17	9	20	2	0.274	3.6	17	9	20	1	0.274	3.6	17	8	19	1	0.274	3.6	20	7	19	1	0.323	3.1	23	7	19	2	0.371	2.7
> 444	11	7	16	3	0.177	5.6	11	7	16	3	0.177	5.6	11	6	15	1	0.177	5.6	10	7	16	2	0.161	6.2	10	7	15	2	0.161	6.2
> 445	3	8	9	8	0.048	20.7	3	8	9	7	0.048	20.7	3	7	9	6	0.048	20.7	4	8	9	7	0.065	15.5	4	8	9	8	0.065	15.5
> 446	3	4	5	3	0.048	20.7	3	4	5	3	0.048	20.7	3	3	4	2	0.048	20.7	3	4	6	3	0.048	20.7	4	4	5	3	0.065	15.5
> 447	1	1	1	1	0.016	62.0	0		0	0	0.000		0		0	0	0.000		1	2	2	2	0.016	62.0	1	1	1	1	0.016	62.0

Table H-12
Elevation - Frequency - Duration Tables in Lake Wright Patman
Sysem Run I+50: Lake Patman Interim Curve plus 50,000 acre-feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 226	125	101	623	1	2.016	0.5	125	103	629	1	2.016	0.5	126	105	628	1	2.032	0.5	131	105	630	1	2.113	0.5	128	112	631	3	2.065	0.5
<= 225	140	78	514	1	2.258	0.4	136	81	529	1	2.194	0.5	139	82	530	2	2.242	0.4	138	85	531	1	2.226	0.4	145	84	532	1	2.339	0.4
<= 224	143	65	468	1	2.306	0.4	144	65	492	1	2.323	0.4	142	67	496	1	2.290	0.4	150	65	497	1	2.419	0.4	148	68	498	1	2.387	0.4
<= 223	151	51	380	1	2.435	0.4	151	51	381	1	2.435	0.4	147	53	381	1	2.371	0.4	148	53	381	1	2.387	0.4	148	53	379	1	2.387	0.4
<= 222	5	67	138	9	0.081	12.4	6	61	145	1	0.097	10.3	8	56	147	1	0.129	7.8	9	56	148	2	0.145	6.9	12	45	148	1	0.194	5.2
<= 221	2	58	67	49	0.032	31.0	2	58	66	49	0.032	31.0	3	43	66	15	0.048	20.7	4	48	66	15	0.065	15.5	5	45	66	14	0.081	12.4
> 225	139	84	285	1	2.242	0.4	135	86	285	1	2.177	0.5	138	82	285	1	2.226	0.4	137	80	285	1	2.210	0.5	144	73	285	1	2.323	0.4
> 230	68	40	217	2	1.097	0.9	70	38	216	2	1.129	0.9	69	39	215	1	1.113	0.9	68	39	214	1	1.097	0.9	69	39	213	1	1.113	0.9
> 235	34	44	201	1	0.548	1.8	33	45	201	1	0.532	1.9	33	44	200	5	0.532	1.9	36	41	200	1	0.581	1.7	37	40	198	3	0.597	1.7
> 240	15	48	183	4	0.242	4.1	16	45	183	3	0.258	3.9	16	44	183	3	0.258	3.9	17	43	183	6	0.274	3.6	17	43	182	6	0.274	3.6
> 242	8	66	155	1	0.129	7.8	8	66	160	1	0.129	7.8	7	75	160	13	0.113	8.9	9	59	161	1	0.145	6.9	8	67	160	3	0.129	7.8
> 245	6	73	144	26	0.097	10.3	6	72	143	25	0.097	10.3	6	72	143	25	0.097	10.3	6	72	143	25	0.097	10.3	6	72	142	25	0.097	10.3
> 250	5	48	123	5	0.081	12.4	6	40	123	2	0.097	10.3	6	39	122	2	0.097	10.3	4	58	123	4	0.065	15.5	5	46	122	1	0.081	12.4
> 255	3	35	56	13	0.048	20.7	3	36	57	13	0.048	20.7	3	35	57	13	0.048	20.7	3	36	57	13	0.048	20.7	3	36	57	13	0.048	20.7
> 260	1	17	17	17	0.016	62.0	1	18	18	18	0.016	62.0	1	18	18	18	0.016	62.0	1	20	20	20	0.016	62.0	1	20	20	20	0.016	62.0

* Ocurrance is a period of consecutive days meeting criteria

Table H-13
Elevation - Frequency - Duration Tables in Lake Jim Chapman
System Run C-2: TPWD Wildlife Management Goals

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 416	1	18	18	18	0.016	62.0	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		1	14	14	14	0.016	62.0
<= 420	1	156	156	156	0.016	62.0	1	153	153	153	0.016	62.0	4	53	164	1	0.065	15.5	6	67	142	9	0.097	10.3	7	84	148	7	0.113	8.9
<= 424	1	229	229	229	0.016	62.0	1	211	211	211	0.016	62.0	7	82	211	1	0.113	8.9	7	119	198	9	0.113	8.9	10	103	399	1	0.161	6.2
<= 428	6	63	302	4	0.097	10.3	7	114	275	17	0.113	8.9	11	123	450	4	0.177	5.6	16	125	470	28	0.258	3.9	24	102	492	1	0.387	2.6
<= 432	17	137	593	3	0.274	3.6	20	152	605	15	0.323	3.1	27	150	619	1	0.435	2.3	35	141	538	5	0.565	1.8	40	137	549	1	0.645	1.6
<= 436	63	140	1057	1	1.016	1.0	62	157	1058	2	1.000	1.0	63	169	734	3	1.016	1.0	59	183	731	4	0.952	1.1	84	130	725	1	1.355	0.7
<= 440	76	270	2601	1	1.226	0.8	77	271	2603	1	1.242	0.8	71	298	2605	1	1.145	0.9	98	217	2604	1	1.581	0.6	173	123	2608	1	2.790	0.4
> 440	75	28	93	1	1.210	0.8	76	23	90	1	1.226	0.8	70	21	64	1	1.129	0.9	97	14	63	1	1.565	0.6	172	8	61	1	2.774	0.4
> 441	40	10	34	1	0.645	1.6	38	10	34	1	0.613	1.6	35	9	33	1	0.565	1.8	34	10	32	1	0.548	1.8	35	9	32	1	0.565	1.8
> 442	24	9	21	1	0.387	2.6	21	10	20	1	0.339	3.0	20	9	18	1	0.323	3.1	20	8	18	1	0.323	3.1	19	9	18	2	0.306	3.3
> 443	13	9	16	3	0.210	4.8	14	7	16	1	0.226	4.4	14	7	14	2	0.226	4.4	14	6	12	2	0.226	4.4	13	6	11	2	0.210	4.8
> 444	7	7	12	3	0.113	8.9	8	5	11	1	0.129	7.8	6	5	10	2	0.097	10.3	6	4	9	2	0.097	10.3	5	4	7	2	0.081	12.4
> 445	2	7	7	7	0.032	31.0	2	6	7	4	0.032	31.0	1	6	6	6	0.016	62.0	1	3	3	3	0.016	62.0	1	2	2	2	0.016	62.0
> 446	2	3	3	3	0.032	31.0	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	
> 447	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	

Table H-14
Elevation - Frequency - Duration Tables in Lake Wright Patman
System Run C-2: TPWD Wildlife Management Goals

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 221	19	48	167	1	0.306	3.3	19	50	168	1	0.306	3.3	19	49	169	1	0.306	3.3	21	50	170	1	0.339	3.0	31	41	171	1	0.500	2.0
<= 220	11	54	146	7	0.177	5.6	10	62	146	3	0.161	6.2	12	50	147	1	0.194	5.2	12	54	148	1	0.194	5.2	16	48	149	1	0.258	3.9
<= 219	7	58	121	38	0.113	8.9	8	53	121	1	0.129	7.8	7	60	122	1	0.113	8.9	6	69	124	24	0.097	10.3	10	48	125	4	0.161	6.2
<= 218	5	37	89	11	0.081	12.4	7	33	89	3	0.113	8.9	8	30	89	1	0.129	7.8	7	35	91	4	0.113	8.9	5	60	104	15	0.081	12.4
<= 217	3	21	49	3	0.048	20.7	3	28	49	17	0.048	20.7	3	34	50	19	0.048	20.7	4	26	50	1	0.065	15.5	8	19	50	1	0.129	7.8
<= 216	1	23	23	23	0.016	62.0	1	23	23	23	0.016	62.0	2	18	23	13	0.032	31.0	2	18	23	12	0.032	31.0	2	19	23	15	0.032	31.0
> 225	41	449	2352	1	0.661	1.5	46	392	1676	10	0.742	1.3	50	355	1667	6	0.806	1.2	55	315	1659	2	0.887	1.1	61	278	1042	1	0.984	1.0
> 230	128	30	220	1	2.065	0.5	123	31	220	1	1.984	0.5	123	30	218	1	1.984	0.5	121	31	217	1	1.952	0.5	119	31	217	1	1.919	0.5
> 235	48	41	204	2	0.774	1.3	48	40	204	5	0.774	1.3	49	39	203	5	0.790	1.3	48	40	202	5	0.774	1.3	48	40	201	5	0.774	1.3
> 240	22	42	188	3	0.355	2.8	22	41	188	3	0.355	2.8	23	39	186	3	0.371	2.7	23	39	185	3	0.371	2.7	22	41	186	3	0.355	2.8
> 242	13	51	180	2	0.210	4.8	13	51	179	2	0.210	4.8	12	54	178	4	0.194	5.2	12	53	177	3	0.194	5.2	14	46	177	2	0.226	4.4
> 245	7	66	146	4	0.113	8.9	7	66	145	6	0.113	8.9	7	66	144	7	0.113	8.9	7	65	144	3	0.113	8.9	7	64	144	4	0.113	8.9
> 250	4	66	125	27	0.065	15.5	4	65	125	27	0.065	15.5	4	65	125	27	0.065	15.5	4	64	124	26	0.065	15.5	4	64	124	26	0.065	15.5
> 255	3	40	62	17	0.048	20.7	3	40	61	17	0.048	20.7	3	39	61	16	0.048	20.7	3	39	60	16	0.048	20.7	3	40	61	17	0.048	20.7
> 260	1	26	26	26	0.016	62.0	1	25	25	25	0.016	62.0	1	25	25	25	0.016	62.0	1	24	24	24	0.016	62.0	1	25	25	25	0.016	62.0

* Ocurrance is a period of consecutive days meeting criteria

Table H-15
Water Elevation - Frequency - Duration Tables at Highway 67 during Growing Season (April - October)
System Run I-3: Patman Interim Curve and Full Conservation Storage

