

RECLAMATION

Managing Water in the West

June 8, 2017

Dear Customer:

Attached is the monthly water supply outlook and projected operations for Yellowtail Dam and Powerplant. Streamflows into Bighorn Lake during May were 296% of average. On June 1, the NRCS measured the snow water content of the mountain snowpack in the Bighorn River Basin at 182% of average. Based on the June 1 water supply forecast and the planned releases out of Boysen and Buffalo Bill Reservoirs, the June through July runoff into Bighorn Lake is expected to equal 1,083,500 acre-feet (161% of average). If you have any questions or concerns, please feel free to call me at 406-247-7334 or Stephanie Micek 406-247-7320.

Clayton R. Jordan
Reservoir and River Operations



U. S. Department of the Interior
Bureau of Reclamation
Montana Area Office
River and Reservoir Operations

YELLOWTAIL RESERVOIR OPERATIONS
 Water Supply Forecasts and Reservoir Operations
 June 1, 2017

Present Elevations & Storages:

	Elevation (feet)	Storage (acre-feet)	Percent of Average	Percent Full
Boysen	4709.32	483,364	87	65
Buffalo Bill	5349.07	331,880	74 *	51
Bighorn Lake	3605.78	740,400	90	73

Actual Inflows (1,000's of Acre-Feet):

Water Year 2017	Inflow	Percent of Average
October	202.6	127
November	139.9	116
December	109.2	106
January	120.5	117
February	212.9	200
March	306.7 (highest of record)	216
April	603.4 (highest of record)	411
May	813.0 (highest of record)	296
Water Year 2016	Inflow	Percent of Average
May	358.3	131
June	422.8	97
July	128.7	50
August	135.9	91
September	180.9	111
April-July	1,031.8	93

Actual Gains between Boysen and Buffalo Bill to Yellowtail (1,000's of Acre-Feet):

Water Year 2017	Gains	Percent of Average
October	116.9	177
November	77.5	136
December	40.2	106
January	51.8	129
February	144.0 (highest of record)	293
March	98.0	137
April	136.5 (highest of record)	411
May	143.7	272
Water Year 2016	Gains	Percent of Average
May	21.5	40
June	-37.0 (avg. 92.6)	-
July	-97.7 (avg. -61.4)	-
August	-55.1 (avg. -52.7)	-
September	47.9	504
April-July	-78.1 (avg. 117.8)	-

June 1 Runoff Forecast (June through July Inflows - 1,000's of Acre-Feet):

Inflows	Percent of Average
1,083,500	161

Average based on past 30 years

*This does not reflect the 30 year average because in 1992 the capacity of the reservoir was increased to approximately 646,565 acre-feet as a result of raising the dam. The average used here reflects data from 1993 through 2016.

SNOW and PRECIPITATION UPDATE
Based on Mountain Data from NRCS SNOTEL Sites
As of June 1, 2017

