

**WESTERN AREA POWER ADMINISTRATION
HYDRO CONDITIONS AND PURCHASE POWER REPORT
MAY 2016**

Agency-wide

	Generation (Megawatt-Hours [MWh])				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Projected <u>Dry</u>	Most <u>Probable</u>	<u>Average</u>	<u>Actual</u>	<u>Actual</u>	Projected <u>Dry</u>	Most <u>Probable</u>	<u>Actual</u>
Oct 15	1,434,895	1,538,279	1,966,014	1,612,157	265,079	\$13,412,993	\$10,002,458	\$7,273,130
Nov 15	1,378,403	1,448,916	1,852,469	1,385,316	416,430	\$16,197,285	\$14,195,619	\$9,530,629
Dec 15	1,325,629	1,506,717	1,755,293	1,497,975	492,619	\$19,371,552	\$13,648,145	\$10,145,106
Jan 16	1,709,435	1,760,027	1,882,890	1,735,645	273,084	\$9,493,892	\$5,902,813	\$6,561,179
Feb 16	1,365,511	1,491,899	1,746,941	1,516,513	379,479	\$12,320,267	\$8,662,264	\$7,673,322
Mar 16	1,696,021	1,715,754	1,987,844	1,769,248	360,003	\$9,989,905	\$8,226,674	\$6,897,196
Apr 16	1,811,037	1,901,810	2,228,272	1,872,005				
May 16								
Jun 16								
Jul 16								
Aug 16								
Sep 16								
Total	10,720,931	11,363,400	13,419,723	11,388,858	2,186,693	\$80,785,895	\$60,637,973	\$48,080,562
	Actual generation as a percentage of average: 84.9%					Cost per MWh: \$21.99		

Western Area Power Administration (WAPA) generated a total of 11,389 gigawatt-hours (GWh) during October through April of fiscal year 2016, or 84.9 percent of the average. Actual purchase power data is currently available from October through March for all of WAPA's Regions, and during this period total purchase power was 2,187 GWh and total purchase power expenses were \$48,080,562, which equates to \$21.99 per MWh.

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

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 15	0.20	0.80	514.42	535.00	15.01	12.29	248,012	340,194	382,430	379,732	71,798	\$6,704,081	\$2,989,589	\$2,100,360
Nov 15	1.80	3.90	474.23	421.00	14.91	11.93	230,952	316,064	388,155	340,308	106,233	\$7,549,826	\$4,237,967	\$2,748,918
Dec 15	4.00	7.90	362.96	294.00	14.86	11.54	270,310	443,456	437,962	472,018	38,014	\$7,692,571	\$1,952,432	\$1,129,176
Jan 16	11.50	11.20	361.45	300.00	14.98	11.33	355,138	441,000	457,394	481,075	35,898	\$4,412,679	\$619,112	\$1,067,937
Feb 16	15.10	13.40	392.01	396.00	15.99	11.22	265,647	347,936	390,580	400,465	51,902	\$5,024,221	\$1,432,878	\$1,531,914
Mar 16	18.90	17.10	666.27	553.00	16.77	11.02	272,465	293,073	390,170	355,405	110,494	\$5,517,603	\$2,975,893	\$2,915,399
Apr 16	19.40	17.50	1,057.14	814.00	16.74	11.01	250,695	277,986	397,861	382,353	33,650	\$3,468,325	\$1,850,278	\$606,969
May 16														
Jun 16														
Jul 16														
Aug 16														
Sep 16														
Total							1,893,220	2,459,709	2,844,551	2,811,356	447,989	\$40,369,305	\$16,058,149	\$12,100,673

Actual generation as a percentage of average: 98.8%

Cost per MWh: \$27.01

Lake/Reservoir Levels

Lake Powell's elevation was 3,592 feet at the end of April, about 108 feet below the maximum reservoir level and about 102 feet above the minimum generation level. Current storage volume for Lake Powell is 11,105,000 acre-feet, which is about 45 percent of capacity.

Weather and Other Conditions

No unusual conditions reported.



