

**WESTERN AREA POWER ADMINISTRATION  
HYDRO CONDITIONS AND PURCHASE POWER REPORT  
July 2019**

	Generation (Megawatt-Hours [MWh])				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Projected	Most	Average	Actual	Actual	Projected	Most	Actual
	Dry	Probable				Dry	Probable	
<b>Oct 18</b>	2,191,197	2,291,715	1,776,615	2,166,211	221,956	\$4,702,090	\$4,374,513	\$6,027,880
<b>Nov 18</b>	1,947,604	2,049,917	1,675,280	1,967,804	308,667	\$7,950,056	\$7,668,841	\$9,087,517
<b>Dec 18</b>	1,646,222	1,613,363	1,704,693	1,526,996	460,159	\$10,394,950	\$11,615,895	\$11,782,322
<b>Jan 19</b>	1,676,465	1,704,113	1,861,169	1,623,543	343,552	\$9,616,011	\$8,795,704	\$9,344,396
<b>Feb 19</b>	1,597,167	1,607,587	1,690,559	1,596,912	324,181	\$7,909,927	\$6,371,208	\$11,012,653
<b>Mar 19</b>	1,971,097	1,730,792	1,957,827	1,936,390	438,263	\$8,153,711	\$6,680,118	\$14,095,317
<b>Apr 19</b>	2,423,249	2,460,532	2,249,272	2,479,470	108,980	\$3,640,422	\$1,903,748	\$2,733,761
<b>May 19</b>	2,972,853	3,088,102	2,609,363	2,697,984	46,678	\$2,349,096	\$1,113,563	\$839,262
<b>Jun 19</b>	3,192,285	3,299,121	2,722,229	3,105,466				
<b>Jul 19</b>								
<b>Aug 19</b>								
<b>Sep 19</b>								
<b>Total</b>	19,618,141	19,845,242	18,247,006	19,100,777	2,252,436	\$54,716,264	\$48,523,589	\$64,923,108

Actual generation as a percentage of average: 104.7%

Cost per MWh: \$28.82

Western Area Power Administration (WAPA) generated 19,101 gigawatt-hours (GWh) during October through June of fiscal year 2019, or 104.7 percent of the average. Actual purchase power data is currently available from October through May for all of WAPA's Regions, and during this period, total purchase power was 2,252 GWh and total purchase power expenses were \$64,923,108, which equates to \$28.82 per MWh.

The following pages indicate WAPA's Regional snowpack, lake/reservoir inflow and storage, generation, and purchase power expenses. Snowpack reports as snow water equivalent, which is the depth of water that theoretically would result if the entire snowpack melts instantaneously.

WAPA's Regions use the monthly purchase power numbers indicated herein as a forecasting tool, and therefore they do not reflect energy imbalance transactions and other such information that is not forecastable. Furthermore, no verification of the purchase power numbers for financial auditing purposes has occurred. Consequently, these numbers will vary from those reported in WAPA's year-end financial statements that are the definitive source for WAPA's purchase power data.



## Colorado River Storage Project

	Snowpack (Inches in Snow Water Equivalent)		Lake/Reservoir Inflow (Thousand Acre-Feet)		Lake/Reservoir Content (Million Acre-Feet)		Generation (MWh)				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Median	Actual	Average	Actual	Average	Actual	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 18	1.30	1.50	514.42	351.00	15.01	10.86	321,546	322,388	382,430	350,253	85,231	\$2,864,090	\$2,837,493	\$2,445,254
Nov 18	4.80	5.20	474.23	254.00	14.91	10.51	303,372	316,406	388,155	298,876	162,992	\$3,956,202	\$3,856,748	\$5,385,266
Dec 18	8.10	7.60	362.96	228.00	14.86	10.10	355,598	375,353	437,962	376,666	115,368	\$4,457,663	\$5,908,583	\$4,564,811
Jan 19	11.50	12.10	361.45	212.00	14.98	9.63	348,335	396,430	457,394	397,561	104,938	\$4,673,912	\$4,072,956	\$3,614,778
Feb 19	15.10	17.50	392.01	255.00	15.99	9.26	310,650	369,961	390,580	362,157	81,474	\$3,566,014	\$2,230,770	\$3,846,903
Mar 19	18.90	24.50	666.27	624.00	16.77	9.05	330,574	345,266	390,170	369,565	87,114	\$2,714,461	\$86,268	\$2,817,982
Apr 19	19.40	23.40	1,057.14	1,244.00	16.74	9.20	320,609	334,927	397,861	360,975	46,344	\$1,315,218	\$44,534	\$958,598
May 19	7.90	20.80	2,337.68	2,511.00	16.30	10.30	353,950	504,794	475,860	451,987	9,376	\$1,241,595	\$6,062	\$165,993
Jun 19	0.00	2.90	2,668.50	4,206.00	16.00	12.91	349,453	645,461	534,248	570,597	1,631	\$2,868,517	\$0	\$21,418
Jul 19														
Aug 19														
Sep 19														
<b>Total</b>							2,994,088	3,610,986	3,854,659	3,538,637	694,468	\$27,657,671	\$19,043,415	\$23,821,003