BASIN Data Site Name	Elev.	Snow Water Equivalent			Total Precipitation		
	feet	Current	Median	% Median	Current	Median	% Median
UPPER YELLOWSTONE RIVER BASIN							
Beartooth Lake	9360	29.5	17.1	173	33.4	25.2	133
Box Canyon	6670	.0	.0	*	17.2	17.6	98
Brackett Creek	7320	1.3	3.1	42	37.7	34.9	108
Burnt Mtn Canyon	5880 7870	.0 .0	.0 .0	* *	24.1 30.2	20.8 21.0	116 144
Cole Creek	7850	10.7	9.2	116	19.7	21.3	92
East Boulder Mine	6335	.0	-M	*	24.2	-M	*
Evening Star	9200	30.3	17.8	170	51.3	34.9	147
Fisher Creek	9100	38.7	28.1	138	53.8	40.1	134
Monument Peak	8850	13.8	15.3	90	35.9	28.3	127
Northeast Entrance	7350	.0	.0	*	23.8	16.7	143
Parker Peak	9400	27.2	13.8	197	41.6	23.8	175
Placer Basin	8830	14.8	13.1	113	30.7	26.9	114
Porcupine	6500	.0	.0	*	19.4	18.3	106
Sacajawea	6550	.0	.0	*	34.7	31.3	111
Shower Falls	8100	16.8	17.0	99	39.4	33.5	118
S Fork Shields	8100	10.4	9.0	116	35.4	29.6	120
Sylvan Lake	8420	8.0	6.6	121	43.7	29.3	149
Sylvan Road	7120	.0	.0	*	33.3	21.3	156
Thumb Divide	7980	.0	.0	*	31.5	23.8	132
Two Ocean Plateau	9240	-M	24.9	*	-M	34.4	*
White Mill	8700	24.5	16.9	145	40.8	30.4	134
Wolverine	7650	.0	.0	*	24.8	16.5	150
Younts Peak	8350	.0	3.2	0	35.4	20.7	171
Basin Index (%)					133		130
WIND RIVER BASIN (WYOMING)							
Burroughs Creek	8750	.0	-M	*	30.6	-M	*
Castle Creek	8400	.0	-M	*	19.3	-M	*
Cold Springs	9630	.0	.0	*	25.1	15.4	163
Deer Park	9700	29.4	3.1	948	48.0	27.0	178
Hobbs Park	10100	28.6	6.1	469	38.9	20.5	190
Kirwin	9550	13.6	1.7	800	31.4	16.9	186
Little Warm	9370	5.7	.0	*	28.3	18.4	154
Owl Creek	8975	.0	.0	*	17.6	10.7	164
South Pass	9040	23.7	.2	11850*	38.2	23.6	162
St. Lawrence Alt	8620	.0	.0	*	23.5	14.5	162
Togwotee Pass	9580	28.0	19.0	147	44.9	31.0	145
Townsend Creek	8700	6.7	.0	*	32.2	18.2	177
Younts Peak	8350	.0	3.2	0	35.4	20.7	171
Basin Index (%)					408*		168
SHOSHONE RIVER BASIN (WYOMING)							
Blackwater	9780	34.1	19.6	174	48.5	27.4	177
Evening Star	9200	30.3	17.8	170	51.3	34.9	147
Marquette	8760	10.3	-M	*	26.7	-M	*
Sylvan Lake	8420	8.0	6.6	121	43.7	29.3	149
Sylvan Road	7120	.0	.0	*	33.3	21.3	156
Younts Peak	8350	.0	3.2	0	35.4	20.7	171
Basin Index (%)					153		159

