

EXHIBIT SJWD-1

TESTIMONY OF SHAUNA LORANCE, P.E.

1. My name is Shauna Lorance. I have been the General Manager of San Juan Water District since 2003, and I have worked for San Juan Water District in various other roles since 1996. I have a Bachelor's of Science degree in Mechanical Engineering from UC Davis. I am also a registered Civil Engineer, Certificate No. C47304.
2. **Exhibit Folsom-3** is a joint PowerPoint presentation that summarizes key points of this testimony. Exhibit Folsom-3 represents the "summary of testimony" requested by the SWRCB.
3. San Juan Water District ("SJWD") provides water to municipal and industrial ("M&I") connections located in northeast Sacramento County and southeast Placer County, approximately 20 miles northeast of downtown Sacramento. Substantially all of SJWD is unincorporated, with small portions in the City of Citrus Heights, the Ashland area of the City of Folsom, and the City of Roseville. SJWD's boundaries also include the communities of Granite Bay, Fair Oaks and Orangevale. SJWD comprises an area of approximately 28,476 acres (over thirty-seven square miles). Within that area, SJWD provides both wholesale and retail water service. SJWD provides wholesale water supplies to four agencies outside the SJWD retail service area which serve approximately 160,000 people, while the District's retail service supplies approximately 31,000 people within approximately 10,715 acres. **Exhibit SJWD-3 is a map that shows the boundaries of SJWD.**
4. The four wholesale customer agencies (WCAs) that receive water from SJWD are Citrus Heights Water District, Fair Oaks Water District, Orange Vale Water Company, and the Ashland area of the City of Folsom. Two of these four WCAs have access to groundwater within their service area and were able to access those supplies during the recent drought to reduce their use of surface water, but two of the WCAs do not have the ability to serve customers with groundwater. At this time, as discussed in more detail below, SJWD's ability to serve its retail service area with groundwater is also very limited. **Exhibit SJWD-4** are pictures of the pipes at Folsom Dam through which San Juan normally receives its water.

SJWD's Water Demands

5. In 2013, the latest year before SJWD began implementing significant water conservation measures in response to the Governor's drought proclamations and the SWRCB's conservation regulations, SJWD delivered 48,268 acre-feet of water. San Juan's last 10 years of water deliveries are stated in **Exhibit SJWD-5**. SJWD projects that its combined retail, wholesale and conjunctive use water demand will be 82,200 acre-feet per year by 2030.
6. SJWD is currently conducting a study to determine the best options for conjunctive use. During the drought, when SJWD was concerned about the reliability of Folsom

Reservoir water supplies due to the very low water levels, SJWD entered into an agreement with Sacramento Suburban Water District (SSWD) to construct a pump station that can pump groundwater from SSWD into the portions of the SJWD wholesale service area that do not have access to groundwater. This agreement does not provide a firm source of groundwater supply; it is intended to address drought and other emergency conditions. Groundwater is only available when SSWD has excess supply available.

**SJWD's Historic Senior Water Rights on the American River
and Its 1954 Settlement with the United States**

7. As the successor-in-interest of the North Fork Ditch Company, SJWD holds the most senior water right on the North Fork of the American River, with a priority date of 1853. Under this right, SJWD is entitled to divert 26,400 acre feet per year from the American River at a rate of up to 60 cfs.
8. Initially, this water right was obtained by a mining company to provide water for gold mining. In 1853, the Natoma Water and Mining Company was operating a water diversion and canal system for the mining operations on the South Fork of the American River and began plans to construct a diversion dam and conveyance system for the mining operations on the North Fork. The South Fork and the North Fork of the American River join about three miles upstream of Folsom. The notice of appropriation of 3,000 miner's inches (about 60 cfs) of water for the pre-1914 water right for mining, agricultural, mechanical and other purposes was posted at the dam site that same year.
9. In 1854, the North Fork Water and Mining Company was formed, a rock diversion dam was constructed on the North Fork American River, and water diversions under the right commenced.
10. The North Fork diversion dam was located at Tamaroo Bar, about two and one-half miles southeast of Auburn, two miles above the confluence of the North Fork and Middle Fork American River, and about thirty-three miles upstream from what is now the City of Folsom. The system of ditches and flumes that was constructed to convey water from the diversion dam for the hydraulic mining operations had a capacity of about 60 cfs and became known as the "North Fork Ditch." North Fork's rock diversion dam was damaged by flood waters from time-to-time and was rebuilt several times before 1898, when a masonry dam was constructed immediately downstream from the location of the original dam.
11. In 1898, the Sacramento Electric, Gas and Railway Company (owner of the Folsom Dam that existed at that time) brought suit to claim a portion of the North Fork Ditch Company water right. On August 5, 1898, the Sacramento County Superior Court issued an adjudication decision that confirmed the scope and nature of North Fork's pre-1914 water right in the case of *Sacramento Electric, Gas and Railway Company v. CW Clarke, etc.*, Action No. 7815, Judgment No. 5353. **Exhibit SJWD-6** is a copy of the 1898 judgment confirming the 1853 water right.