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	87	10	130	1	1.403	0.7	87	10	130	1	1.403	0.7	87	10	130	1	1.403	0.7	87	10	130	1	1.403	0.7	83	10	130	1	1.339	0.7
<= 224	190	15	145	1	3.065	0.3	187	15	145	1	3.016	0.3	186	15	145	1	3.000	0.3	189	14	145	1	3.048	0.3	183	15	144	1	2.952	0.3
<= 226	303	22	181	1	4.887	0.2	305	22	181	1	4.919	0.2	306	22	181	1	4.935	0.2	307	22	181	1	4.952	0.2	307	21	181	1	4.952	0.2
<= 228	330	28	181	1	5.323	0.2	327	28	181	1	5.274	0.2	331	28	181	1	5.339	0.2	329	28	181	1	5.306	0.2	327	28	181	1	5.274	0.2
<= 230	255	42	213	1	4.113	0.2	251	42	213	1	4.048	0.2	250	42	213	1	4.032	0.2	249	42	213	1	4.016	0.2	250	42	213	1	4.032	0.2
<= 235	135	88	214	1	2.177	0.5	135	88	214	1	2.177	0.5	134	89	214	1	2.161	0.5	135	88	214	1	2.177	0.5	134	89	214	1	2.161	0.5
<= 240	99	127	214	1	1.597	0.6	100	125	214	1	1.613	0.6	101	124	214	1	1.629	0.6	101	124	214	1	1.629	0.6	100	125	214	1	1.613	0.6
> 230	222	12	185	1	3.581	0.3	218	12	184	1	3.516	0.3	218	12	183	1	3.516	0.3	217	12	183	1	3.500	0.3	218	12	183	1	3.516	0.3
> 235	82	16	167	1	1.323	0.8	82	16	168	1	1.323	0.8	81	16	168	1	1.306	0.8	82	16	167	1	1.323	0.8	81	16	166	1	1.306	0.8
> 240	41	16	154	1	0.661	1.5	42	16	155	1	0.677	1.5	43	16	155	1	0.694	1.4	43	16	154	1	0.694	1.4	42	16	154	1	0.677	1.5
> 242	25	21	148	1	0.403	2.5	26	20	148	1	0.419	2.4	27	19	149	1	0.435	2.3	28	19	148	1	0.452	2.2	28	19	148	1	0.452	2.2
> 245	14	30	138	1	0.226	4.4	14	30	138	1	0.226	4.4	15	28	139	1	0.242	4.1	16	26	138	1	0.258	3.9	16	26	138	1	0.258	3.9
> 250	5	44	118	1	0.081	12.4	5	44	119	1	0.081	12.4	5	44	119	1	0.081	12.4	5	44	119	1	0.081	12.4	5	44	119	1	0.081	12.4
> 255	3	30	53	7	0.048	20.7	3	32	54	9	0.048	20.7	3	32	55	10	0.048	20.7	3	32	55	10	0.048	20.7	3	32	55	10	0.048	20.7
> 260	1	13	13	13	0.016	62.0	1	13	13	13	0.016	62.0	1	16	16	16	0.016	62.0	1	16	16	16	0.016	62.0	1	16	16	16	0.016	62.0

Table H-16
Water Elevation - Frequency - Duration Tables at Highway 67 during Non- Growing Season (November - March)
System Run I-3: Patman Interim Curve and Full Conservation Storage

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	128	10	84	1	2.065	0.5	128	10	84	1	2.065	0.5	130	10	84	1	2.097	0.5	127	10	84	1	2.048	0.5	126	10	84	1	2.032	0.5
<= 224	265	13	95	1	4.274	0.2	260	13	95	1	4.194	0.2	253	14	95	1	4.081	0.2	247	14	95	1	3.984	0.3	241	14	95	1	3.887	0.3
<= 226	319	15	127	1	5.145	0.2	317	15	127	1	5.113	0.2	317	15	127	1	5.113	0.2	311	15	127	1	5.016	0.2	313	15	127	1	5.048	0.2
<= 228	331	17	151	1	5.339	0.2	330	17	151	1	5.323	0.2	331	17	151	1	5.339	0.2	331	17	151	1	5.339	0.2	327	17	151	1	5.274	0.2
<= 230	294	24	151	1	4.742	0.2	293	24	151	1	4.726	0.2	296	23	151	1	4.774	0.2	293	24	151	1	4.726	0.2	293	24	151	1	4.726	0.2
<= 235	147	59	151	1	2.371	0.4	147	59	151	1	2.371	0.4	150	58	151	1	2.419	0.4	152	57	151	1	2.452	0.4	153	57	151	1	2.468	0.4
<= 240	101	90	151	1	1.629	0.6	99	92	151	1	1.597	0.6	99	92	151	1	1.597	0.6	99	92	151	1	1.597	0.6	99	92	151	1	1.597	0.6
> 230	262	9	65	1	4.226	0.2	261	9	66	1	4.210	0.2	265	9	67	1	4.274	0.2	262	9	72	1	4.226	0.2	261	9	72	1	4.210	0.2
> 235	97	7	50	1	1.565	0.6	97	7	50	1	1.565	0.6	100	6	50	1	1.613	0.6	102	6	50	1	1.645	0.6	103	6	50	1	1.661	0.6
> 240	43	5	35	1	0.694	1.4	41	5	35	1	0.661	1.5	41	5	35	1	0.661	1.5	41	5	35	1	0.661	1.5	41	5	35	1	0.661	1.5
> 242	31	3	35	1	0.500	2.0	34	3	35	1	0.548	1.8	34	4	35	1	0.548	1.8	33	4	35	1	0.532	1.9	33	4	35	1	0.532	1.9
> 245	15	3	30	1	0.242	4.1	15	3	30	1	0.242	4.1	15	3	30	1	0.242	4.1	15	3	30	1	0.242	4.1	15	3	30	1	0.242	4.1
> 250	2	2	2	1	0.032	31.0	2	2	2	1	0.032	31.0	2	2	2	1	0.032	31.0	2	2	2	1	0.032	31.0	2	2	2	1	0.032	31.0
> 255	0		0.0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	
> 260	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	

* Ocurrance is a period of consecutive days meeting criteria

Table H-17
Water Elevation - Frequency - Duration Tables at Highway 67 during Growing Season (April - October)
System Run U-1: Patman Ultimate Curve and Storage above 220 feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	4	30	57	2	0.065	15.5	6	22	58	1	0.097	10.3	5	29	58	8	0.081	12.4	6	25	58	1	0.097	10.3	5	29	58	9	0.081	12.4
<= 224	15	35	110	2	0.242	4.1	19	30	110	1	0.306	3.3	23	27	110	1	0.371	2.7	27	27	111	1	0.435	2.3	31	26	111	1	0.500	2.0
<= 226	167	18	181	1	2.694	0.4	178	18	181	1	2.871	0.3	187	19	181	1	3.016	0.3	184	21	181	1	2.968	0.3	188	22	181	1	3.032	0.3
<= 228	292	27	181	1	4.710	0.2	293	27	181	1	4.726	0.2	295	27	181	1	4.758	0.2	293	28	181	1	4.726	0.2	293	28	181	1	4.726	0.2
<= 230	245	43	213	1	3.952	0.3	243	43	213	1	3.919	0.3	245	43	213	1	3.952	0.3	242	43	213	1	3.903	0.3	243	43	213	1	3.919	0.3
<= 235	131	90	214	1	2.113	0.5	133	88	214	1	2.145	0.5	131	90	214	1	2.113	0.5	132	89	214	1	2.129	0.5	132	89	214	1	2.129	0.5
<= 240	100	124	214	1	1.613	0.6	100	124	214	1	1.613	0.6	102	122	214	1	1.645	0.6	101	123	214	1	1.629	0.6	99	125	214	1	1.597	0.6
> 230	216	13	190	1	3.484	0.3	213	13	190	1	3.435	0.3	215	13	189	1	3.468	0.3	212	13	188	1	3.419	0.3	214	13	188	1	3.452	0.3
> 235	78	19	175	1	1.258	0.8	80	18	171	1	1.290	0.8	78	19	171	1	1.258	0.8	79	19	171	1	1.274	0.8	79	19	170	1	1.274	0.8
> 240	42	18	159	1	0.677	1.5	42	18	158	1	0.677	1.5	44	18	158	1	0.710	1.4	44	18	158	1	0.710	1.4	42	19	157	1	0.677	1.5
> 242	30	19	153	1	0.484	2.1	31	18	152	1	0.500	2.0	34	17	152	1	0.548	1.8	32	18	152	1	0.516	1.9	32	18	152	1	0.516	1.9
> 245	15	30	142	1	0.242	4.1	14	32	142	1	0.226	4.4	15	30	142	1	0.242	4.1	17	27	142	1	0.274	3.6	17	27	142	1	0.274	3.6
> 250	5	48	123	1	0.081	12.4	5	48	122	1	0.081	12.4	5	48	123	1	0.081	12.4	5	48	123	1	0.081	12.4	5	47	123	1	0.081	12.4
> 255	3	37	58	14	0.048	20.7	3	37	58	14	0.048	20.7	3	39	59	16	0.048	20.7	3	39	60	16	0.048	20.7	3	38	59	16	0.048	20.7
> 260	1	21	21	21	0.016	62.0	1	21	21	21	0.016	62.0	1	21	21	21	0.016	62.0	1	23	23	23	0.016	62.0	1	23	23	23	0.016	62.0