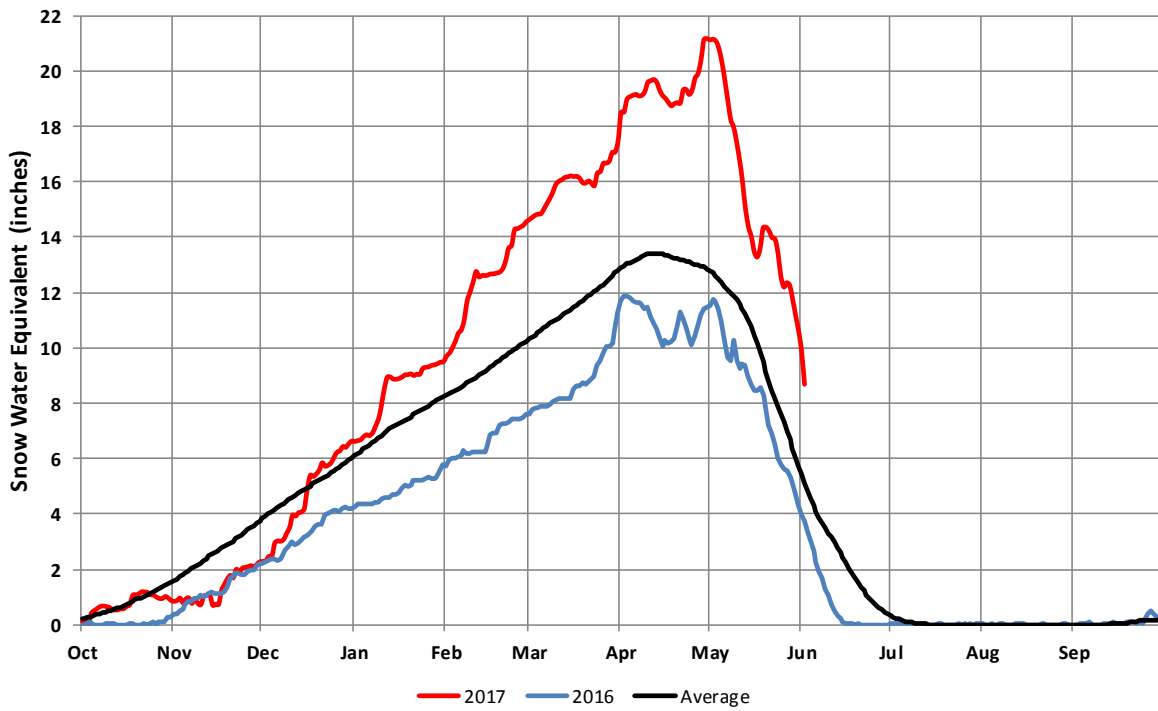
SNOW and PRECIPITATION UPDATE
Based on Mountain Data from NRCS SNOTEL Sites
As of June 1, 2017

BASIN Data Site Name	Elev.	Snow Water Equivalent			Total Precipitation		
		Current	Median	% Median	Current	Median	% Median
BIGHORN BASIN ABOVE YELLOWTAIL DAM							
Bald Mtn.	9380	17.6	13.7	128	23.8	23.5	101
Bear Trap Meadow	8200	.0	.0	*	17.6	13.8	128
Blackwater	9780	34.1	19.6	174	48.5	27.4	177
Bone Springs Div	9350	13.6	8.6	158	24.0	22.2	108
Burroughs Creek	8750	.0	-M	*	30.6	-M	*
Castle Creek	8400	.0	-M	*	19.3	-M	*
Cold Springs	9630	.0	.0	*	25.1	15.4	163
Deer Park	9700	29.4	3.1	948	48.0	27.0	178
Evening Star	9200	30.3	17.8	170	51.3	34.9	147
Grave Springs	8550	.0	.0	*	16.1	16.2	99
Kirwin	9550	13.6	1.7	800	31.4	16.9	186
Little Warm	9370	5.7	.0	*	28.3	18.4	154
Marquette	8760	10.3	-M	*	26.7	-M	*
Middle Powder	7760	.0	.0	*	16.5	17.4	95
Owl Creek	8975	.0	.0	*	17.6	10.7	164
Powder River Pass	9480	.0	.0	*	19.6	18.7	105
Shell Creek	9580	11.2	8.9	126	19.9	19.9	100
South Pass	9040	23.7	.2	11850*	38.2	23.6	162
St. Lawrence Alt	8620	.0	.0	*	23.5	14.5	162
Sylvan Lake	8420	8.0	6.6	121	43.7	29.3	149
Sylvan Road	7120	.0	.0	*	33.3	21.3	156
Timber Creek	7950	.0	.0	*	19.1	13.6	140
Togwotee Pass	9580	28.0	19.0	147	44.9	31.0	145
Townsend Creek	8700	6.7	.0	*	32.2	18.2	177
Younts Peak	8350	.0	3.2	0	35.4	20.7	171
Basin Index (%)					217*		145