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 15	0.20	0.80	59.90	119.00	20.40	12.01	339,700	319,060	379,926	319,537	1,105	\$0	\$36,896	\$36,896
Nov 15	1.80	3.90	53.51	41.00	20.44	11.95	312,250	338,035	363,256	330,812	136	\$25,378	\$131,780	\$4,408
Dec 15	4.00	7.90	73.77	42.00	20.57	12.23	288,100	310,990	373,314	318,054	1,795	\$243,930	\$165,592	\$60,635
Jan 16	11.50	11.20	93.00	90.00	20.71	12.52	359,550	343,440	397,807	341,451	995	\$0	\$120,478	\$34,984
Feb 16	15.10	13.40	109.40	81.00	20.74	12.56	334,500	386,660	391,662	382,329	305	\$0	\$0	\$10,623
Mar 16	18.90	17.10	102.88	31.00	20.54	12.32	546,500	546,625	531,952	545,047	1,466	\$72,029	\$0	\$50,284
Apr 16	19.40	17.50	84.78	69.00	20.36	12.04	566,300	575,135	572,023	563,595	1,741	\$0	\$0	\$59,386
May 16														
Jun 16														
Jul 16														
Aug 16														
Sep 16														
Total							2,746,900	2,819,945	3,009,940	2,800,825	7,543	\$341,337	\$454,746	\$257,216

Actual generation as a percentage of average: 93.1%

Cost per MWh: \$34.10

Lake/Reservoir Levels

Lake Mead's elevation was 1,076 feet at the end of April, about 143 feet below full storage level and about 26 feet above the minimum generation level.

Weather and Other Conditions

The Desert Southwest Region's hydrology is mostly dependent on the Colorado River Basin snowpack and precipitation above Lake Powell. The water year 2016 precipitation is currently 101 percent of average.

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 15			138.60	117.70	3.85	4.44	86,700	86,400	84,083	86,111	77,092	\$2,329,286	\$2,339,186	\$2,077,078
Nov 15			120.30	107.00	3.85	4.44	65,000	65,300	81,138	65,774	78,992	\$3,053,655	\$3,043,755	\$1,996,381
Dec 15	246.40	205.10	98.80	98.40	3.82	4.42	105,900	106,200	103,195	107,384	64,146	\$2,202,853	\$2,192,953	\$1,620,872
Jan 16	417.90	393.40	96.20	101.70	3.80	4.41	127,800	128,400	113,267	126,958	28,770	\$1,476,948	\$1,463,748	\$697,853
Feb 16	849.60	818.20	95.00	110.00	3.80	4.44	118,200	120,600	101,392	113,311	22,942	\$620,631	\$544,731	\$593,731
Mar 16	1,065.10	1,012.90	158.40	145.20	3.83	4.49	134,300	155,500	120,394	117,455	20,003	\$493,482	\$0	\$432,138
Apr 16	1,341.70	1,422.60	253.10	339.90	3.85	4.71	140,800	169,700	140,578	119,364	60,407	\$1,174,107	\$217,107	\$959,741
May 16														
Jun 16														
Jul 16														
Aug 16														
Sep 16														
Total							778,700	832,100	744,047	736,357	352,352	\$11,350,962	\$9,801,480	\$8,377,794

Actual generation as a percentage of average: 99.0%

Cost per MWh: \$23.78

Lake/Reservoir Content

The overall reservoir content at the end of April was 122 percent of average.

Weather and Other Conditions

The Loveland Area Projects (LAP) area is drought free except for a small part of the Bighorn Basin. The snowpack is above average for the Colorado-Big Thompson Project and North Platte Basin, and has improved but is still below average in the Bighorn Basin. The latest National Weather Service forecast indicates June through August temperatures and precipitation are both more likely to be above normal in the LAP area. The spring snow melt runoff is forecast to be above average in all three basins.