12. Over time, the use of the water changed as mining operations ceased and the Sacramento region developed. By 1914, North Fork's main canal was twenty-five miles long, had eleven miles of branch canals, three reservoirs, and twenty-seven and one-half miles of main and lateral pipes, consisting of the main pipes supplying water to the communities of Orange Vale and Fair Oaks.
13. To distribute irrigation water from the North Fork Ditch, the Orange Vale Mutual Water Company was incorporated in 1896, the Fair Oaks Irrigation District was organized in 1917, and the Citrus Heights Irrigation District was organized in 1921.
14. In 1928, the North Fork Ditch Company sought to expand its supplies, and, to that end, it filed an application for an appropriative water right (Application No. 5830) to divert 35 cfs from the North Fork American River for irrigation and domestic use. This application was approved by the California Division of Water Rights and North Fork was issued Permit No. 4009 in 1932.
15. When the United States was planning the construction of Folsom Dam and Reservoir, it recognized that the new CVP facilities would interfere with the operation of the North Fork diversion dam and ditch through which North Fork had been exercising its American River water rights. The United States subsequently entered into a series of agreements with North Fork to resolve water rights and water system relocation issues.
16. As a result, on July 21, 1950, the North Fork Ditch Company entered into an agreement with the United States (through the Corps of Engineers, Contract No. DA 04 167 eng 182) for the partial relocation of the North Fork diversion dam and the ditch; a supplemental relocation agreement was entered into in November 1950 (Supplemental Agreement No. 1). **Exhibit SJWD-7** and **SJWD-8** are copies of this contract, Contract No. DA 04 167 ENG 182, and the Supplemental Agreement No. 1.
17. In 1951 – 52, the United States and North Fork continued to negotiate the terms of a proposed water rights settlement agreement. In a memorandum dated March 20, 1952, the United States discussed the results of a six-month investigation by the United States to confirm the water rights of the North Fork Ditch Company, which concluded that the Company had a right (under its pre-1914 water right and water right permit no. 4009) to divert about 33,000 acre-feet per year at a maximum diversion rate of about 75 cfs. **Exhibit SJWD-9** is a copy of this memorandum.
18. In the meantime, the United States proceeded with the construction of the new Folsom Dam. In 1954, as Folsom Reservoir began to fill behind the new Folsom Dam, water backed up to the base of the North Fork Ditch Company diversion dam and interfered with the operation of the United States' Folsom project. Consequently, the United States and North Fork negotiated another agreement, and on April 12, 1954, the North Fork Ditch Company and the United States entered into another facilities relocation and water right settlement agreement (the "1954 Settlement Agreement," Contract No. DA 04 167 eng 610). **Exhibit SJWD-10** is a copy of the 1954 Settlement Agreement.

