# WESTERN AREA POWER ADMINSTRATION HYDRO CONDITIONS AND PURCHASE POWER REPORT February 2018

					Purchase							
					Power							
	Gene	ration (Megav	watt-Hours [N	1Wh])	(MWh)	Purchase	Purchase Power Expenses (Dollars)					
	Projected	Most				Projected	Most					
	Dry	<u>Probable</u>	<u>Average</u>	<u>Actual</u>	<u>Actual</u>	<u>Dry</u>	<u>Probable</u>	<u>Actual</u>				
Oct 17	1,730,649	1,783,328	1,806,598	1,829,010	190,778	\$6,365,563	\$3,865,878	\$3,641,734				
Nov 17	1,660,557	1,805,533	1,648,787	1,740,440	247,472	\$6,131,948	\$5,002,523	\$5,637,764				
Dec 17	1,491,799	1,801,088	1,650,745	1,765,969	293,104	\$7,780,484	\$5,606,805	\$6,797,677				
Jan 18	1,755,692	2,211,822	1,797,023	1,797,795								
Feb 18												
Mar 18												
Apr 18												
May 18												
Jun 18												
Jul 18												
Aug 18												
Sep 18												
Total	6,638,697	7,601,771	6,903,153	7,133,215	731,355	\$20,277,996	\$14,475,205	\$16,077,175				
Actu	al generation a	is a percentag	e of average:	103.3%			Cost per MWh:	\$21.98				

Western Area Power Administration (WAPA) generated a total of 7,133 gigawatt-hours (GWh) during October through January of fiscal year 2018, or 103.3 percent of the average. Actual purchase power data is currently available from October through December for all of WAPA's Regions, and during this period total purchase power was 731 GWh and total purchase power expenses were \$16,077,175, which equates to \$21.98 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		Lake/Reservoir Inflow		Lake/Reservoir Content						Purchase Power			
	Water Equivalent)		(Thousand	Acre-Feet)	(Million A	cre-Feet)		Generatio	on (MWh)		(MWh)	Purchase F	Power Expense	s (Dollars)
							Projected	Most				Projected	Most	
	<u>Median</u>	<u>Actual</u>	<u>Average</u>	<u>Actual</u>	<u>Average</u>	<u>Actual</u>	Dry	<u>Probable</u>	<u>Average</u>	<u>Actual</u>	<u>Actual</u>	Dry	<u>Probable</u>	<u>Actual</u>
Oct 17	1.30	0.70	514.42	449.00	15.01	14.53	248,012	389,938	382,430	430,186	28,274	\$3,545,634	\$1,146,330	\$583,418
Nov 17	4.80	2.60	474.23	387.00	14.91	14.33	230,952	370,900	388,155	385,035	64,772	\$3,484,280	\$1,392,536	\$1,497,035
Dec 17	8.10	4.60	362.96	299.00	14.86	14.07	270,310	499,967	437,962	492,421	19,156	\$2,604,643	\$472,737	\$508,199
Jan 18	11.50	7.00	361.45	262.00	14.98	13.67	355,138	521,095	457,394	518,559	7,891	\$1,995,079	\$156,142	\$213,132
Feb 18														
Mar 18														
Apr 18														
May 18														
Jun 18														
Jul 18														
Aug 18														
Sep 18														
Total							1,104,413	1,781,900	1,665,941	1,826,201	120,093	\$11,629,637	\$3,167,745	\$2,801,784
						Actua	generation a	s a percentag	e of average:	109.6%		(	Cost per MWh:	\$23.33

### Lake/Reservoir Levels

Lake Powell's elevation was 3,619 feet at the end of January, about 81 feet below the maximum reservoir level and about 129 feet above the minimum generation level. The storage volume for Lake Powell was 13.67 million acre-feet at the end of January, which is about 56 percent of capacity.

### Weather and Other Conditions

Current inflow forecasts into Lake Powell continue to be dry, with April – July inflows currently forecasted at 47 percent of average.



