

Western Area Power Administration Hydro Conditions and Purchase Power Report April 2016

Western-Wide

	Generation (Megawatt-Hours [MWh])				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Projected Dry	Most Probable	Average	Actual		Projected Dry	Most Probable	Actual
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	493,359	\$19,371,552	\$13,648,145	\$10,163,658
Jan 16	1,709,435	1,760,027	1,882,890	1,735,645	281,726	\$9,493,892	\$5,902,813	\$6,768,708
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				
Apr 16								
May 16								
Jun 16								
Jul 16								
Aug 16								
Sep 16								
Total	8,909,895	9,461,590	11,191,451	9,516,853	1,836,072	\$70,795,990	\$52,411,299	\$41,409,447
	Actual generation as a percentage of average: 85.0%					Cost per MWh: \$22.55		

Western Area Power Administration (Western) generated a total of 9,517 gigawatt-hours (GWh) during October through March of fiscal year 2016, or 85.0 percent of the average. Actual purchase power data is currently available from October through February for all of Western's Regions, and during this period total purchase power was 1,836 GWh and total purchase power expenses were \$41,409,447, which equates to \$22.55 per MWh.

The following pages indicate Western'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	408.80	636.00	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	510.71	420.00	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	474.22	465.00	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	363.30	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	362.24	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	391.67	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														
May 16														
Jun 16														
Jul 16														
Aug 16														
Sep 16														
Total							1,642,525	2,181,723	2,446,691	2,429,003	414,339	\$36,900,980	\$14,207,871	\$11,493,704

Actual generation as a percentage of average: 99.3%

Cost per MWh: \$27.74

Lake/Reservoir Levels

Lake Powell's elevation was 3,592 feet at the end of March, about 108 feet below the maximum reservoir level and about 102 feet above the minimum generation level. Current storage volume for Lake Powell is 11,019,000 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														
May 16														
Jun 16														
Jul 16														
Aug 16														
Sep 16														
Total							2,180,600	2,244,810	2,437,917	2,237,230	5,802	\$341,337	\$454,746	\$197,830
Actual generation as a percentage of average:										91.8%	Cost per MWh:		\$34.10	

Lake/Reservoir Levels

Lake Mead's elevation was 1,080 feet at the end of March, about 139 feet below full storage level and about 30 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 94 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
		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
		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
Oct 15		98.80	98.40	3.82	4.42	105,900	106,200	103,195	107,384	64,886	\$2,202,853	\$2,192,953	\$1,639,424
Nov 15		96.20	101.70	3.80	4.41	127,800	128,400	113,267	126,958	37,412	\$1,476,948	\$1,463,748	\$905,382
Dec 15	246.40	205.10	95.00	110.00	3.80	4.44	118,200	120,600	101,392	113,311	\$620,631	\$544,731	\$593,731
Jan 16	417.90	393.40	158.40	145.20	3.83	4.49	134,300	155,500	120,394	117,455	\$493,482	\$0	\$674,706
Feb 16	849.60	818.20											
Mar 16	1,065.10	1,012.90											
Apr 16													
May 16													
Jun 16													
Jul 16													
Aug 16													
Sep 16													
Total						637,900	662,400	603,469	616,993	322,809	\$10,176,855	\$9,584,373	\$7,886,702

Actual generation as a percentage of average: 102.2%

Cost per MWh: \$24.43

Lake/Reservoir Content

The overall reservoir content at the end of March was 117 percent of average.

Weather and Other Conditions

While the Loveland Area Projects area is mostly drought free, parts of the Bighorn Basin are now considered to be in a state of drought. The snowpack is above average for the Colorado-Big Thompson Project and near average in the North Platte and Bighorn Basins. The latest National Weather Service forecast indicates May through July temperatures are more likely to be above normal in Wyoming and just as likely to be above as below normal in Colorado. The precipitation is more likely to be above normal in both Colorado and Wyoming.

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
		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
Oct 15													
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	\$1,877,190
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	\$1,949,075
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	\$1,846,712
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	\$1,615,090
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	\$1,560,088
Apr 16													
May 16													
Jun 16													
Jul 16													
Aug 16													
Sep 16													
Total						294,000	369,000	975,000	403,956	343,568	\$9,453,951	\$9,453,951	\$10,720,147

Actual generation as a percentage of average: 41.4%

Cost per MWh: \$31.20

Lake/Reservoir Content

As of March 31, accumulated inflow for the water year was 147 percent of the 15-year average for Trinity, 124 percent for Shasta, 131 percent for Folsom, and 117 percent for New Melones. Reservoir storage as of the same date was 73 percent of the 15-year average for Trinity, 112 percent for Shasta, 109 percent for Folsom, and 42 percent for New Melones. Shasta and Folsom were in flood control.

Weather and Other Conditions

As of March 15, cumulative precipitation of the Northern Sierra Eight Station Index is at 120 percent of average for the date, and 103 percent of the water year average. The April 1, 2016 forecast is "below normal" for both the dry (90 percent) and most probable (50 percent) exceedence cases.

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	*	\$2,507,548	\$3,851,538	*
Apr 16														
May 16														
Jun 16														
Jul 16														
Aug 16														
Sep 16														
Total							4,154,870	4,003,657	4,728,374	3,829,672	950,457	\$23,912,772	\$26,937,032	\$16,311,541
Actual generation as a percentage of average:										81.0%	Cost per MWh: \$17.16			

Lake/Reservoir Content

As of April 25, the active conservation pools for the Canyon Ferry and Yellowtail Dams were 81.8 percent and 79.1 percent full, respectively.

Weather and Other Conditions

The March actual system runoff was 59 percent of normal above Sioux City. Temperatures have been above normal this spring throughout the upper Midwest, but some late spring snowfall helped increase the snowpack numbers from the month before. As of April 1, snowpack was at 97 percent above Fort Peck and 89 percent on the reach from Fort Peck to 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.