19. The 1954 Settlement Agreement: (1) provided for the North Fork Ditch Company to abandon the remaining parts of the diversion dam and ditch facilities, and related property interests, that would interfere with the United States' operation of Folsom Dam and Reservoir; (2) acknowledged the priority and beneficial use for over 95 years of North Fork's American River water rights; and (3) provided for the United States to construct certain water conveyance facilities, to operate and maintain those facilities, and to deliver the water supply under North Fork's water rights in perpetuity and without reduction from Folsom Reservoir to the New Hinkle Reservoir (which was to be constructed by the United States). Article 4 of the 1954 Settlement Agreement states, in pertinent part:

“The Contractor [the North Fork Ditch Company] represents and the Government recognizes that the Contractor possesses the right to divert amounts of water to 75 cubic feet per second of the waters of the North Fork of said river, such right being based on a filing in the records of the County of Placer, State of California in 1853, an adjudication of said filing in 1898 in the Superior Court of the County of Sacramento, State of California, Action No. 7815, Judgment No. 5353, and on Permit No. 4009 issued on 26 October 1932 by the Division of Water Resources of the State of California, subsequent diversion and use in whole or in part continuously since that time, and application and devotion of the water so diverted to beneficial use. In preservation of such right and to insure the availability to the Contractor of the amount of water from the North Fork of the American River to which the Contractor is entitled by virtue of such right, the parties agree as follows: (a) The rate of delivery of water to the Contractor by the Government at any particular time shall not exceed a total of 75 cubic feet per second. (b) The rate of delivery of water by the Government to the pipe line . . . at any particular time shall not exceed 13 1/3 percent of the total of 75 cubic feet per second established in (a) above. (c) The total amount of water delivered to the Contractor by the Government in any one calendar year shall not exceed 33,000 acre feet. (d) The Government, with the limitations established in (a), (b) and (c) above and the further limitation that the water must be devoted to a beneficial use, shall deliver to the Contractor as much water as the contractor may request. . . . Subject to the provisions of this contract, no interest in the water rights possessed by the Contractor shall be considered to have been transferred to the Government hereunder, and no storage space in Folsom Reservoir shall be considered as being involved in this contract, except to the minimum extent in each instance necessary to enable the Government to comply with the terms thereof and to provide at the times and in the quantity specified herein the water to be received by the Contractor and to which it is recognized the Contractor is entitled. . . .”

20. The 1954 Settlement Agreement contains no shortage provision and does not reduce the water supply available to SJWD under its senior water rights in dry years.
21. Meanwhile, local agencies in the Sacramento Region had been watching the progress of the Folsom Dam and Reservoir project with great interest. In 1947, and then again in 1953, representatives of Orange Vale Mutual Water Company, Fair Oaks Irrigation District, and Citrus Heights Irrigation District formed a committee to

study the water supply needs of the area and concluded that they should acquire the North Fork Ditch Company's water system and water rights and promote the formation of a master water district to own and operate the North Fork water system. During the process of organizing the new district, the retail water customers of the North Fork Ditch Company and other water users in Placer County asked to be included within the new district. The question of whether to form a master water district that would purchase the water rights of the North Fork Ditch Company was then put to a vote of the people within the proposed new service area on February 10, 1954. Nearly two-thirds of the voters approved, and, as a result, SJWD was formed on February 15, 1954.

22. On May 25, 1954, consistent with its mandate from the voters, SJWD entered into an agreement with the North Fork Ditch Company under which SJWD acquired all of North Fork's water system and water rights, including the rights under the April 12, 1954 Settlement Agreement with the United States. SJWD therefore is the successor-in-interest to North Fork's American River water rights. **Exhibit SJWD-11** is SJWD's agreement to acquire North Fork Ditch Company.
23. On April 17, 1955, Reclamation made the first water delivery from Folsom Reservoir to SJWD.
24. In 1961, the State Water Rights Board issued SJWD, as the successor-in-interest to North Fork, water right License No. 6324 on Permit no. 4009; this license authorizes SJWD to divert 15 cfs from June 1 through November 1 of each year for irrigation and domestic uses within SJWD's boundaries. A change in the point of diversion (to Folsom Dam) and place of use (to include the area within SJWD) was approved by the Division of Water Rights in 1967.
25. SJWD's 1853 and 1928 historic senior water rights provide the primary source of water supply for both the District's retail and wholesale service areas.