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

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 15			316.00	204.00	5.29	2.34	91,000	136,000	163,000	128,332	56,293	\$1,820,820	\$1,820,820	\$1,871,992
Nov 15	3.57	2.00	386.00	210.00	5.24	2.21	79,000	99,000	104,000	38,675	57,583	\$1,727,548	\$1,727,548	\$1,877,190
Dec 15	9.43	10.00	1,017.00	553.00	5.76	2.47	64,000	54,000	143,000	47,723	61,018	\$1,803,740	\$1,803,740	\$1,949,075
Jan 16	17.70	20.00	1,032.00	1,653.00	6.18	3.96	15,000	0	163,000	6,638	63,436	\$1,393,030	\$1,393,030	\$1,846,712
Feb 16	24.71	21.00	1,017.00	1,084.00	6.72	4.69	15,000	5,000	195,000	19,879	57,780	\$1,309,570	\$1,309,570	\$1,615,090
Mar 16	27.91	24.00	1,455.00	2,955.00	7.45	6.62	30,000	75,000	207,000	162,709	47,458	\$1,399,243	\$1,399,243	\$1,560,088
Apr 16	22.03	13.00	1,272.00	1,208.00	7.86	7.18	135,000	230,000	288,000	192,803	43,336	\$659,936	\$659,936	\$889,087
May 16														
Jun 16														
Jul 16														
Aug 16														
Sep 16														
Total							429,000	599,000	1,263,000	596,758	386,904	\$10,113,887	\$10,113,887	\$11,609,234

Actual generation as a percentage of average: 47.2%

Cost per MWh: \$30.01

Lake/Reservoir Content

As of April 30, accumulated inflow for the water year was 143 percent of the 15-year average for Trinity, 116 percent for Shasta, 124 percent for Folsom and 115 percent for New Melones. Reservoir storage as of the same date was 80 percent of 15-year average for Trinity, 111 percent for Shasta, 113 percent for Folsom and 42 percent for New Melones.

Weather and Other Conditions

As of April 30, cumulative precipitation of the Northern Sierra Eight Station Index was at 116 percent of average for the date, and 109 percent of the water year average. The May 1, 2016 forecast for the 50 percent exceedence case is the basis for the official year type declaration, which is "below normal" for this water year.

Note: The Sierra Nevada Region's (SNR) average projection of generation is taken from the latest modeling using the update to its customers' "Green Book." SNR does not project purchase power expenses for dry conditions, and its most probable projected expenses are based upon term purchases of 70-75 percent of projected power needs with the difference being left to day-ahead markets after project pumping and generation are 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 15	1.20	0.40	8,092.00	5,998.12	55.94	59.52	669,483	656,625	956,575	698,445	58,791	\$2,558,807	\$2,815,967	\$1,186,804
Nov 15	3.80	2.90	7,411.00	5,642.70	54.83	58.73	691,201	630,517	915,920	609,747	173,486	\$3,840,879	\$5,054,569	\$2,903,732
Dec 15	7.10	7.00	6,468.00	5,109.00	54.23	58.41	597,319	592,071	697,821	552,796	327,646	\$7,428,458	\$7,533,428	\$5,385,348
Jan 16	10.30	9.50	6,658.00	6,634.00	53.94	57.73	851,947	847,187	751,422	779,523	143,984	\$2,211,235	\$2,306,445	\$2,913,693
Feb 16	12.90	11.50	6,291.00	6,046.50	54.25	58.30	632,165	631,703	668,307	600,529	246,550	\$5,365,845	\$5,375,085	\$3,921,964
Mar 16	15.80	15.00	8,226.00	5,636.40	56.02	58.46	712,756	645,556	738,328	588,632	180,582	\$2,507,548	\$3,851,538	\$1,939,287
Apr 16	15.10	11.00	8,061.00	6,579.20	56.91	59.23	718,242	648,989	829,810	613,890	*	\$1,502,829	\$2,887,889	*
May 16														
Jun 16														
Jul 16														
Aug 16														
Sep 16														
Total							4,873,112	4,652,646	5,558,184	4,443,562	1,131,039	\$25,415,600	\$29,824,920	\$18,250,828

Actual generation as a percentage of average: 79.9%

Cost per MWh: \$16.14

Lake/Reservoir Content

As of May 25, the active conservation pools for the Canyon Ferry and Yellowtail Dams were 93.2 percent and 83.3 percent full, respectively.

Weather and Other Conditions

The April actual system runoff was 89 percent of normal above Sioux City. Temperatures have been above normal this spring throughout the upper Midwest, and forecasts of La Nina this summer indicate the likelihood of warmer than normal conditions for the season. Snowpack peaked on April 1. As of May 1, snowpack was at 75 percent above Fort Peck and 87 percent between Fort Peck and Garrison.

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