Actual generation as a percentage of average: 91.8%

Cost per MWh: \$34.30

### Lake/Reservoir Levels

Lake Powell's elevation was 3,612 feet at the end of June, about 88 feet below the maximum reservoir level and about 122 feet above the minimum generation level. The storage volume for Lake Powell was 12.91 million acre-feet at the end of June, or about 53 percent of capacity.

### Weather and Other Conditions

Inflows into Lake Powell are now projected to be 128 percent of average. As a result of above-average inflows, Lake Powell is expected to end water year 2019 with about 3.1 million acre-feet more storage and about 32 feet higher elevation compared to the end of water year 2018.



## Desert Southwest Region

	Snowpack (Inches in Snow Water Equivalent)		Lake/Reservoir Inflow (Thousand Acre-Feet)		Lake/Reservoir Content (Million Acre-Feet)		Generation (MWh)				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Median	Actual	Average	Actual	Average	Actual	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 18	1.30	1.50	93.71	101.00	20.03	12.01	351,400	351,315	377,868	339,511	11,000	\$308,000	\$400,000	\$409,640
Nov 18	4.80	5.20	54.08	68.00	20.08	12.03	367,050	357,160	363,617	357,474	11,001	\$435,640	\$435,640	\$435,640
Dec 18	8.10	7.60	72.32	52.00	20.21	12.32	247,750	244,540	369,749	233,300	30,582	\$1,258,177	\$1,258,177	\$1,549,896
Jan 19	11.50	12.10	93.81	105.00	20.37	12.72	265,650	248,555	392,324	248,683	24,471	\$844,099	\$844,099	\$1,240,190
Feb 19	15.10	17.50	109.59	127.00	20.40	12.96	389,500	330,335	389,146	327,946	25,248	\$744,930	\$744,930	\$1,737,820
Mar 19	18.90	24.50	104.25	202.00	20.21	13.14	532,700	418,160	529,401	412,674	31,605	\$1,262,021	\$1,262,021	\$1,404,210
Apr 19	19.40	23.40	84.70	117.00	20.03	13.02	528,100	515,415	570,854	502,066	8,134	\$349,070	\$349,070	\$216,711
May 19	7.90	20.80	59.61	107.00	20.13	12.86	570,400	542,410	571,052	542,012	7,054	\$622,861	\$622,861	\$229,480
Jun 19	0.00	2.90	27.36	70.00	20.32	12.69	500,200	499,765	536,860	497,829	13,585	\$639,986	\$639,986	\$560,381
Jul 19														
Aug 19														
Sep 19														
<b>Total</b>							3,752,750	3,507,655	4,100,871	3,461,493	162,680	\$6,464,784	\$6,556,784	\$7,783,968

Actual generation as a percentage of average: 84.4%

Cost per MWh: \$47.85

### Lake/Reservoir Levels

Lake Mead's elevation was 1,085 feet at the end of June, about 135 feet below the full storage level and about 135 feet above the minimum generation level. For water year 2019, Lake Mead's elevation dropped to a minimum of 1,078 feet in November and rose to a peak of 1,090 feet in March.

### Weather and Other Conditions

The Desert Southwest Region's (DSWR) hydrology is mostly dependent on the Colorado River Basin snowpack and precipitation above Lake Powell. The precipitation is currently 123 percent of average and the snowpack is negligible.