SJWD's Central Valley Project Water Service Contract

26. As noted above, one of the four Wholesale Customer Agencies to which SJWD provides water is Fair Oaks Water District, which is the successor-in-interest to Fair Oaks Irrigation District (collectively, "Fair Oaks"). Prior to 1958, Fair Oaks, due to its proximity to the American River, had filed its own water rights application, Application 12300, for a permit to appropriate from the American River 50 cfs by direct diversion between April 1 and October 31 and 25,500 acre-feet per year (AFY) by storage between October 1 and June 1, for irrigation and domestic purposes. D 893, p. 5; see also p. 34 (listing the "applications by other entities to appropriate from the American River system for municipal, domestic and/or irrigation purposes within Sacramento County," including the application by Fair Oaks).
27. In Decision 893, the State Water Rights Board considered the water rights application filed by Fair Oaks as well as the water rights applications filed by USBR and others to divert water from the American River and store it at Folsom Reservoir. A copy of Decision 893 can be found in **Exhibit Roseville-5**. The State Water Rights Board discussed the "Watershed Protection Considerations" and the application of

the watershed of origin statutes to the United States. D 893, pp. 34 – 35, 48 – 54, 71 - 73. The State Board noted that Fair Oaks and other parties within the watershed of the American River upstream of Nimbus Dam had protested the United States' applications; the State Water Rights Board described these protests as follows: "some assert their own claimed rights and express apprehension that the diversions that the applicants propose, or some of them, will leave insufficient stream flow to satisfy those rights; others, filed by entities who are themselves applicants, set forth reasons why, in their opinion, their own applications should have precedence." D 893, p. 48. The State Water Rights Board found that these protests did not "necessitate denial of any of the applications" filed by the United States. D 893, p. 48. Rather, the State Board held that the protestants' objections "focus attention . . . upon the necessity of so conditioning permits in certain instances as to prevent injuries that the protestants apprehend." D 893, p. 48.

Consequently, the State Water Rights Board found that Applications 13370, 13371, 13372, and 14662, by the United States, "are eligible for approval . . . provided that rights acquired thereunder remain subject to reduction by appropriation of water for reasonable, beneficial use within the watershed above Folsom Reservoir, provided that releases past Nimbus Dam are sufficient at all times to satisfy demands under downstream rights and requirements for fish conservation and salinity control, provided that deliveries outside of Placer, Sacramento, and San Joaquin Counties are sufficiently restricted to ensure the satisfaction of such demands as developed within those counties, provided such development is undertaken within a reasonable period, and provided that licenses when issued shall be issued to the public agencies of the State within which the water is found to have been put to beneficial use." D 893, p. 51.

At the same time, the State Water Rights Board found that Fair Oaks, being within the area "naturally dependent" on the American River, would be better served by a contract with the United States and the insertion of terms in the United States' permits requiring fulfillment of local water supply needs prior to any exports of American River water:

The point or points of diversion under each of those applications is Folsom Dam and/or Nimbus Dam to which right of access has not been acquired by the applicants. Accordingly, issuance of permits to those applicants would be meaningless in view of the obvious necessity of contracting with the United States for a supply of water from the Federal facilities. The service areas which those applicants desire to supply may be supplied equally well and with less administrative confusion by contract with the United States. Permits are being issued to the United States to appropriate enough American River water to adequately supply the applicants naturally dependent on that source and availability of water to such applicants is reasonably assured by the terms to be contained in the permits to be issued to the United States restricting exportation of water under those permits insofar as exportation interferes with fulfillment of needs within Placer, Sacramento and San Joaquin Counties. Other applicants in more remote areas must if necessary seek water from other sources.

D 893, p. 54.

28. After considering these competing interests in the use of the waters of the American River, the State Water Rights Board ordered that Applications 13370, 13371, 13372, and 14662 of the United States be approved, but the permits were to include the following terms and conditions:

11. The amounts which may be diverted under rights acquired or to be acquired under these permits are and shall remain subject to reduction by future appropriation of water for reasonable, beneficial use within the watershed of Folsom Reservoir. D 893, p. 71.

[¶¶]

14. Deliveries of water under permits issued pursuant to Application 13370 and 13371 shall be limited to deliveries for beneficial use within Placer, Sacramento and San Joaquin Counties and shall not be made beyond the westerly or southerly boundaries thereof, except on a temporary basis, until the needs of those counties, present or prospective, are fully met, provided, however, that agreements in accordance with Federal Reclamation laws between permittee and parties desiring such service within said counties are executed by July 1, 1968. D 893, p. 72.