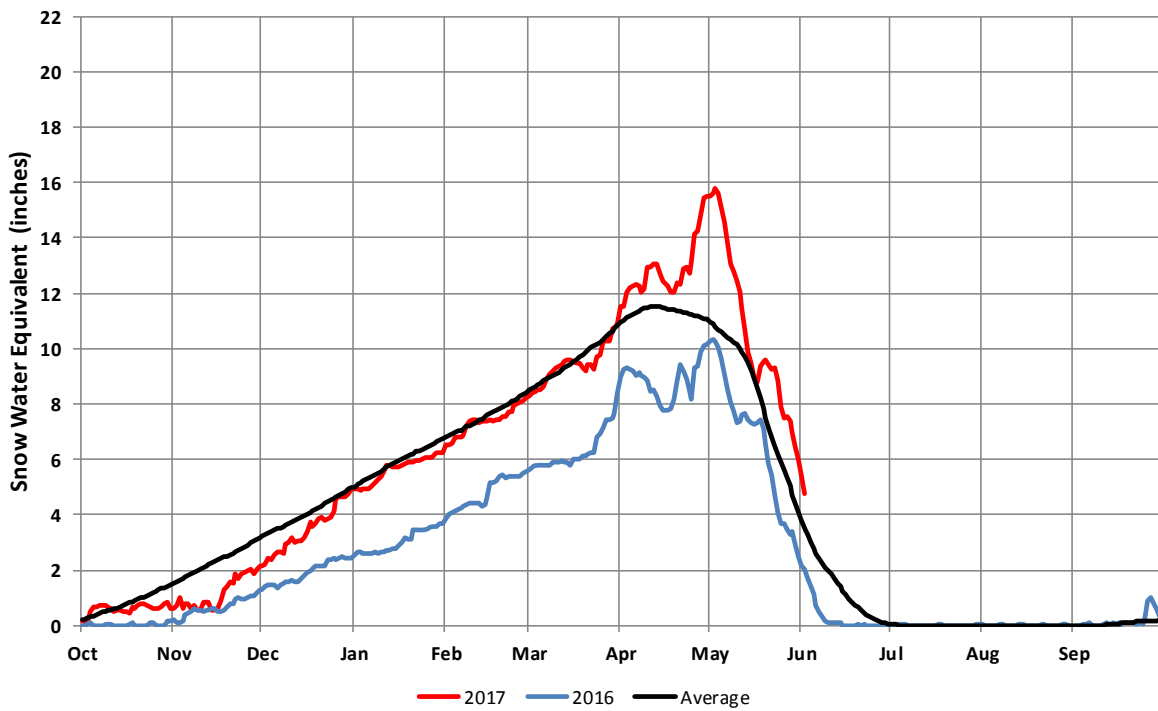
-M = Missing data

* = Data may not provide a valid measure of conditions.

Snowpack above Bighorn Lake



Snowpack in Bighorn Mountains



Based on Most Probable Inflow Forecast (June-July Inflow: 1,083.5 KAF)