*Note: DSWR's projected dry and most probable generation data are reported from studies conducted by the U.S. Bureau of Reclamation.*



## Rocky Mountain Region

	Snowpack (Inches in Snow Water Equivalent)		Lake/Reservoir Inflow (Thousand Acre-Feet)		Lake/Reservoir Content (Million Acre-Feet)		Generation (MWh)				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Median	Actual	Average	Actual	Average	Actual	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
	Oct 18	0.00	0.00	145.00	123.30	3.87	4.16	126,310	140,345	96,983	105,818	70,588	\$1,010,520	\$617,540
Nov 18	3.80	3.00	121.90	114.40	3.83	4.15	53,631	59,591	109,895	64,731	81,577	\$3,039,932	\$2,873,052	\$2,144,120
Dec 18	11.70	14.60	100.60	98.60	3.79	4.10	88,802	98,669	123,353	93,787	68,757	\$2,472,344	\$2,196,068	\$2,910
Jan 19	28.20	29.90	97.10	98.10	3.77	4.23	114,996	127,774	121,795	122,360	38,467	\$1,612,912	\$1,255,128	\$696,522
Feb 19	39.40	35.90	95.50	92.10	3.70	4.01	108,334	120,372	111,291	112,571	10,758	\$802,648	\$465,584	\$273,355
Mar 19	35.90	39.40	158.60	149.70	3.84	4.03	110,289	122,544	128,512	107,241	32,285	\$1,092,308	\$749,168	\$1,034,349
Apr 19	44.90	52.30	246.70	344.50	3.88	4.21	159,352	177,058	144,007	178,116	3,408	\$477,344	\$0	\$84,014
May 19	43.40	47.10	737.90	674.70	4.42	5.10	231,213	256,904	196,456	216,137	509	\$0	\$0	\$15,442
Jun 19	17.10	37.20	1,149.50	1,251.30	4.91	5.44	236,362	262,625	246,058	270,954	0	\$0	\$0	\$0
Jul 19														
Aug 19														
Sep 19														
<b>Total</b>							1,229,289	1,365,882	1,278,349	1,271,715	306,349	\$10,508,008	\$8,156,540	\$6,280,750

Actual generation as a percentage of average: 99.5%

Cost per MWh: \$20.50

### Lake/Reservoir Content

Reservoir inflows are 109 percent of average for all of the Loveland Area Projects (LAP).

### Weather and Other Conditions

The snowpack numbers are decreasing and there is not much left to melt. The latest National Weather Service forecast indicates August through October temperatures are more likely to be above normal and the precipitation is likely to be above normal in the LAP area. For LAP as a whole, August generation is expected to stay close to the marketed amount. Summer generation in the Colorado and North Platte River Basins is forecasted to be average. August generation in the Bighorn River Basin will be slightly above average due to storage in Bighorn Lake being held in the exclusive flood pool to mitigate Missouri River flooding in July, so releases will remain a little higher than average for August until elevations decrease back to the normal operating zone.

*Note: The Rocky Mountain Region's (RMR) most recent reported actual generation and purchase power data are provisional values.*



## Sierra Nevada Region

	Snowpack (Inches in Snow Water Equivalent)		Lake/Reservoir Inflow (Thousand Acre-Feet)		Lake/Reservoir Content (Million Acre-Feet)		Generation (MWh)				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Median	Actual	Average	Actual	Average	Actual	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 18	N/A	N/A	337.00	267.00	5.33	5.81	66,000	71,000	163,000	122,451	54,606	\$519,480	\$519,480	\$1,136,470
Nov 18	26.67	4.00	413.00	329.00	5.30	5.72	14,000	0	104,000	73,243	50,948	\$499,500	\$499,500	\$1,039,392
Dec 18	28.00	7.00	934.00	489.00	5.69	5.83	39,000	0	143,000	5,086	64,085	\$499,500	\$499,500	\$1,342,138
Jan 19	28.69	17.50	1,120.00	1,349.00	6.11	6.89	0	0	163,000	0	66,444	\$528,840	\$528,840	\$987,373
Feb 19	27.82	37.00	1,321.00	2,148.00	6.67	8.22	0	9,000	195,000	37,424	58,503	\$488,160	\$488,160	\$761,853
Mar 19	28.57	46.00	1,646.00	2,592.00	7.28	8.62	208,000	138,000	207,000	536,195	15,116	\$488,160	\$488,160	\$369,408
Apr 19	27.43	31.00	1,481.00	2,637.00	7.96	9.27	353,000	423,000	288,000	585,381	12,324	\$466,000	\$466,000	\$369,408
May 19	26.15	17.00	1,305.00	1,933.00	7.99	9.85	511,000	501,000	442,000	388,517	29,266	\$484,640	\$484,640	\$399,176
Jun 19	N/A	N/A	832.00	1,429.00	7.62	9.81	460,000	485,000	440,000	467,574	27,173	\$484,640	\$484,640	\$412,652
Jul 19														
Aug 19														
Sep 19														
<b>Total</b>							1,651,000	1,627,000	2,145,000	2,215,872	378,464	\$4,458,920	\$4,458,920	\$6,817,870