15. The right to divert and store water and apply said water to beneficial use as provided in the permits issued pursuant to Applications 13370 and 13371 is granted to the United States as Trustee for the benefit of the public agencies of the State together with the landowners and water users within such public agencies as shall be supplied with the water appropriated under the permits. D 893, p. 72.

16. Subject to compliance by the public agencies concerned with any and all present and future valid contractual obligations with the United States, such public agencies, on behalf of their landowners and water users, shall, consistent with other terms of the permits, have the permanent right to the use of all water appropriated and beneficially used under permits issued pursuant to Applications 13370 and 13371, which right, except where water is distributed to the general public by a private agency in charge of a public use, shall be appurtenant to the land to which said water shall be applied, subject to continued beneficial use and the right to change the point of diversion, place of use, and purpose of use, as provided in Chapter 10 of Part 2 of Division 2 of the Water Code of the State of California, and further subject to the right to dispose of a temporary surplus. D 893, pp. 72-73.

17. Upon completion of the appropriation and beneficial use of water under the permits, any license or licenses which may be issued in the matter of Applications 13370 and 13371 pursuant to Chapter 9 of Part 2 of Division 2 of the California Water Code shall be issued to the public agencies of the State within which the water shall have been found by inspection by the Board to have been applied to beneficial use. D 893, p. 73.

In other words, the State Water Rights Board determined that Fair Oaks, being within the area “naturally dependent” upon the American River, would be provided a set of assurances, adopted as a set of terms and conditions in Reclamation’s permits, that it would be provided a reliable water supply from Folsom Reservoir.

29. As indicated above, SJWD was formed in 1954 to serve as the “master water agency” to deliver water to Fair Oaks and the other WCAs. Consistent with the State Water Rights Board’s Decision 893, the United States negotiated a contract with SJWD to provide Fair Oaks, and the other areas within the watershed served by SJWD, with water from Folsom Reservoir. SJWD signed its first water service contract with Reclamation for CVP supplies in 1962.
30. Initially, SJWD’s water service contract provided for 40,000 af of water per year to provide for the District’s immediate and future needs. However, in the late 1960s, Reclamation staff worked out a mathematical formula for the District’s future needs and then, in 1967, reduced the contract amount from 40,000 AFY to 11,200 AFY. SJWD immediately requested that Reclamation reinstate the original 40,000 AFY amount, but SJWD was not successful in persuading Reclamation.
31. However, in 1990, Public Law 101-514 directed the Secretary of the Interior to enter into CVP water supply contract with SJWD for an additional 13,000 AFY of water supply, known as the “Fazio water” after Rep. Vic Fazio, who sponsored the legislation; the water service contract for this additional 13,000 AFY was entered into on December 7, 2000. In 2004, after passage of Public Law 108-137, the two contracts were combined into one CVP long-term water service contract that provides SJWD with 24,200 AFY of water supply.
32. SJWD signed its long-term water service contract in 2006. The contract has a term of 40 years. **Exhibit SJWD-12** is a copy of the District’s 2006 long-term CVP water service contract. In general, the M&I water supplies provided under this contract can be reduced during dry years to 75% of total contract amount. Should hydrology result in severely limited water supplies, M&I can be further reduced down to health and safety levels, but only after agricultural contracts have been reduced to 0 percent allocations.

SJWD’s Contract with Placer County Water Agency

33. In 1972, after Reclamation reduced the amount of water available to the District under its water service contract and the District was unable to persuade Reclamation to reverse that decision, the District sought other sources of supply to ensure that it would have sufficient water to meet future demands. SJWD then entered into a contract that entitles it to receive water from Placer County Water Agency; a revised contract was signed December 7, 2000. **Exhibit SJWD-13** is a copy of SJWD’s 2000 contract with PCWA. It is a take-or-pay contract, meaning that the District must pay for the water whether or not it takes delivery of it. This contract extends through 2021 and is renewable for 20-year periods. It provides for 25,000 AFY water to be supplied to the District.

34. The PCWA contract places a first priority on use in Placer County, but allows use of any water not needed in Placer County to be used in Sacramento County. However, the delivery of water to SJWD from PCWA requires a Warren Act contract with the United States, and SJWD's current Warren Act contract with the USBR limits the use of PCWA water to the Placer County portion of the District service area unless the place of use is modified by the contracting officer. **Exhibit SJWD-14** is a copy of Warren Act contract No. 6-07-20-W1315.