BIGHORN LAKE MONTHLY OPERATIONS

Bighorn Reservoir		Initial Cont		740.4 kaf		Maximum Cont		1278.9 kaf		Minimum Cont		469.9 kaf		
		Elev		3605.78 ft		Elev		3657.00 ft		Elev		3547.00 ft		
	2017	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Boysen Release	kaf	348.1	150.4	107.1	80.6	61.5	59.5	61.5	61.5	55.5	61.5	130.9	139.5	1317.6
Boysen Release	cfs	5850	2446	1742	1355	1000	1000	1000	1000	999	1000	2200	2269	
Buffalo Bill Release	kaf	244.0	156.3	123.9	97.3	49.2	21.1	21.8	21.8	19.8	21.8	28.1	119.2	924.3
Buffalo Bill Release	cfs	4101	2542	2015	1635	800	355	355	355	357	355	472	1939	
Station Gain	kaf	208.6	-23.9	-35.2	28.7	76.7	64.7	44.9	50.5	59.7	76.9	39.9	62.2	653.7
Monthly Inflow	kaf	800.7	282.8	195.8	206.6	187.4	145.3	128.2	133.8	135.0	160.2	198.9	320.9	2895.6
Monthly Inflow	cfs	13456	4599	3184	3472	3048	2442	2085	2176	2431	2605	3343	5219	
Turbine Release	kaf	357.0	213.5	207.2	203.7	195.5	178.5	184.5	184.5	166.6	184.5	218.2	276.4	2570.1
Bypass/Spill/Waste	kaf	232.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	232.8
Total Release	kaf	589.8	213.5	207.2	203.7	195.5	178.5	184.5	184.5	166.6	184.5	218.2	276.4	2802.9
Total Release	cfs	9912	3472	3370	3423	3180	3000	3001	3001	3000	3001	3667	4495	
Spring Flow	kaf	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	4.3	4.2	4.3	50.8
Irrigation Reqmnt	kaf	22.8	28.1	27.0	17.5	3.0	0.0	0.0	0.0	0.0	0.0	1.3	11.9	111.6
Afterbay Rels	kaf	594.0	217.8	211.5	207.9	199.8	182.7	188.8	188.8	170.5	188.8	222.4	280.7	2853.7
Afterbay Rels	cfs	9983	3542	3440	3494	3249	3070	3071	3071	3070	3071	3738	4565	
River Release	kaf	571.2	189.7	184.5	190.4	196.8	182.7	188.8	188.8	170.5	188.8	221.1	268.8	2742.1
River Release	cfs	9599	3085	3001	3200	3201	3070	3071	3071	3070	3071	3716	4372	
Min Release	kaf	571.2	184.5	184.5	190.4	196.8	89.3	92.2	92.2	83.3	92.2	89.3	92.2	1958.1
End-Month Content	kaf	951.3	1020.6	1009.2	1012.1	1004.0	970.8	914.5	863.8	832.2	807.9	788.6	833.1	
End-Month Elevation	ft	3634.04	3640.00	3639.09	3639.32	3638.66	3635.82	3630.34	3624.47	3620.40	3617.00	3614.06	3620.52	
Net Change Content	kaf	210.9	69.3	-11.4	2.9	-8.1	-33.2	-56.3	-50.7	-31.6	-24.3	-19.3	44.5	92.7
Yellowtail Power	2017	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Turbine Release	kaf	357.0	213.5	207.2	203.7	195.5	178.5	184.5	184.5	166.6	184.5	218.2	276.4	2570.1
Generation	gwh	145.800	86.816	83.822	82.290	78.474	70.320	72.148	71.202	62.722	69.998	83.870	109.234	1016.696
End-Month Power Cap	mw	281.9	287.5	286.7	286.9	286.3	283.6	278.3	272.8	268.9	265.7	262.9	269.0	
% Max Gen		70	41	39	40	37	34	34	33	32	33	40	51	
Ave kwh/af		408	407	405	404	401	394	391	386	376	379	384	395	396
Upstream Generation	gwh	32.915	35.212	32.328	27.315	17.983	10.815	11.132	11.048	9.919	10.907	16.771	33.556	249.901
Total Generation	gwh	178.715	122.028	116.150	109.605	96.457	81.135	83.280	82.250	72.641	80.905	100.641	142.790	1266.597

Based on Minimum Probable Inflow Forecast (June-July Inflow: 633.1 KAF)