Table H-18
Water Elevation - Frequency - Duration Tables at Highway 67 during Non- Growing Season (November - March)
System Run U-1: Patman Ultimate Curve and Storage above 220 feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	4	8	14	1	0.065	15.5	10	9	15	1	0.161	6.2	11	9	17	1	0.177	5.6	12	10	17	1	0.194	5.2	12	10	19	1	0.194	5.2
<= 224	24	19	95	1	0.387	2.6	30	17	95	1	0.484	2.1	33	19	95	1	0.532	1.9	34	22	95	1	0.548	1.8	37	22	95	1	0.597	1.7
<= 226	293	14	127	1	4.726	0.2	287	14	127	1	4.629	0.2	283	14	127	1	4.565	0.2	280	14	127	1	4.516	0.2	278	14	127	1	4.484	0.2
<= 228	320	16	151	1	5.161	0.2	320	16	151	1	5.161	0.2	319	16	151	1	5.145	0.2	320	16	151	1	5.161	0.2	314	17	151	1	5.065	0.2
<= 230	274	25	151	1	4.419	0.2	274	25	151	1	4.419	0.2	274	25	151	1	4.419	0.2	275	25	151	1	4.435	0.2	273	25	151	1	4.403	0.2
<= 235	151	56	151	1	2.435	0.4	154	55	151	1	2.484	0.4	152	56	151	1	2.452	0.4	154	55	151	1	2.484	0.4	152	56	151	1	2.452	0.4
<= 240	100	90	151	1	1.613	0.6	100	90	151	1	1.613	0.6	99	91	151	1	1.597	0.6	101	89	151	1	1.629	0.6	101	89	151	1	1.629	0.6
> 230	244	10	98	1	3.935	0.3	244	10	98	1	3.935	0.3	243	10	98	1	3.919	0.3	244	10	98	1	3.935	0.3	244	11	98	1	3.935	0.3
> 235	101	8	56	1	1.629	0.6	104	8	55	1	1.677	0.6	102	8	56	1	1.645	0.6	104	8	56	1	1.677	0.6	102	8	56	1	1.645	0.6
> 240	42	7	42	1	0.677	1.5	42	7	42	1	0.677	1.5	42	7	42	1	0.677	1.5	44	7	42	1	0.710	1.4	44	7	42	1	0.710	1.4
> 242	33	5	35	1	0.532	1.9	33	5	35	1	0.532	1.9	32	6	35	1	0.516	1.9	31	6	35	1	0.500	2.0	31	6	35	1	0.500	2.0
> 245	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1
> 250	3	7	17	1	0.048	20.7	3	6	16	1	0.048	20.7	3	7	17	1	0.048	20.7	3	7	17	1	0.048	20.7	3	7	17	1	0.048	20.7
> 255	0		0.0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	
> 260	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	

* Ocurrance is a period of consecutive days meeting criteria

Table H-19
Water Elevation - Frequency - Duration Tables at Highway 67 during Growing Season (April - October)
System Run U-3: Patman Ultimate Curve and Full Conservation Storage

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	22	19	97	1	0.355	2.8	21	20	96	1	0.339	3.0	18	23	96	2	0.290	3.4	21	21	96	1	0.339	3.0	18	23	94	2	0.290	3.4
<= 224	58	22	132	1	0.935	1.1	61	22	132	1	0.984	1.0	66	21	132	1	1.065	0.9	72	20	132	1	1.161	0.9	73	19	131	1	1.177	0.8
<= 226	196	21	181	1	3.161	0.3	206	21	181	1	3.323	0.3	201	21	181	1	3.242	0.3	215	20	181	1	3.468	0.3	209	21	181	1	3.371	0.3
<= 228	299	27	181	1	4.823	0.2	299	27	181	1	4.823	0.2	297	28	181	1	4.790	0.2	299	28	181	1	4.823	0.2	298	28	181	1	4.806	0.2
<= 230	246	43	213	1	3.968	0.3	249	42	213	1	4.016	0.2	250	42	213	1	4.032	0.2	249	42	213	1	4.016	0.2	248	42	213	1	4.000	0.3
<= 235	133	89	214	1	2.145	0.5	133	89	214	1	2.145	0.5	134	88	214	1	2.161	0.5	133	89	214	1	2.145	0.5	132	89	214	1	2.129	0.5
<= 240	102	122	214	1	1.645	0.6	100	125	214	1	1.613	0.6	101	123	214	1	1.629	0.6	101	123	214	1	1.629	0.6	101	123	214	1	1.629	0.6
> 230	215	13	187	1	3.468	0.3	218	12	187	1	3.516	0.3	219	12	187	1	3.532	0.3	219	12	186	1	3.532	0.3	218	12	186	1	3.516	0.3
> 235	80	18	169	1	1.290	0.8	80	18	168	1	1.290	0.8	81	17	168	1	1.306	0.8	80	18	168	1	1.290	0.8	79	18	168	1	1.274	0.8
> 240	44	17	156	1	0.710	1.4	42	18	155	1	0.677	1.5	43	17	155	1	0.694	1.4	43	17	155	1	0.694	1.4	43	17	155	1	0.694	1.4
> 242	30	19	150	1	0.484	2.1	28	20	149	1	0.452	2.2	29	19	149	1	0.468	2.1	29	19	149	1	0.468	2.1	32	17	149	1	0.516	1.9
> 245	16	28	140	1	0.258	3.9	15	29	139	1	0.242	4.1	15	29	139	1	0.242	4.1	15	29	139	1	0.242	4.1	16	27	139	1	0.258	3.9
> 250	5	47	120	1	0.081	12.4	5	46	120	1	0.081	12.4	5	46	120	1	0.081	12.4	5	46	120	1	0.081	12.4	5	46	120	1	0.081	12.4
> 255	3	36	57	12	0.048	20.7	3	36	57	12	0.048	20.7	3	35	56	11	0.048	20.7	3	35	57	11	0.048	20.7	3	36	57	12	0.048	20.7
> 260	1	20	20	20	0.016	62.0	1	19	19	19	0.016	62.0	1	19	19	19	0.016	62.0	1	19	19	19	0.016	62.0	1	20	20	20	0.016	62.0

Table H-20
Water Elevation - Frequency - Duration Tables at Highway 67 during Non- Growing Season (November - March)
System Run U-3: Patman Ultimate Curve and Full Conservation Storage

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	26	12	39	1	0.419	2.4	28	12	39	1	0.452	2.2	37	11	39	1	0.597	1.7	42	10	39	1	0.677	1.5	39	11	41	1	0.629	1.6
<= 224	64	19	95	1	1.032	1.0	76	18	95	1	1.226	0.8	93	17	95	1	1.500	0.7	106	17	95	1	1.710	0.6	112	17	95	1	1.806	0.6
<= 226	286	14	127	1	4.613	0.2	288	14	127	1	4.645	0.2	285	15	127	1	4.597	0.2	287	15	127	1	4.629	0.2	285	15	127	1	4.597	0.2
<= 228	319	17	151	1	5.145	0.2	320	17	151	1	5.161	0.2	322	17	151	1	5.194	0.2	323	17	151	1	5.210	0.2	325	16	151	1	5.242	0.2
<= 230	275	25	151	1	4.435	0.2	279	24	151	1	4.500	0.2	277	25	151	1	4.468	0.2	279	25	151	1	4.500	0.2	281	24	151	1	4.532	0.2
<= 235	151	56	151	1	2.435	0.4	152	56	151	1	2.452	0.4	151	57	151	1	2.435	0.4	152	56	151	1	2.452	0.4	151	57	151	1	2.435	0.4
<= 240	100	90	151	1	1.613	0.6	99	91	151	1	1.597	0.6	100	91	151	1	1.613	0.6	99	92	151	1	1.597	0.6	99	92	151	1	1.597	0.6
> 230	244	10	98	1	3.935	0.3	248	10	98	1	4.000	0.3	245	10	98	1	3.952	0.3	247	10	98	1	3.984	0.3	248	10	98	1	4.000	0.3
> 235	101	8	56	1	1.629	0.6	102	8	55	1	1.645	0.6	101	8	55	1	1.629	0.6	102	8	56	1	1.645	0.6	101	8	55	1	1.629	0.6
> 240	42	6	42	1	0.677	1.5	41	6	42	1	0.661	1.5	42	6	42	1	0.677	1.5	41	6	42	1	0.661	1.5	41	6	42	1	0.661	1.5
> 242	33	5	35	1	0.532	1.9	34	5	35	1	0.548	1.8	33	5	35	1	0.532	1.9	33	5	35	1	0.532	1.9	33	5	35	1	0.532	1.9
> 245	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1
> 250	3	6	16	1	0.048	20.7	3	6	16	1	0.048	20.7	3	6	16	1	0.048	20.7	3	6	16	1	0.048	20.7	3	6	16	1	0.048	20.7
> 255	0		0.0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	
> 260	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	

* Ocurrance is a period of consecutive days meeting criteria

Table H-21
Water Elevation - Frequency - Duration Tables at Highway 67 during Growing Season (April - October)
System Run F28-2: Lake Patman Flat Conservation at 228.64 and Full Conservation Storage

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	22	11	51	1	0.355	2.8	23	12	54	1	0.371	2.7	23	11	57	1	0.371	2.7	30	11	61	1	0.484	2.1	32	12	65	1	0.516	1.9
<= 224	59	18	82	1	0.952	1.1	65	17	84	1	1.048	1.0	66	18	87	1	1.065	0.9	72	18	90	1	1.161	0.9	77	18	95	1	1.242	0.8
<= 226	91	31	115	1	1.468	0.7	98	30	117	1	1.581	0.6	108	28	120	1	1.742	0.6	111	29	123	1	1.790	0.6	115	29	128	1	1.855	0.5
<= 228	167	35	181	1	2.694	0.4	169	36	180	1	2.726	0.4	171	35	179	1	2.758	0.4	180	34	181	1	2.903	0.3	176	35	181	1	2.839	0.4
<= 230	232	44	213	1	3.742	0.3	235	44	213	1	3.790	0.3	238	43	213	1	3.839	0.3	236	44	213	1	3.806	0.3	240	43	213	1	3.871	0.3
<= 235	127	92	214	1	2.048	0.5	126	93	214	1	2.032	0.5	128	91	214	1	2.065	0.5	128	91	214	1	2.065	0.5	129	91	214	1	2.081	0.5
<= 240	100	124	214	1	1.613	0.6	98	126	214	1	1.581	0.6	98	126	214	1	1.581	0.6	98	126	214	1	1.581	0.6	98	126	214	1	1.581	0.6
> 230	209	14	190	1	3.371	0.3	212	14	189	1	3.419	0.3	215	13	188	1	3.468	0.3	212	13	187	1	3.419	0.3	216	13	186	1	3.484	0.3
> 235	77	20	176	1	1.242	0.8	76	20	176	1	1.226	0.8	78	20	173	1	1.258	0.8	77	20	172	1	1.242	0.8	78	19	170	1	1.258	0.8
> 240	43	20	160	1	0.694	1.4	41	20	159	1	0.661	1.5	41	20	159	1	0.661	1.5	41	20	158	1	0.661	1.5	41	20	158	1	0.661	1.5
> 242	36	18	154	1	0.581	1.7	33	19	153	1	0.532	1.9	33	19	153	1	0.532	1.9	32	20	152	1	0.516	1.9	32	20	152	1	0.516	1.9
> 245	16	29	144	1	0.258	3.9	16	29	143	1	0.258	3.9	17	27	143	1	0.274	3.6	16	29	142	1	0.258	3.9	16	29	142	1	0.258	3.9
> 250	7	36	125	1	0.113	8.9	6	41	124	1	0.097	10.3	5	49	124	1	0.081	12.4	5	48	123	1	0.081	12.4	5	48	123	1	0.081	12.4
> 255	3	41	62	19	0.048	20.7	3	40	62	17	0.048	20.7	3	40	62	17	0.048	20.7	3	40	61	17	0.048	20.7	3	40	61	17	0.048	20.7
> 260	1	27	27	27	0.016	62.0	1	27	27	27	0.016	62.0	1	26	26	26	0.016	62.0	1	26	26	26	0.016	62.0	1	26	26	26	0.016	62.0