# **Desert Southwest Region**

	Snowpack (Inches in Snow		Lake/Reservoir Inflow		Lake/Reservoir Content						Purchase Power			
	Water Eq	uivalent)	(Thousand	Acre-Feet)	(Million A	cre-Feet)		Generatio	on (MWh)		(MWh)	Purchase F	ower Expense	s (Dollars)
							Projected	Most				Projected	Most	
	<u>Median</u>	<u>Actual</u>	<u>Average</u>	<u>Actual</u>	Average	<u>Actual</u>	Dry	<u>Probable</u>	<u>Average</u>	<u>Actual</u>	<u>Actual</u>	Dry	<u>Probable</u>	<u>Actual</u>
Oct 17	1.30	0.70	59.90	45.00	20.15	12.26	321,455	321,455	378,173	327,168	622	\$0	\$0	\$15,967
Nov 17	4.80	2.60	53.75	40.00	20.20	12.29	373,825	373,825	363,506	373,021	6,160	\$96,950	\$96,950	\$238,885
Dec 17	8.10	4.60	72.83	44.00	20.32	12.30	271,905	271,905	371,404	316,487	10,262	\$246,131	\$246,131	\$384,325
Jan 18	11.50	7.00	93.50	76.00	20.48	12.82	239,355	239,355	394,030	242,881	33,068	\$1,160,420	\$1,160,420	\$1,159,033
Feb 18														
Mar 18														
Apr 18														
May 18														
Jun 18														
Jul 18														
Aug 18														
Sep 18														
Total							1,206,540	1,206,540	1,507,113	1,259,557	50,112	\$1,503,501	\$1,503,501	\$1,798,210
						Actua	generation a	s a percentag	e of average:	83.6%		(	Cost per MWh:	\$35.88

#### Lake/Reservoir Levels

Lake Mead's elevation was 1,088 feet at the end of January, about 132 feet below the full storage level and about 138 feet above the minimum generation level. Lake Mead is projected to reach its annual peak elevation in February and drop to a minimum elevation of 1,076 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 was 66 percent of average at the end of January. The total side inflow into Lake Mead for water year 2018 is projected to be 710 thousand acre-feet, or 55 percent of the normal annual amount.

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		Lake/Reservoir Inflow		Lake/Reservoir Content						Purchase Power			
	Water Equivalent)		(Thousand	Acre-Feet)	(Million A	cre-Feet)		Generatio	on (MWh)		(MWh)	Purchase F	Power Expense	s (Dollars)
							Projected	Most				Projected	Most	
	<u>Median</u>	<u>Actual</u>	<u>Average</u>	<u>Actual</u>	Average	<u>Actual</u>	Dry	<u>Probable</u>	<u>Average</u>	<u>Actual</u>	<u>Actual</u>	Dry	<u>Probable</u>	<u>Actual</u>
Oct 17	0.00	1.00	135.50	239.20	3.92	4.72	94,856	104,129	92,921	102,835	73,854	\$1,612,050	\$1,456,780	\$1,700,855
Nov 17	3.70	3.40	118.80	205.90	3.88	4.72	63,717	94,184	63,235	90,440	69,165	\$980,138	\$1,865,825	\$1,670,392
Dec 17	12.00	12.40	98.00	106.40	3.83	4.68	96,244	104,950	97,078	93,454	79,107	\$614,713	\$1,458,113	\$1,944,026
Jan 18	19.70	19.00	96.70	131.40	3.80	4.62	127,240	115,455	92,940	105,200	59,513	\$1,013,650	\$628,963	\$1,447,095
Feb 18														
Mar 18														
Apr 18														
May 18														
Jun 18														
Jul 18														
Aug 18														
Sep 18														
Total							382,057	418,717	346,174	391,929	281,639	\$4,220,551	\$5,409,680	\$6,762,368
Actual generation as a percentage of average: 1										113.2%		(	Cost per MWh:	\$24.01

#### Lake/Reservoir Content

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

### Weather and Other Conditions

Hydrologic conditions for the Loveland Area Projects (LAP) area can vary from one river basin and watershed to another. LAP is currently drought free. The snowpack ranged from average in the Colorado River Basin to well above average in the Bighorn River Basin. The latest National Weather Service forecast indicates March, April, and May temperatures will most likely be at or below average in northwestern Wyoming and will likely be above average in southeast Wyoming and Colorado. The same forecast indicates precipitation will be equal to or below average for all of LAP. Winter generation in the Bighorn River Basin will be above average due to record high inflows during the previous runoff season and a need to evacuate space in the reservoirs. Winter generation in the Colorado River Basin is forecasted to be average because of a high volume of water stored in Lake Granby, and is also forecasted to be average in the North Platte River Basin.

Note: The Rocky Mountain Region's (RMR) most recent reported actual generation and purchase power data are provisional values. RMR previously reported snowpack data as a total for all reservoirs throughout LAP, but is now reporting that data as an average value.