BIGHORN LAKE MONTHLY OPERATIONS

Bighorn Reservoir		Initial Cont	740.4 kaf		Maximum Cont	1278.9 kaf		Minimum Cont	469.9 kaf					
		Elev	3605.78 ft		Elev	3657.00 ft		Elev	3547.00 ft					
	2017	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Boysen Release	kaf	175.5	126.0	89.3	74.4	61.5	59.5	61.5	61.5	55.5	61.5	59.5	106.9	992.6
Boysen Release	cfs	2949	2049	1452	1250	1000	1000	1000	1000	999	1000	1000	1739	
Buffalo Bill Release	kaf	157.8	118.4	111.4	73.1	35.3	12.2	12.6	12.6	11.4	12.6	47.5	77.9	682.8
Buffalo Bill Release	cfs	2652	1926	1812	1228	574	205	205	205	205	205	798	1267	
Station Gain	kaf	116.8	-61.4	-45.5	16.1	54.9	60.3	41.1	46.3	54.4	72.0	20.3	10.0	385.3
Monthly Inflow	kaf	450.1	183.0	155.2	163.6	151.7	132.0	115.2	120.4	121.3	146.1	127.3	194.8	2060.7
Monthly Inflow	cfs	7564	2976	2524	2749	2467	2218	1874	1958	2184	2376	2139	3168	
Turbine Release	kaf	357.0	116.0	114.9	102.6	90.9	161.2	166.6	166.6	150.5	166.7	131.0	130.6	1854.6
Bypass/Spill/Waste	kaf	78.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78.1
Total Release	kaf	435.1	116.0	114.9	102.6	90.9	161.2	166.6	166.6	150.5	166.7	131.0	130.6	1932.7
Total Release	cfs	7312	1887	1869	1724	1478	2709	2709	2709	2710	2711	2202	2124	
Spring Flow	kaf	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	4.3	4.2	4.3	50.8
Irrigation Reqmnt	kaf	22.8	28.1	27.0	17.5	3.0	0.0	0.0	0.0	0.0	0.0	1.3	11.9	111.6
Afterbay Rels	kaf	439.3	120.3	119.2	106.8	95.2	165.4	170.9	170.9	154.4	171.0	135.2	134.9	1983.5
Afterbay Rels	cfs	7383	1956	1939	1795	1548	2780	2779	2779	2780	2781	2272	2194	
River Release	kaf	416.5	92.2	92.2	89.3	92.2	165.4	170.9	170.9	154.4	171.0	133.9	123.0	1871.9
River Release	cfs	7000	1499	1499	1501	1499	2780	2779	2779	2780	2781	2250	2000	
Min Release	kaf	416.5	92.2	92.2	89.3	92.2	89.3	92.2	92.2	83.3	92.2	133.9	123.0	1488.5
End-Month Content	kaf	755.4	822.4	862.7	923.7	984.5	955.3	903.9	857.7	828.5	807.9	804.2	868.4	
End-Month Elevation	ft	3608.50	3619.06	3624.33	3631.32	3637.02	3634.41	3629.18	3623.71	3619.90	3617.00	3616.45	3625.04	
Net Change Content	kaf	15.0	67.0	40.3	61.0	60.8	-29.2	-51.4	-46.2	-29.2	-20.6	-3.7	64.2	128.0
Yellowtail Power	2017	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Turbine Release	kaf	357.0	116.0	114.9	102.6	90.9	161.2	166.6	166.6	150.5	166.7	131.0	130.6	1854.6
Generation	gwh	145.800	40.675	40.696	36.056	31.539	62.291	63.981	63.197	55.619	62.279	46.791	47.542	696.466
End-Month Power Cap	mw	257.6	267.6	272.6	279.3	284.7	282.2	277.2	272.0	268.4	265.7	265.2	273.3	
% Max Gen		70	19	19	17	15	30	30	29	29	29	23	22	
Ave kwh/af		408	351	354	351	347	386	384	379	370	374	357	364	376
Upstream Generation	gwh	33.337	32.387	28.908	19.983	13.406	8.016	8.234	8.145	6.448	7.986	16.633	22.593	206.076
Total Generation	gwh	179.137	73.062	69.604	56.039	44.945	70.307	72.215	71.342	62.067	70.265	63.424	70.135	902.542