Table H-22
Water Elevation - Frequency - Duration Tables at Highway 67 during Non- Growing Season (November - March)
System Run F28-2: Lake Patman Flat Conservation at 228.64 and Full Conservation Storage

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	36	13	43	1	0.581	1.7	37	13	43	1	0.597	1.7	40	12	43	1	0.645	1.6	43	11	43	1	0.694	1.4	48	11	43	1	0.774	1.3
<= 224	65	18	95	1	1.048	1.0	73	17	95	1	1.177	0.8	80	18	95	1	1.290	0.8	91	17	95	1	1.468	0.7	99	17	95	1	1.597	0.6
<= 226	92	21	127	1	1.484	0.7	101	21	127	1	1.629	0.6	105	21	127	1	1.694	0.6	109	22	127	1	1.758	0.6	118	21	127	1	1.903	0.5
<= 228	125	24	151	1	2.016	0.5	129	24	151	1	2.081	0.5	137	23	151	1	2.210	0.5	142	23	151	1	2.290	0.4	150	22	151	1	2.419	0.4
<= 230	250	26	151	1	4.032	0.2	254	25	151	1	4.097	0.2	256	25	151	1	4.129	0.2	261	25	151	1	4.210	0.2	261	25	151	1	4.210	0.2
<= 235	152	54	151	1	2.452	0.4	150	55	151	1	2.419	0.4	149	56	151	1	2.403	0.4	151	55	151	1	2.435	0.4	150	55	151	1	2.419	0.4
<= 240	107	84	151	1	1.726	0.6	107	84	151	1	1.726	0.6	106	85	151	1	1.710	0.6	105	85	151	1	1.694	0.6	105	85	151	1	1.694	0.6
> 230	226	13	98	1	3.645	0.3	230	12	98	1	3.710	0.3	231	12	98	1	3.726	0.3	235	12	98	1	3.790	0.3	234	12	98	1	3.774	0.3
> 235	104	10	60	1	1.677	0.6	102	10	60	1	1.645	0.6	101	10	60	1	1.629	0.6	103	10	60	1	1.661	0.6	102	10	60	1	1.645	0.6
> 240	51	7	42	1	0.823	1.2	51	7	42	1	0.823	1.2	50	7	42	1	0.806	1.2	49	7	42	1	0.790	1.3	49	7	42	1	0.790	1.3
> 242	33	7	35	1	0.532	1.9	33	7	35	1	0.532	1.9	33	7	35	1	0.532	1.9	32	7	35	1	0.516	1.9	34	6	35	1	0.548	1.8
> 245	20	4	32	1	0.323	3.1	19	4	32	1	0.306	3.3	18	4	32	1	0.290	3.4	18	4	31	1	0.290	3.4	19	4	31	1	0.306	3.3
> 250	3	7	19	1	0.048	20.7	3	7	19	1	0.048	20.7	3	7	19	1	0.048	20.7	3	7	19	1	0.048	20.7	3	7	18	1	0.048	20.7
> 255	0		0.0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	
> 260	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	

* Ocurrance is a period of consecutive days meeting criteria

Table H-23
Water Elevation - Frequency - Duration Tables at Highway 67 during Growing Season (April - October)
System Run F28-1: Lake Patman Flat Conservation at 228.64 and Storage above 220 feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	2	14	18	10	0.032	31.0	2	16	21	10	0.032	31.0	2	18	25	10	0.032	31.0	4	13	30	1	0.065	15.5	6	10	35	1	0.097	10.3
<= 224	21	21	60	1	0.339	3.0	21	21	64	1	0.339	3.0	20	23	66	2	0.323	3.1	22	21	70	1	0.355	2.8	25	20	75	2	0.403	2.5
<= 226	70	27	100	1	1.129	0.9	73	27	103	1	1.177	0.8	73	27	105	1	1.177	0.8	79	26	109	1	1.274	0.8	89	24	114	1	1.435	0.7
<= 228	139	39	174	1	2.242	0.4	146	38	172	1	2.355	0.4	154	36	174	1	2.484	0.4	168	34	174	1	2.710	0.4	168	34	175	1	2.710	0.4
<= 230	230	45	213	1	3.710	0.3	230	45	213	1	3.710	0.3	232	44	213	1	3.742	0.3	234	44	213	1	3.774	0.3	231	45	213	1	3.726	0.3
<= 235	127	92	214	1	2.048	0.5	127	92	214	1	2.048	0.5	126	93	214	1	2.032	0.5	128	91	214	1	2.065	0.5	127	92	214	1	2.048	0.5
<= 240	99	125	214	1	1.597	0.6	97	127	214	1	1.565	0.6	97	127	214	1	1.565	0.6	98	126	214	1	1.581	0.6	99	125	214	1	1.597	0.6
> 230	207	14	194	1	3.339	0.3	207	14	194	1	3.339	0.3	209	14	193	1	3.371	0.3	211	14	192	1	3.403	0.3	208	14	192	1	3.355	0.3
> 235	77	20	179	1	1.242	0.8	77	20	180	1	1.242	0.8	76	20	178	1	1.226	0.8	78	20	178	1	1.258	0.8	77	20	178	1	1.242	0.8
> 240	42	21	162	1	0.677	1.5	40	22	162	1	0.645	1.6	40	21	161	1	0.645	1.6	41	21	160	1	0.661	1.5	42	20	161	1	0.677	1.5
> 242	36	19	156	1	0.581	1.7	36	19	156	1	0.581	1.7	33	20	155	1	0.532	1.9	35	19	155	1	0.565	1.8	35	19	155	1	0.565	1.8
> 245	16	30	146	1	0.258	3.9	15	32	146	1	0.242	4.1	15	32	145	1	0.242	4.1	15	31	144	1	0.242	4.1	15	32	145	1	0.242	4.1
> 250	7	39	127	1	0.113	8.9	8	34	126	1	0.129	7.8	7	38	125	1	0.113	8.9	8	33	125	1	0.129	7.8	7	37	125	1	0.113	8.9
> 255	3	44	64	21	0.048	20.7	3	43	63	20	0.048	20.7	3	42	63	19	0.048	20.7	3	42	62	19	0.048	20.7	3	43	63	19	0.048	20.7
> 260	1	28	28	28	0.016	62.0	1	27	27	27	0.016	62.0	1	27	27	27	0.016	62.0	1	27	27	27	0.016	62.0	1	27	27	27	0.016	62.0

Table H-24
Water Elevation - Frequency - Duration Tables at Highway 67 during Non- Growing Season (November - March)
System Run F28-1: Lake Patman Flat Conservation at 228.64 and Storage above 220 feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	13	11	22	1	0.210	4.8	15	11	22	1	0.242	4.1	15	11	22	1	0.242	4.1	16	10	22	1	0.258	3.9	16	10	20	1	0.258	3.9
<= 224	33	24	95	1	0.532	1.9	34	24	95	1	0.548	1.8	35	23	95	1	0.565	1.8	36	23	95	1	0.581	1.7	37	22	95	1	0.597	1.7
<= 226	70	21	127	1	1.129	0.9	76	21	127	1	1.226	0.8	83	21	127	1	1.339	0.7	89	21	127	1	1.435	0.7	94	21	127	1	1.516	0.7
<= 228	103	25	151	1	1.661	0.6	111	24	151	1	1.790	0.6	120	23	151	1	1.935	0.5	123	24	151	1	1.984	0.5	127	24	151	1	2.048	0.5
<= 230	248	26	151	1	4.000	0.3	250	26	151	1	4.032	0.2	252	26	151	1	4.065	0.2	256	25	151	1	4.129	0.2	258	25	151	1	4.161	0.2
<= 235	153	54	151	1	2.468	0.4	151	55	151	1	2.435	0.4	150	55	151	1	2.419	0.4	150	55	151	1	2.419	0.4	151	55	151	1	2.435	0.4
<= 240	107	83	151	1	1.726	0.6	108	83	151	1	1.742	0.6	107	84	151	1	1.726	0.6	106	85	151	1	1.710	0.6	106	85	151	1	1.710	0.6
> 230	224	13	98	1	3.613	0.3	226	13	98	1	3.645	0.3	227	13	98	1	3.661	0.3	231	12	98	1	3.726	0.3	233	12	98	1	3.758	0.3
> 235	105	10	61	1	1.694	0.6	103	10	62	1	1.661	0.6	102	10	61	1	1.645	0.6	102	10	61	1	1.645	0.6	103	10	61	1	1.661	0.6
> 240	51	8	42	1	0.823	1.2	52	7	42	1	0.839	1.2	51	7	42	1	0.823	1.2	50	7	42	1	0.806	1.2	50	7	42	1	0.806	1.2
> 242	33	7	36	1	0.532	1.9	33	7	36	1	0.532	1.9	35	6	36	1	0.565	1.8	35	6	36	1	0.565	1.8	34	6	35	1	0.548	1.8
> 245	20	4	32	1	0.323	3.1	19	4	32	1	0.306	3.3	19	4	32	1	0.306	3.3	19	4	32	1	0.306	3.3	18	4	32	1	0.290	3.4
> 250	3	8	20	1	0.048	20.7	3	8	20	1	0.048	20.7	3	8	20	1	0.048	20.7	3	8	20	1	0.048	20.7	3	7	19	1	0.048	20.7
> 255	0		0.0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	
> 260	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	