Risks of Injury to SJWD's Water Supply by Proposed Cal Water Fix Project

35. As discussed above, SJWD has water rights to receive surface water supplies from the American River and contracts that provide for those supplies to be delivered from Folsom Reservoir through the Folsom Lake M&I intake. Normally, raw water is delivered to SJWD, Roseville, Folsom, and Folsom Prison via Folsom Dam's Pumping Plant. Refer to **Exhibit Folsom-18**, a cross section of the dam at Folsom Reservoir showing the M&I water supply intake and other water intakes.
36. The M&I intake is the only existing physical means by which SJWD can access its full quantity of surface water supplies. There is an emergency pump located in the penstocks that can supply a minimum level of surface water to the cities of Roseville and Folsom and SJWD, as discussed further below, but that emergency measure is not adequate to convey even the full amount of SJWD's historic water rights.
37. Folsom Reservoir's maximum storage volume is approximately 977,000 acre-feet of water. As shown on Exhibit Folsom-18, the center line of the M&I water intake is at elevation 317 feet above mean sea level (msl), at which point the reservoir holds approximately 65,000 acre-feet. If the lake were to drop to this level, the M&I water intake would be exposed (partially out of the water).
38. However, even before the M&I intake pipe is exposed, SJWD and the other agencies that depend on the M&I intake pipe would have water supply problems because the intake pipe becomes unsafe to use when there is not enough water in the reservoir above it. When the lake level is at 330 feet above msl, or about 89,000 acre-feet of water in storage, the existing pumping plant could incur damaging vortices because too little water would be present above the dam's M&I raw water intake. When there is not enough water above the intake to take the place of the water that is being pumped out, pumping through the intake causes a vortex of air to form, which has a cyclone-like shape and depth. Because of the vortex, air could be carried into the pipe and ultimately reach the pumps themselves. Air in the pumps causes cavitation, which in turn causes destructive shock waves to the pump impellers. Because of these risks, the M&I raw water intake pipe at Folsom Lake becomes unusable when the reservoir level drops too low, even if the intake is still submerged. **Exhibit Folsom-19**, "Increasing Water Supply Pumping Capacity at Folsom Dam, January 1996, ESA Consultants, Inc." discusses this phenomenon.
39. Operational levels at Folsom Reservoir during the 2014-2015 drought have proven that these risks to SJWD's surface water supplies are real. After the calendar year of 2013 was historically dry and January 2014 also was dry, Folsom Reservoir dropped to 162,617 acre-feet by early February, according to information available

from the California Data Exchange Center (CDEC). During November and December 2013, according to SJWD's review of information from CDEC, Reclamation was releasing between approximately 1,100 and 1,500 cubic feet per second (cfs) from the reservoir to the lower American River. Based on my conversations with Reclamation staff and others at that time, I understand that those releases were intended to protect fall-run Chinook salmon redds that resulted from fall 2013 spawning. At that release rate, without additional precipitation, we estimated that the water level in Folsom Reservoir would have dropped below the top of the M&I intake by the end of March 2014. **Exhibit Folsom-20** are photographs of Folsom Reservoir from late January 2014 several weeks before the reservoir reached its low point that winter. **Exhibit Folsom-21** is a widely circulated photograph comparing the condition of Folsom Reservoir at full storage in 2011 and early in 2014. I observed the reservoir in the conditions of full storage in 2011 and during early 2014. Folsom-20 and Folsom-21 accurately depict the condition of the reservoir at those times.