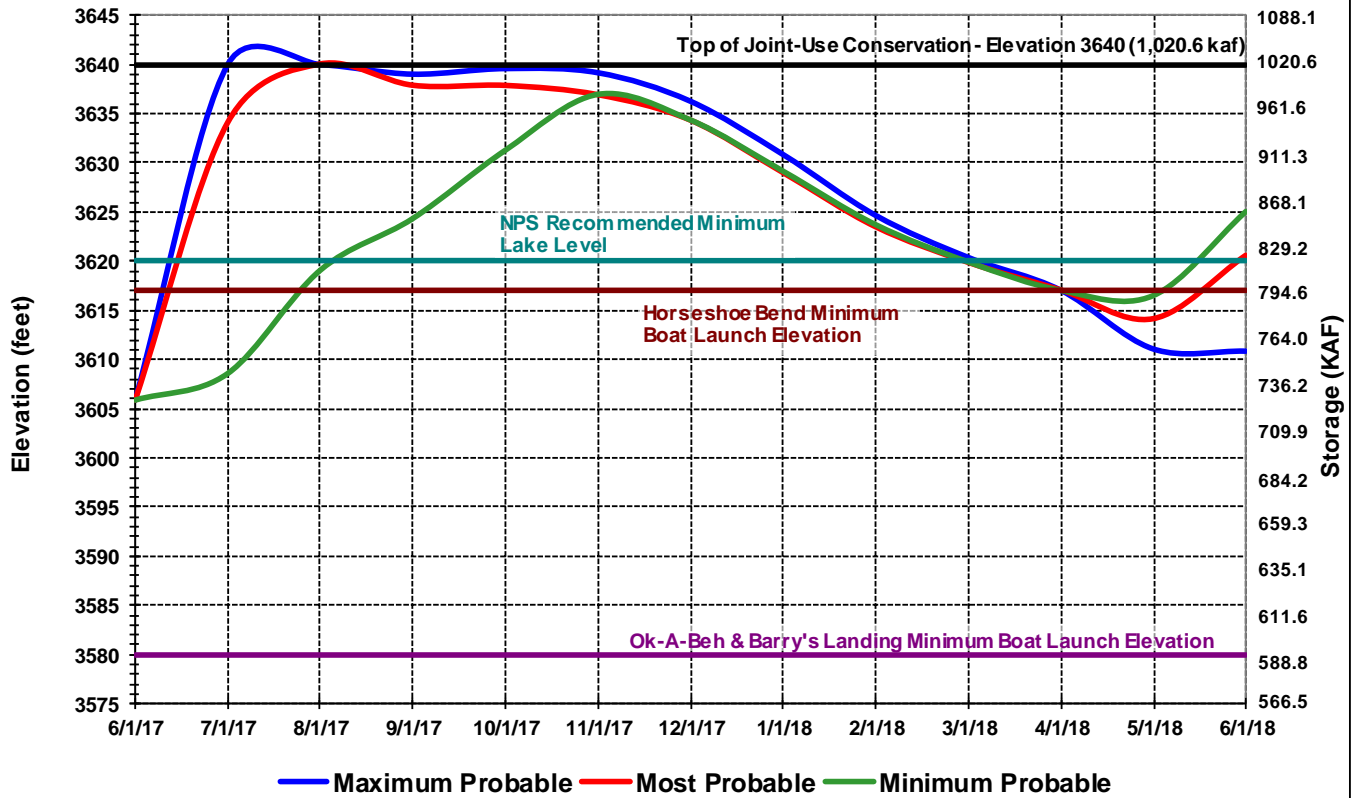
Based on Maximum Probable Inflow Forecast (June-July Inflow: 1,582.3 KAF)