* Ocurrance is a period of consecutive days meeting criteria

Table H-25
Water Elevation - Frequency - Duration Tables at Highway 67 during Growing Season (April - October)
Sysem Run I+50: Lake Patman Interim Curve plus 50,000 acre-feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	5	35	80	2	0.081	12.4	5	35	80	2	0.081	12.4	5	35	80	2	0.081	12.4	6	33	80	2	0.097	10.3	6	34	79	2	0.097	10.3
<= 224	114	11	136	1	1.839	0.5	116	11	136	1	1.871	0.5	116	12	136	1	1.871	0.5	118	13	136	1	1.903	0.5	120	14	136	1	1.935	0.5
<= 226	187	18	181	1	3.016	0.3	193	19	181	1	3.113	0.3	195	21	181	1	3.145	0.3	208	21	181	1	3.355	0.3	226	22	181	1	3.645	0.3
<= 228	294	27	181	1	4.742	0.2	301	27	181	1	4.855	0.2	303	27	181	1	4.887	0.2	308	27	181	1	4.968	0.2	301	28	181	1	4.855	0.2
<= 230	249	42	213	1	4.016	0.2	250	42	213	1	4.032	0.2	246	43	213	1	3.968	0.3	245	43	213	1	3.952	0.3	244	43	213	1	3.935	0.3
<= 235	134	88	214	1	2.161	0.5	134	88	214	1	2.161	0.5	131	90	214	1	2.113	0.5	129	91	214	1	2.081	0.5	131	90	214	1	2.113	0.5
<= 240	100	125	214	1	1.613	0.6	100	125	214	1	1.613	0.6	100	125	214	1	1.613	0.6	100	125	214	1	1.613	0.6	100	125	214	1	1.613	0.6
> 230	217	13	190	1	3.500	0.3	218	12	189	1	3.516	0.3	214	13	187	1	3.452	0.3	215	13	186	1	3.468	0.3	214	13	186	1	3.452	0.3
> 235	81	18	171	1	1.306	0.8	81	18	171	1	1.306	0.8	78	18	170	1	1.258	0.8	76	19	170	1	1.226	0.8	78	18	168	1	1.258	0.8
> 240	42	18	158	1	0.677	1.5	42	18	158	1	0.677	1.5	42	17	157	1	0.677	1.5	42	18	157	1	0.677	1.5	42	18	156	1	0.677	1.5
> 242	28	20	152	1	0.452	2.2	29	19	152	1	0.468	2.1	28	20	151	1	0.452	2.2	31	18	151	1	0.500	2.0	31	18	150	1	0.500	2.0
> 245	16	28	142	1	0.258	3.9	16	28	141	1	0.258	3.9	16	27	141	1	0.258	3.9	15	29	141	1	0.242	4.1	16	27	140	1	0.258	3.9
> 250	5	46	122	1	0.081	12.4	4	58	122	1	0.065	15.5	4	57	121	1	0.065	15.5	4	58	122	1	0.065	15.5	4	58	121	1	0.065	15.5
> 255	3	35	56	13	0.048	20.7	3	36	57	13	0.048	20.7	3	35	57	13	0.048	20.7	3	36	57	13	0.048	20.7	3	36	57	13	0.048	20.7
> 260	1	17	17	17	0.016	62.0	1	18	18	18	0.016	62.0	1	19	19	19	0.016	62.0	1	20	20	20	0.016	62.0	1	20	20	20	0.016	62.0

Table H-26
Water Elevation - Frequency - Duration Tables at Highway 67 during Non- Growing Season (November - March)
Sysem Run I+50: Lake Patman Interim Curve plus 50,000 acre-feet

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	2	19	24	14	0.032	31.0	2	19	24	14	0.032	31.0	10	9	24	1	0.161	6.2	10	10	24	1	0.161	6.2	10	10	24	1	0.161	6.2
<= 224	264	13	95	1	4.258	0.2	261	13	95	1	4.210	0.2	260	13	95	1	4.194	0.2	248	14	95	1	4.000	0.3	239	14	95	1	3.855	0.3
<= 226	313	15	127	1	5.048	0.2	314	15	127	1	5.065	0.2	314	15	127	1	5.065	0.2	310	15	127	1	5.000	0.2	306	15	127	1	4.935	0.2
<= 228	321	17	151	1	5.177	0.2	324	17	151	1	5.226	0.2	325	17	151	1	5.242	0.2	325	17	151	1	5.242	0.2	321	17	151	1	5.177	0.2
<= 230	280	25	151	1	4.516	0.2	283	24	151	1	4.565	0.2	283	24	151	1	4.565	0.2	285	24	151	1	4.597	0.2	281	24	151	1	4.532	0.2
<= 235	153	56	151	1	2.468	0.4	150	57	151	1	2.419	0.4	151	57	151	1	2.435	0.4	154	56	151	1	2.484	0.4	155	55	151	1	2.500	0.4
<= 240	98	93	151	1	1.581	0.6	98	93	151	1	1.581	0.6	98	93	151	1	1.581	0.6	99	92	151	1	1.597	0.6	99	92	151	1	1.597	0.6
> 230	248	10	98	1	4.000	0.3	250	10	72	1	4.032	0.2	251	10	98	1	4.048	0.2	253	10	75	1	4.081	0.2	249	10	75	1	4.016	0.2
> 235	103	7	53	1	1.661	0.6	100	7	53	1	1.613	0.6	101	7	52	1	1.629	0.6	104	7	54	1	1.677	0.6	105	7	56	1	1.694	0.6
> 240	40	6	35	1	0.645	1.6	40	6	35	1	0.645	1.6	40	6	35	1	0.645	1.6	41	6	35	1	0.661	1.5	42	6	35	1	0.677	1.5
> 242	33	4	35	1	0.532	1.9	33	4	35	1	0.532	1.9	33	4	35	1	0.532	1.9	33	5	35	1	0.532	1.9	33	5	35	1	0.532	1.9
> 245	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1	15	4	31	1	0.242	4.1
> 250	3	6	15	1	0.048	20.7	3	6	15	1	0.048	20.7	4	4	10	1	0.065	15.5	4	3	8	1	0.065	15.5	3	4	8	1	0.048	20.7
> 255	0		0.0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	
> 260	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	

* Ocurrance is a period of consecutive days meeting criteria

Table H-27
Water Elevation - Frequency - Duration Tables at Highway 67 during Growing Season (April - October)
System Run C-2: TPWD Wildlife Management Goals

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	22	11	53	1	0.355	2.8	22	11	56	1	0.355	2.8	21	12	58	1	0.339	3.0	25	12	61	1	0.403	2.5	30	12	65	1	0.484	2.1
<= 224	56	17	83	1	0.903	1.1	60	18	86	1	0.968	1.0	63	17	87	1	1.016	1.0	72	17	90	1	1.161	0.9	77	17	95	1	1.242	0.8
<= 226	89	30	116	1	1.435	0.7	96	30	118	1	1.548	0.6	111	28	120	1	1.790	0.6	115	28	123	1	1.855	0.5	117	28	128	1	1.887	0.5
<= 228	160	36	178	1	2.581	0.4	167	35	178	1	2.694	0.4	169	36	173	1	2.726	0.4	180	34	179	1	2.903	0.3	172	36	175	1	2.774	0.4
<= 230	231	44	213	1	3.726	0.3	233	44	213	1	3.758	0.3	235	44	213	1	3.790	0.3	233	44	213	1	3.758	0.3	234	44	213	1	3.774	0.3
<= 235	127	92	214	1	2.048	0.5	127	92	214	1	2.048	0.5	129	91	214	1	2.081	0.5	127	92	214	1	2.048	0.5	126	93	214	1	2.032	0.5
<= 240	102	121	214	1	1.645	0.6	99	125	214	1	1.597	0.6	100	124	214	1	1.613	0.6	100	124	214	1	1.613	0.6	100	124	214	1	1.613	0.6
> 230	208	14	191	1	3.355	0.3	209	14	191	1	3.371	0.3	211	14	189	1	3.403	0.3	208	14	188	1	3.355	0.3	209	14	188	1	3.371	0.3
> 235	77	20	178	1	1.242	0.8	76	20	178	1	1.226	0.8	78	20	173	1	1.258	0.8	76	20	172	1	1.226	0.8	75	20	169	1	1.210	0.8
> 240	45	19	159	1	0.726	1.4	42	20	159	1	0.677	1.5	43	19	158	1	0.694	1.4	43	19	157	1	0.694	1.4	43	19	157	1	0.694	1.4
> 242	36	18	154	1	0.581	1.7	34	19	153	1	0.548	1.8	34	19	152	1	0.548	1.8	34	19	151	1	0.548	1.8	33	19	151	1	0.532	1.9
> 245	17	28	144	1	0.274	3.6	16	29	143	1	0.258	3.9	17	27	142	1	0.274	3.6	17	27	142	1	0.274	3.6	17	27	142	1	0.274	3.6
> 250	7	36	124	1	0.113	8.9	6	41	124	1	0.097	10.3	5	49	124	1	0.081	12.4	6	40	123	1	0.097	10.3	5	48	123	1	0.081	12.4
> 255	3	40	62	17	0.048	20.7	3	40	61	17	0.048	20.7	3	39	61	16	0.048	20.7	3	39	60	16	0.048	20.7	3	40	61	17	0.048	20.7
> 260	1	26	26	26	0.016	62.0	1	25	25	25	0.016	62.0	1	25	25	25	0.016	62.0	1	24	24	24	0.016	62.0	1	25	25	25	0.016	62.0

Table H-28
Water Elevation - Frequency - Duration Tables at Highway 67 during Non- Growing Season (November - March)
System Run C-2: TPWD Wildlife Management Goals

Criteria	No Pumping						60 MGD						120 MGD						200 MGD						300 MGD					
	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)	Number of Ocurrances in Simluation Period (*)	Average Number of Days of Ocurrance	Maximum Number of Days	Minimum Number of Days	Average Number of Times per Year	Return Period (Years)
<= 222	35	12	43	1	0.565	1.8	37	12	43	1	0.597	1.7	39	12	43	1	0.629	1.6	43	11	42	1	0.694	1.4	46	11	43	1	0.742	1.3
<= 224	65	18	95	1	1.048	1.0	78	17	95	1	1.258	0.8	81	18	95	1	1.306	0.8	92	17	95	1	1.484	0.7	102	17	95	1	1.645	0.6
<= 226	86	23	127	1	1.387	0.7	102	21	127	1	1.645	0.6	104	21	127	1	1.677	0.6	114	21	127	1	1.839	0.5	124	21	127	1	2.000	0.5
<= 228	122	25	151	1	1.968	0.5	130	24	151	1	2.097	0.5	141	23	151	1	2.274	0.4	152	22	151	1	2.452	0.4	154	23	151	1	2.484	0.4
<= 230	254	25	151	1	4.097	0.2	254	25	151	1	4.097	0.2	255	25	151	1	4.113	0.2	258	25	151	1	4.161	0.2	264	25	151	1	4.258	0.2
<= 235	155	53	151	1	2.500	0.4	153	54	151	1	2.468	0.4	151	55	151	1	2.435	0.4	152	55	151	1	2.452	0.4	154	54	151	2	2.484	0.4
<= 240	107	84	151	2	1.726	0.6	105	85	151	2	1.694	0.6	104	86	151	2	1.677	0.6	104	86	151	2	1.677	0.6	105	85	151	2	1.694	0.6
> 230	230	12	98	1	3.710	0.3	230	12	98	1	3.710	0.3	231	12	98	1	3.726	0.3	233	12	98	1	3.758	0.3	238	12	98	1	3.839	0.3
> 235	107	10	61	1	1.726	0.6	105	10	61	1	1.694	0.6	103	10	60	1	1.661	0.6	103	10	59	1	1.661	0.6	106	9	60	1	1.710	0.6
> 240	52	7	42	1	0.839	1.2	50	7	42	1	0.806	1.2	49	7	42	1	0.790	1.3	49	7	42	1	0.790	1.3	50	7	42	1	0.806	1.2
> 242	34	7	36	1	0.548	1.8	33	7	35	1	0.532	1.9	34	6	35	1	0.548	1.8	33	6	35	1	0.532	1.9	33	7	35	1	0.532	1.9
> 245	20	4	32	1	0.323	3.1	20	4	32	1	0.323	3.1	19	4	32	1	0.306	3.3	19	4	32	1	0.306	3.3	20	4	32	1	0.323	3.1
> 250	3	7	19	1	0.048	20.7	3	7	19	1	0.048	20.7	3	7	19	1	0.048	20.7	3	7	19	1	0.048	20.7	3	7	19	1	0.048	20.7
> 255	0		0.0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	
> 260	0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000		0		0	0	0.000	

