WESTERN AREA POWER ADMINSTRATION
HYDRO CONDITIONS AND PURCHASE POWER REPORT
April 2019

	Generation (Megawatt-Hours [MWh])				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 18	2,191,197	2,291,715	1,776,615	2,166,211	176,303	$4,702,090	$4,374,513	$4,416,679
Nov 18	1,947,604	2,049,917	1,675,280	1,967,804	246,705	$7,950,056	$7,668,841	$7,248,117
Dec 18	1,646,222	1,613,363	1,704,693	1,526,996	415,349	$10,394,950	$11,615,895	$12,152,385
Jan 19	1,676,465	1,704,113	1,861,169	1,623,543	351,362	$9,616,011	$8,795,704	$9,409,872
Feb 19	1,597,167	1,607,587	1,690,559	1,620,346	353,525	$7,909,927	$6,371,208	$11,547,199
Mar 19	1,971,097	1,730,792	1,957,827	2,033,011				
Apr 19								
May 19								
Jun 19								
Jul 19								
Aug 19								
Sep 19								
Total	11,029,753	10,997,486	10,666,142	10,937,911	1,543,244	$40,573,034	$38,826,160	$44,774,251
Actual generation as a percentage of average:				102.5%			Cost per MWh:	$29.01

Western Area Power Administration (WAPA) generated 10,938 gigawatt-hours (GWh) during October through March of fiscal year 2019, or 102.5 percent of the average. Actual purchase power data is currently available from October through February for all of WAPA's Regions, and during this period, total purchase power was 1,543 GWh and total purchase power expenses were $44,774,251, which equates to $29.01 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 should be 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	390,170	87,114	$2,714,461	$86,268	$2,817,982
Apr 19														
May 19														
Jun 19														
Jul 19														
Aug 19														
Sep 19														
Total							1,970,075	2,125,804	2,446,691	2,175,683	637,117	$22,232,341	$18,992,819	$22,674,994
							Actual generation as a percentage of average:			88.9%			Cost per MWh:	$35.59

Lake/Reservoir Levels

Lake Powell's elevation was 3,569 feet at the end of March, about 131 feet below the maximum reservoir level and about 79 feet above the minimum generation level. The storage volume for Lake Powell was 9.05 million acre-feet at the end of March, or about 38 percent of capacity.

Weather and Other Conditions

Inflows into Lake Powell are now projected to be 128 percent of average. Consequently, Lake Powell is expected to end water year 2019 with almost 2 million acre-feet more storage than at the end of water year 2018.

Note: The Colorado River Storage Project's actual generation data was not available for the month of March, so the average value is reported instead and this will be corrected next month.

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														
May 19														
Jun 19														
Jul 19														
Aug 19														
Sep 19														
Total							2,154,050	1,950,065	2,422,105	1,919,587	133,907	$4,852,867	$4,944,867	$6,777,396
							Actual generation as a percentage of average:			79.3%			Cost per MWh:	$50.61

Lake/Reservoir Levels

Lake Mead's elevation was 1,090 feet at the end of March, about 129 feet below the full storage level and about 140 feet above the minimum generation level. Lake Mead's elevation peaked at 1,090 feet in March and is projected to drop to a minimum elevation of 1,081 feet in July.

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 115 percent of average and the snowpack is 121 percent of median.

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	24,935	$1,010,520	$617,540	$418,837
Nov 18	3.80	3.00	121.90	114.40	3.83	4.15	53,631	59,591	109,895	64,731	19,615	$3,039,932	$2,873,052	$304,719
Dec 18	11.70	14.60	100.60	98.60	3.79	4.10	88,802	98,669	123,353	93,787	23,948	$2,472,344	$2,196,068	$372,973
Jan 19	28.20	29.90	97.10	98.10	3.77	4.23	114,996	127,774	121,795	122,360	46,277	$1,612,912	$1,255,128	$761,998
Feb 19	39.40	35.90	95.50	92.10	3.70	4.01	108,334	120,372	111,291	136,005	40,102	$802,648	$465,584	$807,901
Mar 19	44.90	52.30	158.60	149.70	3.84	4.03	110,289	122,544	128,512	183,257	40,055	$1,092,308	$749,168	$1,259,871
Apr 19														
May 19														
Jun 19														
Jul 19														
Aug 19														
Sep 19														
Total							602,362	669,295	691,828	705,958	194,932	$10,030,664	$8,156,540	$3,926,299
							Actual generation as a percentage of average:			102.0%			Cost per MWh:	$20.14

Lake/Reservoir Content

Reservoir inflows have been about average so far this water year for all of Loveland Area Projects (LAP) area.

Weather and Other Conditions

Hydrologic conditions for the LAP area can vary from one river basin and watershed to another. LAP is currently drought free. The snowpack is just above average in the Colorado River Basin and right at average in the Bighorn and North Platte River Basins. The latest National Weather Service forecast indicates May through July temperatures will have an equal chance of being below or above average in Colorado and Wyoming, and the precipitation forecast indicates May through July will be above average for all of the LAP area. Generation is forecasted to remain average for all of LAP this spring season.

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														
May 19														
Jun 19														
Jul 19														
Aug 19														
Sep 19														
Total							327,000	218,000	975,000	774,400	309,701	$3,023,640	$3,023,640	$5,636,634
									Actual generation as a percentage of average:	79.4%			Cost per MWh:	$18.20

Lake/Reservoir Content

As of March 31, reservoir storage for the water year was 111 percent of the 15-year average for Trinity, 112 percent for Shasta, 115 percent for Folsom, and 129 percent for New Melones. Accumulated inflow for the same date was 100 percent of the 15-year average for Trinity, 126 percent for Shasta, 128 percent for Folsom, and 129 percent for New Melones.

Weather and Other Conditions

March precipitation was 141 percent of its monthly average and the current cumulative precipitation is 115 percent of the annual average. The snowpack in California is presumed to reach its peak on April 1, and as of March 31 the snowpack was at 161 percent of the average peak amount. 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	*	$1,596,762	$2,094,500	*
Apr 19														
May 19														
Jun 19														
Jul 19														
Aug 19														
Sep 19														
Total							5,976,266	6,034,323	4,130,518	5,362,283	441,477	$7,587,234	$8,388,412	$11,610,399
							Actual generation as a percentage of average:			129.8%			Cost per MWh:	$26.30

Lake/Reservoir Content

As of April 21, the active conservation pools for the Canyon Ferry and Yellowtail Dams were 77.9 percent and 78.0 percent full, respectively.

Weather and Other Conditions

The March runoff was 375 percent of normal. Runoff was above average at Fort Peck, Fort Randall, Garrison, Gavins Point, and Oahe. Snowpack reports show 102 percent of average above Fort Peck and 99 percent of average in the Fort Peck to Garrison reach. The U.S. Drought Monitor shows that none of the upper Missouri River Basin is impacted by drought. Every state in the Midwest received above-average precipitation during December through February, leaving the area with deep snowpack and overall wet conditions. The three-month weather forecast indicates above-normal temperatures and normal precipitation.

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.