# Sierra Nevada Region

	Snowpack (Inches in Snow Lake/Reserve		Lake/Reservoir Lake/Reservoir Inflow Content							Purchase Power				
	Water Equivalent)		(Thousand	Acre-Feet)	(Million A	cre-Feet)		Generatio	on (MWh)		(MWh)	Purchase F	ower Expense	s (Dollars)
							Projected	Most				Projected	Most	
	<u>Median</u>	<u>Actual</u>	<u>Average</u>	<u>Actual</u>	<u>Average</u>	<u>Actual</u>	Dry	<u>Probable</u>	<u>Average</u>	<u>Actual</u>	<u>Actual</u>	Dry	<u>Probable</u>	<u>Actual</u>
Oct 17			339.00	339.00	5.38	7.49	261,000	171,000	163,000	208,470	46,751	\$519,480	\$519,480	\$1,005,159
Nov 17			416.00	636.00	5.36	7.60	154,000	149,000	104,000	118,897	49,097	\$499,500	\$499,500	\$1,140,296
Dec 17	11.54	3.00	975.00	696.00	5.77	7.48	99,000	104,000	143,000	105,005	54,113	\$499,500	\$499,500	\$1,171,386
Jan 18	16.67	5.00	1,097.00	478.00	6.15	7.88	118,000	423,000	163,000	65,639	57,687	\$528,840	\$528,840	\$1,356,822
Feb 18														
Mar 18														
Apr 18														
May 18														
Jun 18														
Jul 18														
Aug 18														
Sep 18														
Total							632,000	847,000	573,000	498,010	207,649	\$2,047,320	\$2,047,320	\$4,673,663
						Actual	generation a	s a percentag	e of average:	86.9%		(	Cost per MWh:	\$22.51

#### Lake/Reservoir Content

As of January 31, accumulated inflow for the water year was 52 percent of the 15-year average for Trinity, 72 percent for Shasta, 91 percent for Folsom, and 89 percent for New Melones. Reservoir storage as of the same date was 119 percent of the 15-year average for Trinity, 118 percent for Shasta, 135 percent for Folsom, and 143 percent for New Melones.

### Weather and Other Conditions

As of January 31, cumulative precipitation of the Northern Sierra Eight Station Index was at 71 percent of average for the date. October precipitation was only 27 percent of average, November was 167 percent of average, December was the fourth driest on record, and then January was 80 percent of average.

Note: The Sierra Nevada Region's (SNR) average generation is based 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		Lake/Reservoir Inflow		Lake/Reservoir Content						Purchase Power			
	Water Equivalent)		(Thousand	Acre-Feet)	(Million A	cre-Feet)		Generatio	on (MWh)		(MWh)	Purchase F	Power Expense	s (Dollars)
							Projected	Most				Projected	Most	
	<u>Median</u>	<u>Actual</u>	<u>Average</u>	<u>Actual</u>	Average	<u>Actual</u>	Dry	<u>Probable</u>	<u>Average</u>	<u>Actual</u>	<u>Actual</u>	Dry	<u>Probable</u>	<u>Actual</u>
Oct 17	1.20	1.20	8,050.00	6,477.30	56.01	59.78	805,326	796,806	790,075	760,352	41,277	\$688,399	\$743,287	\$336,335
Nov 17	3.80	4.50	7,375.00	6,901.97	54.92	58.89	838,063	817,624	729,890	773,047	58,278	\$1,071,080	\$1,147,712	\$1,091,157
Dec 17	7.10	8.50	6,442.00	6,415.93	54.32	58.03	754,340	820,267	601,300	758,602	130,466	\$3,815,497	\$2,930,323	\$2,789,741
Jan 18	10.30	11.90	6,641.00	7,574.06	54.18	57.80	915,959	912,918	689,660	865,517	*	\$2,288,588	\$2,334,615	*
Feb 18														
Mar 18														
Apr 18														
May 18														
Jun 18														
Jul 18														
Aug 18														
Sep 18														
Total							3,313,688	3,347,614	2,810,925	3,157,518	230,021	\$7,863,563	\$7,155,938	\$4,217,233
						Actua	l generation a	s a percentag	e of average:	112.3%		(	Cost per MWh:	\$18.33

#### Lake/Reservoir Content

As of February 14, the active conservation pools for the Canyon Ferry and Yellowtail Dams were 75.9 percent and 81.9 percent full, respectively.

### Weather and Other Conditions

The January runoff was 153 percent of normal. Runoff was above average in the Fort Peck, Garrison, Fort Randall, and Gavins Point reaches, but below average in the Oahe reach. Snowpack reports show 114 percent of average above Fort Peck and 124 percent of average in the Fort Peck to Garrison reach. The U.S. Drought Monitor shows that much of the upper Missouri River Basin continues to be impacted by drought, with severe (D2) drought conditions present in northeastern Montana and western South Dakota while abnormally dry (D0) or moderate (D1) drought conditions remain over the broader region.

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 data is not available for the month.