40. Fortunately, Reclamation and the State Water Resources Control Board recognized the need to ensure adequate carryover storage for SJWD's and other municipal water suppliers to be able to meet minimum health and safety requirements, and the rate of release from Folsom Reservoir was reduced in 2014. Reclamation informed us that its goal was to try to manage the remaining supplies to attain an end-of-September storage at Folsom Reservoir of 293,000 – 297,000 acre-feet, under the 90% exceedance forecasts, as contemplated by the Drought Operations Plan Reclamation and DWR submitted to the SWRCB in April 2014.
41. The risk to SJWD's water supplies was just as serious in 2015, though the water year progressed differently. With very little snowpack, Folsom Reservoir's storage peaked at 574,885 AF on March 15, 2015. Storage then declined steadily throughout nearly the entire remainder of 2015 to a historic low level of 135,561 on December 4, 2015. This water level information is based on SJWD's review of information from the California Data Exchange Center. **Exhibit Folsom-24** consists of pictures of Folsom Reservoir from September and November 2015. I observed the reservoir in September and November 2015. Exhibit Folsom-24 accurately depicts the condition of the reservoir at that time.
42. Throughout 2014 and 2015, SJWD's representatives engaged in frequent communications with Reclamation representatives concerning planned operations of the Central Valley Project and Folsom Reservoir. Based on those conversations, I understand that Reclamation made relatively high releases from Folsom Reservoir in the spring and summer of 2015 to contribute to the implementation of Delta water quality requirements while attempting to maintain cold-water storage in Lake Shasta to support winter-run Chinook salmon spawning in the Sacramento River. These releases depleted available storage in Folsom Reservoir.
43. Throughout 2015, there was serious concern that continued dry conditions eventually would result in Folsom Reservoir's water level dropping below the level where the dam's M&I intake would be rendered unsafe to use. A repeat of the extremely dry conditions in late 2013 and early 2014 could have created that

situation. Reclamation's planning to avoid this condition was a major topic of discussion between SJWD and Reclamation throughout 2015.

44. To avoid the safety problems posed by the creation of a vortex and to assure delivery of needed public health and safety water supplies, when the lake level was approaching 340 feet above msl, SJWD and the other water agencies that take water from Folsom Reservoir worked closely with Reclamation's Central California Area Office Manager Drew Lessard and his staff to develop emergency measures. For Roseville's and SJWD's supplies, the emergency measures consisted of an emergency pump (E-Pump) located at a lower elevation than the M&I intake that would pump raw water from one of the dam's hydropower penstocks. The E-Pump would allow continued delivery of water supplies to SJWD and Roseville if the lake dropped to 330 feet above msl. If the level of the reservoir continued to drop and was reduced below the level where the E-Pump could be safely operated, the plan was to float a temporary pumping system in the reservoir to supply SJWD and Roseville. As noted above, the M&I intake pipe from Folsom Reservoir is the only existing physical means SJWD has to access its surface water supplies. If reduced reservoir levels render it unsafe to use the M&I intake, SJWD would not be able to access its historic senior surface water supplies unless the emergency measures were implemented successfully.
45. In 2015, Reclamation staff, including Central California Area Office Manager Drew Lessard, indicated that, if Folsom Reservoir's level were projected to drop below elevation 340 feet above msl, or 111,945 acre-feet of storage, at any time, Reclamation would plan to serve limited supplies to SJWD and Roseville through the dam's E-Pump. **Exhibit Folsom-22** shows a figure of the initially-proposed emergency pump facilities. Activating these emergency facilities would allow Reclamation to avoid the creation of the vortex rendering the M&I intake unsafe to use at low lake levels.
46. According to Reclamation, the E-pump cannot be utilized to deliver water from the hydropower penstock when Folsom Reservoir's level is below elevation 309 feet above msl, or 53,858 acre-feet. Reclamation staff indicated that, if the reservoir's water level were to be projected to decline below 309 feet above msl, then Reclamation would procure and install a floating pump station on Folsom Dam's right-wing dam; this would be a 30-40 CFS floating pumping system similar to the system Reclamation installed on the left wing dam in October 2015 to potentially serve the City of Folsom and Folsom Prison. Reclamation further indicated that submersible pumps for the proposed arrangement on the right-wing dam could be specified to draw water from as low as elevation 280 feet above msl, or 22,932 acre-feet, to deliver water to SJWD and Roseville.
47. Reclamation staff provided to SJWD the information below in Table 1 for storage, elevations and pumping capacities associated with use of the existing E-Pump for SJWD and Roseville and the use of a floating pumping system for the City of Folsom. The information in the table concerning the "North Fork Line" is for capacity for deliveries to SJWD and Roseville on the north side of Folsom Dam. The information in the table concerning the "Natoma Line" concerns capacity for

deliveries to the City of Folsom and Folsom Prison on the south side of Folsom Dam. Refer to **Exhibit Roseville-16**, the “Folsom Drought Emergency Action Plan.”