BIGHORN LAKE MONTHLY OPERATIONS

Bighorn Reservoir		Initial Cont	740.4 kaf	Maximum Cont	1278.9 kaf	Minimum Cont	469.9 kaf								
		Elev	3605.78 ft	Elev	3657.00 ft	Elev	3547.00 ft								
		2017	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Boysen Release	kaf	446.3	252.3	131.0	88.4	67.6	59.5	61.5	61.5	55.5	61.5	130.9	141.0	1557.0	
Boysen Release	cfs	7500	4103	2131	1486	1099	1000	1000	1000	999	1000	2200	2293		
Buffalo Bill Release	kaf	365.9	232.2	156.3	101.1	50.8	21.1	21.8	21.8	19.8	21.8	45.6	127.3	1185.5	
Buffalo Bill Release	cfs	6149	3776	2542	1699	826	355	355	355	357	355	766	2070		
Station Gain	kaf	285.5	0.1	-30.8	39.3	90.3	67.9	49.4	51.8	62.2	82.2	51.0	300.0	1048.9	
Monthly Inflow	kaf	1097.7	484.6	256.5	228.8	208.7	148.5	132.7	135.1	137.5	165.5	227.5	568.3	3791.4	
Monthly Inflow	cfs	18447	7881	4172	3845	3394	2496	2158	2197	2476	2692	3823	9243		
Turbine Release	kaf	357.0	368.9	268.7	221.6	213.9	183.1	189.3	189.2	170.9	189.3	265.5	368.9	2986.3	
Bypass/Spill/Waste	kaf	460.5	115.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200.8	777.0	
Total Release	kaf	817.5	484.6	268.7	221.6	213.9	183.1	189.3	189.2	170.9	189.3	265.5	569.7	3763.3	
Total Release	cfs	13739	7881	4370	3724	3479	3077	3079	3077	3077	3079	4462	9265		
Spring Flow	kaf	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	3.9	4.3	4.2	4.3	50.8	
Irrigation Reqmnt	kaf	22.8	28.1	27.0	17.5	3.0	0.0	0.0	0.0	0.0	0.0	1.3	11.9	111.6	
Afterbay Rels	kaf	821.7	488.9	273.0	225.8	218.2	187.3	193.6	193.5	174.8	193.6	269.7	574.0	3814.1	
Afterbay Rels	cfs	13809	7951	4440	3795	3549	3148	3149	3147	3147	3149	4532	9335		
River Release	kaf	798.9	460.8	246.0	208.3	215.2	187.3	193.6	193.5	174.8	193.6	268.4	562.1	3702.5	
River Release	cfs	13426	7494	4001	3501	3500	3148	3149	3147	3147	3149	4511	9142		
Min Release	kaf	779.5	92.2	246.0	208.3	215.2	89.3	92.2	92.2	83.3	92.2	89.3	92.2	2171.9	
End-Month Content	kaf	1020.6	1020.6	1008.4	1015.6	1010.4	975.8	919.2	865.1	831.7	807.9	769.9	768.5		
End-Month Elevation	ft	3640.00	3640.00	3639.02	3639.60	3639.18	3636.26	3630.84	3624.63	3620.33	3617.00	3611.01	3610.77		
Net Change Content	kaf	280.2	0.0	-12.2	7.2	-5.2	-34.6	-56.6	-54.1	-33.4	-23.8	-38.0	-1.4	28.1	
Yellowtail Power	2017	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total	
Turbine Release	kaf	357.0	368.9	268.7	221.6	213.9	183.1	189.3	189.2	170.9	189.3	265.5	368.9	2986.3	
Generation	gwh	145.800	150.660	110.625	90.351	86.839	72.470	74.370	73.295	64.594	72.072	102.560	150.660	1194.296	
End-Month Power Cap	mw	287.5	287.5	286.6	287.1	286.7	284.0	278.8	272.9	268.8	265.7	260.0	259.8		
% Max Gen		70	70	52	44	41	35	35	34	33	34	49	70		
Ave kwh/af		408	408	412	408	406	396	393	387	378	381	386	408	400	
Upstream Generation	gwh	33.047	35.271	35.014	28.478	18.965	10.860	11.185	11.115	9.153	11.037	22.441	34.050	260.616	
Total Generation	gwh	178.847	185.931	145.639	118.829	105.804	83.330	85.555	84.410	73.747	83.109	125.001	184.710	1454.912	

BIGHORN LAKE

BIGHORN LAKE ELEVATION



BIGHORN RIVER FLOW BELOW AFTERBAY

