

# **APPENDIX AA**

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## **PLANT SURVEY VALIDITY MEMO**



## **TECHNICAL MEMORANDUM**

**TO:** John Norman / Brookfield Sunset, LLC

**FROM:** Dave Krolick, Project Manager / ECORP Consulting, Inc.  
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**DATE:** 6 March 2016

**RE:** Plant Survey Validity for Amoruso Ranch

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ECORP Consulting, Inc. (ECORP) analyzed available precipitation data from Folsom Dam to address concerns of drought on the validity of special-status plant surveys for Amoruso Ranch (Project). For this analysis, ECORP looked at 65 years (1951-2015) of precipitation data collected at Folsom Dam to represent local drought conditions for the region. The rain gauge at Folsom Dam is located approximately 13 miles southeast of the Project area. Given the proximity of the Folsom Dam rain gauge, ECORP is confident that precipitation data collected at Folsom Dam is indicative of conditions at the Project area.

The 65 years of precipitation data was summed on a water year basis (October through September). While the available 2015 precipitation data is only complete through April, this data was included in this analysis as most precipitation occurs in the October through April timeframe. Overall, the average annual precipitation is 23.8 inches, with a standard deviation of 8.8 inches. The average precipitation from 2005-2015 (within the timeframe during which surveys were conducted at the Project area) is 20.5 inches, which is within one standard deviation of the long-term average.

The last 11 years of precipitation data are shown in Table 1, including total inches of precipitation and the percent of average. Total precipitation for seven of the last 11 years fall within one standard deviation of the 65-year mean. For the remaining four years (2006, 2007, 2008, and 2014) were not within this range, three of these years (2007, 2008 and 2014) were drier and one (2006) was wetter than average.

Surveys were conducted within the Project area in 2009, 2011, and 2015. In addition, surveys were conducted at off-site mitigation properties (Mourier East, Mourier West, and Skover) in 2015. These offsite mitigation properties are located 0.5-2.5 miles east of the Project area. The special-status plant surveys of the Project area and off-site mitigation properties were conducted during years that fell within the "normal" range of annual precipitation (i.e. within one standard deviation).

**Table 1. Folsom Dam Precipitation Data Compared with Surveys Completed**

<b>Water Year</b>	<b>Total Inches of Precipitation</b>	<b>Percent of Average</b>	<b>Within One Standard Deviation of Mean</b>	<b>Survey Completed</b>
2005	28.2	119%	Yes	
2006	38.4	162%	No (Wetter)	
2007	11.8	50%	No (Drier)	
2008	12.3	52%	No (Drier)	
2009	16.6	70%	Yes	Amoruso
2010	19.8	83%	Yes	
2011	30.9	130%	Yes	Amoruso
2012	17.5	73%	Yes	
2013	19.4	82%	Yes	
2014	14.9	63%	No (Drier)	
2015	15.8	67%	Yes	Amoruso, Mourier East, Mourier West, Skover
1951-2015 Average	23.8	--		
2010-2015 Average	20.5	86%		

Despite assertions that drought conditions in the last several years preclude adequate survey efforts for special-status plant species, analysis of precipitation data does not support this claim. Surveys were conducted in “normal” years, and given the multiple rounds of surveys over a seven-year period, ECORP is confident in the validity of the results of the special-status plant surveys for Amoruso Ranch.