* Ocurrance is a period of consecutive days meeting criteria

Appendix I

Cost Estimates

Pipeline from Wright Patman to Lake Chapman
30 MGD

Construction Costs

Transmission Facilities

Pipeline Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pipeline	48"	426,149	L.F.	$150	$63,922,000
Right of Way Easement	200 ft.	1,957	Acre	$5,000	$9,783,000
Outlet Structure		1	L.S.	$100,000	$100,000
					$73,805,000
Engineering and Contingencies (30%)					$22,142,000
Subtotal for Pipeline					**$95,947,000**

Pump Station Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pump Station at Wright Patman		1	L.S.	$7,500,000	$7,500,000
Intake Facilities at Wright Patman		1	L.S.	$4,000,000	$4,000,000
Booster Pump Station		1	L.S.	$4,500,000	$4,500,000
Storage Tank(s) at Pump Station	3 MG	1	L.S.	$500,000	$500,000
					$16,500,000
Engineering and Contingencies (30%)					$4,950,000
Subtotal for Pump Stations					**$21,450,000**

Environmental and Archeological Studies		**Quantity**	**Unit**	**Unit Price**	**Cost**
		426,149	L.F.	$0.57	$243,000
Engineering and Contingencies (30%)					$73,000
					$316,000

Construction Total	**$117,713,000**

Pipeline from Wright Patman to Lake Chapman
60 MGD

Construction Costs

Transmission Facilities

Pipeline Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pipeline	60"	426,149	L.F.	$200	$85,230,000
Right of Way Easement	200 ft.	1,957	Acre	$5,000	$9,783,000
Outlet Structure		1	L.S.	$100,000	$100,000
					$95,113,000
Engineering and Contingencies (30%)					$28,534,000
Subtotal for Pipeline					**$123,647,000**

Pump Station Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pump Station at Wright Patman		1	L.S.	$9,200,000	$9,200,000
Intake Facilities at Wright Patman		1	L.S.	$4,000,000	$4,000,000
Booster Pump Station		1	L.S.	$6,800,000	$6,800,000
Storage Tank(s) at Pump Station	6 MG	1	L.S.	$800,000	$800,000
					$20,800,000
Engineering and Contingencies (30%)					$6,240,000
Subtotal for Pump Stations					**$27,040,000**

Environmental and Archeological Studies		**Quantity**	**Unit**	**Unit Price**	**Cost**
		426,149	L.F.	$0.57	$243,000
Engineering and Contingencies (30%)					$73,000
					$316,000
Construction Total					**$151,003,000**

Pipeline from Wright Patman to Lake Chapman
120 MGD

Construction Costs

Transmission Facilities

Pipeline Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pipeline	78"	426,149	L.F.	$319	$135,942,000
Right of Way Easement	200 ft.	1,957	Acre	$5,000	$9,783,000
Outlet Structure		1	L.S.	$100,000	$100,000
					$145,825,000
Engineering and Contingencies (30%)					$43,748,000
Subtotal for Pipeline					**$189,573,000**
Pump Station Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pump Station at Wright Patman		1	L.S.	$10,800,000	$10,800,000
Intake Facilities at Wright Patman		1	L.S.	$4,000,000	$4,000,000
Booster Pump Station		1	L.S.	$8,300,000	$8,300,000
Storage Tank(s) at Pump Station	6 MG	2	L.S.	$800,000	$1,600,000
					$24,700,000
Engineering and Contingencies (30%)					$7,410,000
Subtotal for Pump Stations					**$32,110,000**
Environmental and Archeological Studies		**Quantity**	**Unit**	**Unit Price**	**Cost**
		426,149	L.F.	$0.57	$243,000
Engineering and Contingencies (30%)					$73,000
					$316,000
Construction Total					**$221,999,000**

Pipeline from Wright Patman to Lake Chapman
200 MGD

Construction Costs

Transmission Facilities

Pipeline Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pipeline	96"	426,149	L.F.	$358	$152,348,000
Right of Way Easement	200 ft.	1,957	Acre	$5,000	$9,783,000
Outlet Structure		1	L.S.	$100,000	$100,000
					$162,231,000
Engineering and Contingencies (30%)					$48,669,000
Subtotal for Pipeline					**$210,900,000**
Pump Station Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pump Station at Wright Patman		1	L.S.	$12,500,000	$12,500,000
Intake Facilities at Wright Patman		1	L.S.	$4,000,000	$4,000,000
Booster Pump Station		1	L.S.	$10,300,000	$10,300,000
Storage Tank(s) at Pump Station	10 MG	2	L.S.	$1,300,000	$2,600,000
					$29,400,000
Engineering and Contingencies (30%)					$8,820,000
Subtotal for Pump Stations					**$38,220,000**
Environmental and Archeological Studies		**Quantity**	**Unit**	**Unit Price**	**Cost**
		426,149	L.F.	$0.57	$243,000
Engineering and Contingencies (30%)					$73,000
					$316,000
Construction Total					**$249,436,000**

Pipeline from Wright Patman to Lake Chapman
250 MGD

Construction Costs

Transmission Facilities

Pipeline Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pipeline	108"	426,149	L.F.	$627	$267,195,000
Right of Way Easement	200 ft.	1,957	Acre	$5,000	$9,783,000
Outlet Structure		1	L.S.	$100,000	$100,000
					$277,078,000
Engineering and Contingencies (30%)					$83,123,000
Subtotal for Pipeline					**$360,201,000**

Pump Station Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pump Station at Wright Patman		1	L.S.	$13,000,000	$13,000,000
Intake Facilities at Wright Patman		1	L.S.	$4,000,000	$4,000,000
Booster Pump Station		1	L.S.	$11,100,000	$11,100,000
Storage Tank(s) at Pump Station	6 MG	1	L.S.	$800,000	$800,000
Storage Tank(s) at Pump Station	10 MG	2	L.S.	$1,300,000	$2,600,000
					$31,500,000
Engineering and Contingencies (30%)					$9,450,000
Subtotal for Pump Stations					**$40,950,000**

Environmental and Archeological Studies	**Quantity**	**Unit**	**Unit Price**	**Cost**
	426,149	L.F.	$0.57	$243,000
Engineering and Contingencies (30%)				$73,000
				$316,000
Construction Total				**$401,467,000**

Pipeline from Wright Patman to Lake Chapman
300 MGD

Construction Costs

Transmission Facilities

Pipeline Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pipeline	120"	426,149	L.F.	$781	$332,822,000
Right of Way Easement	200 ft.	1,957	Acre	$5,000	$9,783,000
Outlet Structure		1	L.S.	$100,000	$100,000
					$342,705,000
Engineering and Contingencies (30%)					$102,812,000
Subtotal for Pipeline					**$445,517,000**
Pump Station Facilities	**Size**	**Quantity**	**Unit**	**Unit Price**	**Cost**
Pump Station at Wright Patman		1	L.S.	$13,300,000	$13,300,000
Intake Facilities at Wright Patman		1	L.S.	$4,000,000	$4,000,000
Booster Pump Station		1	L.S.	$11,800,000	$11,800,000
Storage Tank(s) at Pump Station	10 MG	3	L.S.	$1,300,000	$3,900,000
					$33,000,000
Engineering and Contingencies (30%)					$9,900,000
Subtotal for Pump Stations					**$42,900,000**
Environmental and Archeological Studies		**Quantity**	**Unit**	**Unit Price**	**Cost**
		426,149	L.F.	$0.57	$243,000
Engineering and Contingencies (30%)					$73,000
					$316,000
Construction Total					**$488,733,000**

Appendix J

Quality Control

Design Quality Control Plan
System Operation Assessment of Wright Patman and Jim Chapman Lakes

Contract DACW63-01-D-0001
Delivery Order #7
June 5, 2002

Introduction

By Delivery Order No. 7, dated May 24, 2002, Freese and Nichols, Inc. was contracted to perform a system operation assessment of Wright Patman and Jim Chapman Reservoirs in the Sulphur River Basin. To assure that all services, documents, and reports required by this contract are performed and provided in a manner that meets professional engineering standards, the Project Quality Program procedures of Freese and Nichols will be followed throughout the project.

Project Quality Program

The Project Quality Program at Freese and Nichols consists of two elements – Quality Control and Quality Assurance. The Quality Control program is intended to assure that the reviews and documentation are reported accurately and services are completed within the requirements of the contract, while the Quality Assurance program is an internal check to verify that the Project Manager has developed and is implementing an effective Quality Control plan.

The Quality Control program at Freese and Nichols consists of three parts – a Project Team Review, a Project Manager Review, and a Lead Discipline Leader Review. Each review is documented by completing a Quality Control form, a copy of which is attached. All quality control reviews will be conducted prior to submittal of deliverables.

Project Team Review – Each project team member provides review for the technical correctness and completeness of the work that they perform within a particular discipline, which includes a review of the reports, meeting minutes, interview surveys, submittals and comments received from the Corps review team. Information received electronically or via the internet will be scanned for all known viruses, and any identified errors or deficiencies will be corrected prior to submitting them to the Government.

Project Manager Review – This review is scheduled prior to the delivery of each product to the client, either interim or final, and consists of an interdisciplinary coordination, a cross-checking review to identify and resolve conflicts, and verification that all services conform to the contract requirements.