Actual generation as a percentage of average: 103.3%

Cost per MWh: \$18.01

### Lake/Reservoir Content

As of June 30, reservoir storage for the water year was 129 percent of the 15-year average for Trinity, 124 percent for Shasta, 120 percent for Folsom, and 142 percent for New Melones. Accumulated inflow for the same date was 135 percent of the 15-year average for Trinity, 137 percent for Shasta, 143 percent for Folsom, and 153 percent for New Melones.

### Weather and Other Conditions

May precipitation was 310 percent of its monthly average, but June precipitation was only 47 percent of average. The Sacramento River Index forecast for 50 percent exceedence is "wet" and the 90 percent exceedence is also "wet."

*Note: Sierra Nevada Region's (SNR) bases average generation upon long-term modeling done for its "Green Book." SNR does not project purchase power expenses for dry conditions, and its most probable expenses are based upon term purchases of 35 to 65 percent of projected power needs, with the difference being left to day-ahead markets after project pumping and generation have been scheduled.*



## Upper Great Plains Region

	Snowpack (Inches in Snow Water Equivalent)		Lake/Reservoir Inflow (Thousand Acre-Feet)		Lake/Reservoir Content (Million Acre-Feet)		Generation (MWh)				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Median	Actual	Average	Actual	Average	Actual	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 18	1.20	0.60	7,972.00	12,743.92	56.14	61.29	1,325,941	1,406,667	756,334	1,248,178	531	\$0	\$0	\$6,478
Nov 18	3.80	3.49	7,334.00	12,156.48	55.06	58.80	1,209,552	1,316,760	709,613	1,173,480	2,149	\$18,782	\$3,900	\$83,100
Dec 18	7.10	5.70	6,422.00	7,619.10	54.46	58.43	915,072	894,801	630,628	818,157	181,367	\$1,707,266	\$1,753,567	\$4,322,567
Jan 19	10.30	8.70	6,641.00	7,118.20	54.18	57.59	947,484	931,354	726,656	854,939	109,232	\$1,956,248	\$2,094,681	\$2,805,533
Feb 19	13.10	14.10	6,281.00	6,737.50	54.50	57.52	788,683	777,919	604,543	756,814	148,198	\$2,308,176	\$2,441,763	\$4,392,721
Mar 19	15.80	15.30	8,151.00	12,477.60	56.20	64.04	789,534	706,822	702,744	510,715	272,143	\$2,596,762	\$4,094,500	\$8,469,368
Apr 19	14.90	15.00	8,041.00	13,424.98	57.06	66.22	1,062,188	1,010,132	848,551	852,932	38,770	\$1,032,790	\$1,044,144	\$1,105,030
May 19	6.30	7.20	9,654.00	16,590.74	58.35	69.02	1,306,290	1,282,994	923,995	1,099,332	473	\$0	\$0	\$29,171
Jun 19	0.50	1.00	11,746.00	17,798.80	60.54	69.89	1,646,270	1,406,270	965,062	1,298,513	*	\$0	\$0	*
Jul 19														
Aug 19														
Sep 19														
<b>Total</b>							9,991,014	9,733,719	6,868,127	8,613,060	752,863	\$9,620,024	\$11,432,556	\$21,213,968

Actual generation as a percentage of average: 125.4%

Cost per MWh: \$28.18

### Lake/Reservoir Content

As of July 19, the active conservation pools for the Canyon Ferry and Yellowtail Dams were both 100.0 percent full.

### Weather and Other Conditions

The June runoff was 159 percent of normal. The U.S. Drought Monitor shows a small northern area of the upper Missouri River Basin is impacted by abnormally dry conditions, with a small portion in moderate to severe drought. The Midwest/High Plains had isolated areas of moderate rainfall but conditions remained essentially unchanged, with the exception of some additional areas of moderate drought in the southwestern areas of the region but not yet severe enough to constitute an “abnormally dry” classification for the area.

*Note: The Upper Great Plains Region reports its 50 percent share of generation from Yellowtail Dam, and RMR reports the snowpack, inflow, content, and remaining share of generation. Asterisks indicate that actual purchase power data is not available for the month.*