Lead Discipline Leader Review – The Lead Discipline Leader also makes an overall review of the project which includes, but is not limited to, verification that the intent of the scope of work is met, cross-checks are made between disciplines, adequate details are shown, and the reports are complete.

The Quality Assurance program at Freese and Nichols, Inc., is our internal check to verify that the Quality Control procedures are in place and have been exercised by the Project Team and Project Manager. Quality Assurance reviews will be held at completion of Task 1c, Task 2d and Task 4a. Each Quality Assurance review is documented by completing a Quality Assurance form, a copy of which is attached.

Project Staff – Freese and Nichols, Inc.

Jon Albright, in his role as Project Manager, will be responsible for performing the Project Manager Reviews, and making sure that the Quality Assurance reviews are completed in a timely fashion. He has the responsibility of being present during the times the work is in progress, and shall be cognizant of and assure that all documents on the project have been coordinated.

Thomas C. Gooch, P.E., is the Discipline Leader for the Water Resource Planning Discipline, and will perform the Lead Discipline Leader Reviews for the project. Mr. Gooch is an essential team member for this project due to his experience with USACE projects and his contacts in the water supply industry. He will serve as the alternate person to be present during the times the work is in progress and assure that all documents on the project have been coordinated.

Michael L. Nichols, P.E., in his role as Client Representative, will assist with the Quality Assurance reviews and represent the interests of the Fort Worth District within the project team to make sure the project remains on schedule and within budget.

Andres Salazar, Ph.D., in his role as Lead Project Engineer, will be responsible for coordinating the work and coordinating the Quality Control process. He will also be responsible for conducting the Project Team Reviews for the work that he performs on the project.

Stephanie W. Griffin, P.E., Simone Kiel and Barbara Nickerson, in their role as Project Engineers, will be responsible for conducting the Project Team Reviews for the work that they perform on the project.

The following is a listing of the roles, contacts, and responsibilities of the Freese and Nichols project team for the System Operation Assessment of Wright Patman and Jim Chapman Lakes.

Project Team
System Operation Assessment of Wright Patman and Jim Chapman Lakes

Person	Project Role	Phone Number	Quality Task
Jon Albright	Project Manager	(817) 735-7267	Project Manager Reviews
Thomas C. Gooch, P.E.	Discipline Leader	(817) 735-7314	Lead Discipline Leader Reviews
Michael L. Nichols, P.E.	Client Representative	(817) 735-7235	Quality Assurance Reviews
Andres Salazar, Ph.D.	Lead Project Engineer	(817) 735-7292	Project Team Reviews
Stephanie Griffin, P.E.	Project Engineer	(817) 735-7353	Project Team Reviews
Simone Kiel, E.I.T.	Project Engineer	(817) 735-7446	Project Team Reviews
Barbara Nickerson	Project Engineer	(817) 735-7273	Project Team Reviews

QUALITY CONTROL

FREESE•NICHOLS *Project Quality Program*

Owner:	U.S. Army Corps of Engineers	**Project Number:**	COE02291
Project Title:	Patman/Chapman System Operation	**Percent Complete:**	
Client Representative:	MLN	**Meeting No.:**	
Project Manager:	JSA	**Discipline or Office:**	WR Planning

1. Review the Professional Services Agreement and any amendments. Are there any problems with the Professional Services Agreement (i.e. scope, schedule, budget and deliverables)? Review changes in Professional Services Agreement. Have the changes been communicated to the design team?

2. Review the selected concept approach. Verify (a) that a reasonable and effective approach has been proposed from the viewpoint of the discipline and (b) that the approach complies with the Professional Services Agreement. Review any modifications in the design concept.

3. Review design report for technical correctness, organization and writing.

4. Review and verify that calculations are complete, accurate, in accordance with the Design Report (if applicable), and conform to standard design criteria of the engineering profession (Each discipline should utilize their own QC checklist).

5. Are FNI's standard specifications to be used? If not, has the discipline leader reviewed the proposed specifications? Any action required?

6. Are FNI's standard drawings to be used? If not, has the discipline leader reviewed the proposed drawing format? Any action required?

7. Review the adequacy and quality of drawings prepared to date and verify conformance of drawings to FNI standards and guidelines. Verify specifications and drawings are compatible.

8. Evaluate equipment specified and provisions for alternates.

9. Verify the cost opinion is reasonable. Who is responsible for the opinion? Has Construction Services reviewed it? Is the cost opinion within the client budget and expectation?

10. Review the design approach. Verify the reasonableness of the results.

11. Verify design criteria and standards to be used, including criteria to be followed by subconsultants. Verify communications procedures with any subconsultant and the scope of their assignment. Review progress and quality of work being performed by subconsultants. Verify subconsultants have reviewed the plans and specifications to determine compatibility with recommendations.

12. Determine how the work fits with the work of all others involved in the project. Has the work been coordinated with all others involved in the project?

13. Verify that all the requirements for the Texas Accessibility Standards (TAS) and American Disability Act (ADA) have been met and addressed.

14. Verify that adequate and qualified staffs are working on the project.

15. Identify and resolve any problems.

16. Verify work is within budget and on schedule.

17. Verify that specifications, drawings, and reports are properly stamped or sealed, including interim products.

Reviewed and found in compliance with Freese and Nichols Quality Review Program:

QC Reviewer	Date
Project Manager	Date

QUALITY ASSURANCE

Owner:	U.S. Army Corps of Engineers	**Project Number:**	COE02291
Project Title:	Patman/Chapman System Operation	**Percent Complete:**	
Client Representative:	MLN	**Meeting No.:**	
Project Manager:	JSA	**Discipline or Office:**	WR Planning

10%

1. **Has kickoff meeting been held?**
2. **Have QC Reviews and QA Reviews been scheduled?**
3. Review the Professional Services Agreement. Are there any problems etc? Review changes in Professional Services Agreement. Have the changes been documented and approved by the client? Are documents filed in the Accounting Department?
4. Has project schedule been prepared? Does it agree with the Professional Services Agreement?
5. Have subcontracts been executed? Are documents filed in the Accounting Department?
6. Have team members been assigned?
7. Have project deliverables been clearly identified and defined?
8. Have client reviews been scheduled?
9. *What front-end documents are to be used— FNI standards or other? If the front-end documents are not FNI, has Construction Services reviewed them?*
10. What obstacles/challenges are anticipated?
11. Have critical or unique aspects of the project been identified?
12. Have you developed an opinion of probable construction costs? Does the client have adequate funds? How does it compare with previous opinions provided?
13. What is the project fee? Is the project within budget? Were you involved in preparing the budget? Are you comfortable with the budget?
14. Have you identified and coordinated all required permits, regulatory reviews and funding applications?
15. Have you talked/coordinated with the Client Representative about his/her involvement?

50% - 90%

1. **Has the QC Review been completed?**
2. **Is the Quality Control process in place for all subconsultants?**
3. **On multi-discipline projects, has the interdiscipline QC review by the Project Manager or designee been completed?**
4. **Has the discipline leader or office manager reviewed the various report/design concepts and approved the selected approach?**
5. Review the Professional Services Agreement. Are there any problems meeting what has been agreed upon in the Professional Services Agreement (i.e. scope, schedule,deliverables)?
6. Identify Project Team members, subconsultants, etc. Are subcontracts in place? Are subcontracts filed in the Accounting Department?
7. Are there any staffing or support problems?
8. Were alternate design concepts considered? Does the number and scope comply with Professional Services Agreement requirements? Review modifications to original selected concept. Were the modifications made by the client or FNI? Were the modifications reviewed with the client?
9. Review the basis for selection of the proposed concept.
10. When is the selected concept to be reviewed by the client?
11. What are the client's specific needs and expectations? How is the Design Team meeting those needs? Review of communications with client.
12. *What front-end documents are to be used— FNI standards or other? If the front-end documents are not FNI, has Construction Services reviewed them? Has client provided bond and insurance requirements?*
13. *Are FNI's standard specifications to be used? If not, has the discipline leader approved the proposed specifications?*
14. *Are FNI's standard drawings to be used? If not, any action required?*
15. Are there any current or anticipated problems?
16. Are reports/drawings and/or specifications to be delivered to client in some digital form (computer format)? If yes, have you verified required format?
17. *What is the status of construction contract documents and specifications?*
18. Has there been coordination with the client's review process?
19. Assess overall quality of work.
20. What is the project schedule, including milestones of deliverables? How are we doing?
21. Have client contacts or visits been made according to the Professional Services Agreement?
22. Are there any concerns from the client's perspective that would prevent them from recommending or considering FNI for future projects? If yes, have you contacted the CR to coordinate resolution?
23. Have you verified that design specifications, drawings and/or reports have been properly stamped or sealed, including any disclaimers, in accordance with current requirements?
24. Develop an opinion of probable construction costs - does the client have adequate funds? How does it compare with previous opinions provided?

- Questions in **bold** signify continue/do not continue the QA Review
- Questions in *italics* are not applicable to reports and studies

Reviewed and found in compliance with Freese and Nichols Quality Review Program:

QA Reviewer	Date
Project Manager	Date

COE02291 1.40

FREESE-NICHOLS

QUALITY ASSURANCE

Owner: U.S. Army Corps of Engineers
Project Number: COE02291
Project Title: Patman/Chapman System Operation
Percent Complete: 10%
Client Representative: MLN
Meeting No.: 1
Project Manager: JSA
Discipline or Office: WR Planning

10%

1. **Has kickoff meeting been held?**
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14. *Are FNI's standard drawings to be used? If not, any action required?*
15. Are there any current or anticipated problems?
16. Are reports/drawings and/or specifications to be delivered to client in some digital form (computer format)? If yes, have you verified required format?
17. *What is the status of construction contract documents and specifications?*
18. Has there been coordination with the client's review process?
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20. What is the project schedule, including milestones of deliverables? How are we doing?
21. Have client contacts or visits been made according to the Professional Services Agreement?
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23. Have you verified that design specifications, drawings and/or reports have been properly stamped or sealed, including any disclaimers, in accordance with current requirements?
24. Develop an opinion of probable construction costs - does the client have adequate funds? How does it compare with previous opinions provided?

- Questions in **bold** signify continue/do not continue the QA Review
- Questions in *italics* are not applicable to reports and studies

Reviewed and found in compliance with Freese and Nichols Quality Review Program:

Will McDonald — QA Reviewer — 6-26-02 — Date

Jim S. Allen — Project Manager — 6/26/02 — Date

FREESE-NICHOLS

QUALITY ASSURANCE

Owner: U.S. Army Corps of Engineers
Project Number: COE02291
Project Title: Patman/Chapman System Operation
Percent Complete:
Client Representative: MLN
Meeting No.:
Project Manager: JSA
Discipline or Office: WR Planning

10%

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6. Have team members been assigned?
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8. Have client reviews been scheduled?
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11. Have critical or unique aspects of the project been identified?
12. Have you developed an opinion of probable construction costs? Does the client have adequate funds? How does it compare with previous opinions provided?
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50% - 90%

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22. Are there any concerns from the client's perspective that would prevent them from recommending or considering FNI for future projects? If yes, have you contacted the CR to coordinate resolution?
23. Have you verified that design specifications, drawings and/or reports have been properly stamped or sealed, including any disclaimers, in accordance with current requirements?
24. Develop an opinion of probable construction costs - does the client have adequate funds? How does it compare with previous opinions provided?

- Questions in **bold** signify continue/do not continue the QA Review
- Questions in *italics* are not applicable to reports and studies

Reviewed and found in compliance with Freese and Nichols Quality Review Program:

Stephen J. Fitzhugh
QA Reviewer

8/25/02
Date

Project Manager

8/25/02
Date

Comments from Marty Hathorn, Environmental Resources Branch:

1. Insert title "System Operation Assessment of Jim Chapman and Wright Patman Lakes" as header on first page of each Chapter.

2. Rewrite the last sentence of the second paragraph in Section 1.1 as "The Corps of Engineers **again** contracted with FNI to conduct this *System Operation Assessment of Jim Chapman and Wright Patman Lakes*, **which** is a continuation of studies under the TWAA appropriation.

Comments from Steve Pilney, Reservoir Control Branch:

1. In paragraph 1.2,page 1-1, in the sentence "To determine the potential in yield if Lakes Patman and Chapman are ...", the words Wright and Jim were omitted from the Lake names.

2. In paragraph 2.4,page 2-9, the sentence should read "The relationship between water surface elevation at Lake Wright Patman and inundation at the WMA is complex because it is also dependent **on** the flow ...". The word "on" was omitted.

3. In paragraph 5.7,page 5-18, the sentence should read "In these runs, interruptible demand is unavailable when Lake Jim Chapman is below **430.0** feet ...". The sentence had elevation 330.0 feet.

4. In paragraph 6.2, page 6-7, the last potential issue number should be **17.** instead of 1.

In chapter 6, I believe the conclusion about changes in releases from Lake Wright Patman should be included in the "Conclusions". This statement is important to the people who work in Reservoir Control Branch.

Comments from Kevin Craig, Project Manager:

(Revisions to Executive Summary are included in a separate, edited file entitled "ExecSumm(revcmnts).

1. Page 2-1, 1st sentence: Italicize "System Operation Assessment of Jim Chapman and Wright Patman Lakes"

2. Page 2-1, Section 2.1: First sentence refers to Figure 2.1, but the figure is not included.

3. Page 2-2, Table 2-1: Change "Tributary water rights" to "**Tributaries**", since column heading is "Location"

4. Page 2-2, Section 2.2, 2nd paragraph, first sentence: Change "National Environmental Protection Act" to "National Environmental **Policy** Act".

5. Page 5-10, third sentence: Change "of" to "or" (i.e., "However, an inspection of the frequency of elevations near **or** slightly above…"**)**

6. Page 6-1: Need to explain how to read figures (i.e., "Percentile" means the percent of time water surface elevations are below the "Reservoir Elevation" indicated on the graph)

7. Page 6-4, 2nd bullet in Section 6.1: Add the following to the end of the bullet, "**Accessing the increased yield from Lake Wright Patman reallocation would require construction of a large-capacity pipeline**."

8. Page 6-5, 3rd bullet in Section 6.1, last sentence: rewrite as "Higher pumping rates can produce even more yield but would **likely** be impractical to implement (see Appendix F)."

9. Page 6-5, 4th bullet in Section 6.1: Reword as "**System operation of the two reservoirs could result in higher total yields from the basin. However, implementing system operation would require construction of additional large-capacity pipeline and pumping systems. Because of the high cost of transmission and pumping facilities, an economic evaluation should be conducted before committing to implementation of any of the alternatives investigated in this study. System operation is less likely to be economical as a stand-alone project, but it may be economical in conjunction with reallocation of storage in Lake Wright Patman.**"

10. Page 6-5, Section 6.2, 2nd sentence: Insert the word "**alone**" after "Although system operation"

FREESE • NICHOLS

Simon W. Freese, P.E. 1900-1990
Marvin C. Nichols, P.E. 1896-1969

MEMORANDUM

To: Kevin Craig, USACOE Ft.Worth

From: Jon S. Albright

Re: Response to Comments on Patman/Chapman Report

Date: December 30, 2002

Copies to: File

Comments from Marty Hathorn, Environmental Resources Branch:

1. Insert title "System Operation Assessment of Jim Chapman and Wright Patman Lakes" as header on first page of each Chapter.

   Text inserted at the beginning of each chapter and the Executive Summary.

2. Rewrite the last sentence of the second paragraph in Section 1.1 as "The Corps of Engineers again contracted with FNI to conduct this *System Operation Assessment of Jim Chapman and Wright Patman Lakes*, which is a continuation of studies under the TWAA appropriation.

   Change accepted.

Comments from Steve Pilney, Reservoir Control Branch:

1. In paragraph 1.2,page 1-1, in the sentence "To determine the potential in yield if Lakes Patman and Chapman are ...", the words Wright and Jim were omitted from the Lake names.

   Change accepted.

2. In paragraph 2.4,page 2-9, the sentence should read "The relationship between water surface elevation at Lake Wright Patman and inundation at the WMA is complex because it is also dependent on the flow ...". The word "on" was omitted.

   Change accepted.

3. In paragraph 5.7,page 5-18, the sentence should read "In these runs, interruptible demand is unavailable when Lake Jim Chapman is below 430.0 feet ...". The sentence had elevation 330.0 feet.

   Change accepted.

4. In paragraph 6.2, page 6-7, the last potential issue number should be 17. instead of 1.

   Change accepted.

5. In chapter 6, I believe the conclusion about changes in releases from Lake Wright Patman should be included in the "Conclusions". This statement is important to the people who work in Reservoir Control Branch.

   The following text was added to Chapter 6:

   - *Changes in water conservation storage in Lake Wright Patman have more impact than implementation of system operation on downstream releases.*

<u>Comments from Kevin Craig, Project Manager:</u>

1. (Revisions to Executive Summary are included in a separate, edited file entitled "ExecSumm(revcmnts).

   Changes accepted with one exception (see item 8 below).

2. Page 2-1, 1st sentence: Italicize "System Operation Assessment of Jim Chapman and Wright Patman Lakes"

   Change accepted.

3. Page 2-1, Section 2.1: First sentence refers to Figure 2.1, but the figure is not included.

   Figure 2-1 was inadvertently left out of the last submittal. The figure, minus the FNI logo, will be included in the final report.

4. Page 2-2, Table 2-1: Change "Tributary water rights" to "Tributaries", since column heading is "Location"

Change accepted.

5. Page 2-2, Section 2.2, 2nd paragraph, first sentence: Change "National Environmental Protection Act" to "National Environmental Policy Act".

   Change accepted.

6. Page 5-10, third sentence: Change "of" to "or" (i.e., "However, an inspection of the frequency of elevations near or slightly above…")

   Change accepted.

7. Page 6-1: Need to explain how to read figures (i.e., "Percentile" means the percent of time water surface elevations are below the "Reservoir Elevation" indicated on the graph)

   I changed the x-axis label to "Percent of Time Equaled or Exceeded" and reversed the scale to match examples provided by the Corps. The following text was added to the document:

   These figures illustrate the relative frequency that a particular elevation or downstream release might occur under a particular set of operating criteria, offering a direct, simple means of comparing the results of various simulation runs. The x-axis gives the percentage of time that an elevation or release greater than or equal to the given value might occur during the 62-year simulation period. For example, Figure 6-1 shows that Lake Jim Chapman is expected to be at or above its conservation storage (elevation 440.0 feet NVGD) about 18% of the time under stand-alone operation.

8. Page 6-4, 2nd bullet in Section 6.1: Add the following to the end of the bullet, "Accessing the increased yield from Lake Wright Patman reallocation would require construction of a large-capacity pipeline."

   Because it is possible that the additional yield might be accessed in other ways (used locally or released downstream), the following text was added to Chapter 6 and the Executive Summary:

   Accessing the increased yield from Lake Wright Patman reallocation would most likely *require construction of a large-capacity pipeline."*

9. Page 6-5, 3rd bullet in Section 6.1, last sentence: rewrite as "Higher pumping rates can produce even more yield but would likely be impractical to implement (see Appendix F)."

   Change accepted.

10. Page 6-5, 4th bullet in Section 6.1: Reword as "System operation of the two reservoirs could result in higher total yields from the basin. However, implementing system operation would require construction of additional large-capacity pipeline and pumping systems. Because of the high cost of transmission and pumping facilities, an economic evaluation should be conducted before committing to implementation of any of the alternatives investigated in this study. System operation is less likely to be economical as a stand-alone project, but it may be economical in conjunction with reallocation of storage in Lake Wright Patman."

    Change accepted.

11. Page 6-5, Section 6.2, 2nd sentence: Insert the word "alone" after "Although system operation"

    Change accepted.

Freese
and Nichols, Inc. Engineers Environmental Scientists Architects

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December 13, 2002

Kathy Boydston
Carl Fentriss
Nathan Garner
Dennis Gissell
Tom Heger
John Jones
Herb Kothmann
Kevin Kraai
Cindy Loeffler
Rollin MacRae

Texas Parks and Wildlife Department

Re: Second Draft System Operation Assessment of Lake Wright Patman and Lake Jim Chapman

Thank you for taking time to review the October 2002 *Draft System Operation Assessment of Lake Wright Patman and Lake Jim Chapman*. Unfortunately, the comments in your November 18 memorandum are beyond the scope of the current study and cannot be addressed in the final report. A synopsis of your comments has been added to the conclusions section of the second draft report (Chapter 6) as suggestions for additional studies. Please review this section to see if it covers your concerns.

We are sending you a second draft of the study on CD ROM. Chapters 4 and 5 of the second draft have been largely rewritten. If you have time, we would appreciate your comments on these chapters specifically and the rest of the report in general. However, please keep in mind that this particular study is complete and is in the report stage. Additional analyses will need to be undertaken in future studies.

Please call me at (817) 725-7267 if you have any questions or comments.

Sincerely,

Jon S. Albright

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