Storage (TAF)	Elevation (FT)	Temporary/Rental System Natoma Line (CFS)	E-Pump in series with Main Pumping Plant - North Fork Line (CFS)	Total Pumping (CFS)
112	340	N/A	N/A	
89	330	N/A	N/A	
70	320	30	70	100
62	315	30	70	100
55	310	30	70	100
	<309	30	0	30

48. The hydrologic modeling on which the Bay Delta Conservation Plan draft environmental impact report/environmental impact statement (EIR/EIS) and the California WaterFix recirculated draft EIR/supplemental draft EIS (RDEIR/SDEIS) are based indicates that, with operation of the proposed California WaterFix project under the one modeled climate change scenario and with demand growth, Folsom Reservoir would be drained to approximately 100,000 acre-feet during 10% of all years in the future. These results are shown in, among other places, Figure 8 of the RDEIR/SDEIS’s hydrologic modeling Appendix B. A copy of that figure is **Exhibit Folsom-25**. It is not clear whether Folsom Reservoir actually would be drawn lower than 100,000 acre-feet with the California Water Fix project because 100,000 acre-feet is the lowest level for the reservoir depicted in the modeling for the RDEIR/SDEIS.
49. In addition, the modeling for the RDEIR/SDEIS does not appear to reflect realistic Central Valley Project/State Water Project operations. For example, I understand that the H4 scenario (which is part of the EIR/EIS’s Alternative 4 and the RDEIR/SDEIS’s Alternative 4A) involves higher Delta outflows than the H3 scenario that is part of those Alternatives. Figure 8 in the RDEIR/SDEIS’s hydrologic modeling Appendix B, however, shows that end-of-September Folsom Reservoir storage would be significantly higher in the driest of years under the H4 scenario than under the H3 scenario. As noted above, a copy of that figure is Exhibit Folsom-25.
50. In spring 2016, in preparation for this hearing, Reclamation and DWR released new modeling of the project; this modeling had not previously been included in the RDEIR/SDEIS. DWR-514 summarizes the results of the Spring 2016 modeling. Figure 14 of DWR-514 shows Simulated End of September Folsom Storage under the Spring 2016 modeling. According to Figure 14, with the proposed project, in 5% of the years, Folsom Reservoir storage will be drawn down to 90,000 acre-feet or less

at the end of September. Again, it is not clear whether the actual lake level would be less than 90,000 acre-feet because 90,000 acre-feet is the lowest value that can be obtained under the Spring 2016 version of the model.

51. At 90,000 acre-feet of storage, as projected by DWR-514, the lake level elevation of Folsom Reservoir is about 330 feet above msl – just at the level where the vortex could be encountered and the M&I intake becomes unsafe to use. Through the Cal Water Fix project, Reclamation proposes to make voluntary, discretionary changes to the CVP, which will, in one out of every 20 years, draw Folsom Reservoir down to a level where Reclamation has deemed it would be unsafe to divert water through the M&I intake. Obviously, this poses a serious risk of injury to SJWD and the other agencies that rely on that intake for their water supplies.
52. Even if the more generous lake level projection of the RDEIR/SDEIS were accepted, the end-of-September storage for Folsom Reservoir with the project would be 100,000 acre-feet (or less) in 10% of the years. At this level, Folsom Reservoir would be only 10,000 acre-feet away from potentially encountering the vortex – and this level is more than 11,000 acre-feet below the margin of safety established in 2015 when Reclamation announced it would implement emergency measures if the lake dropped below 111,945 acre-feet (or 340 feet above msl).
53. Moreover, neither the modeling results depicted in Figure 8 of the RDEIR/SDEIS nor the modeling results depicted in Exhibit 14 of DWR-514 are consistent with SJWD’s experience during the drought conditions in 2014 and 2015, when I understand from our extensive communications with Reclamation staff that Reclamation was releasing water from Folsom Reservoir in the spring and summer specifically to maintain Delta outflows in light of the Coordinated Operations Agreement and because Reclamation believed it needed to try to hold water in Lake Shasta to maintain a cold-water pool to support later winter-run Chinook salmon spawning. Under the dry conditions experienced in 2014 and 2015, end of September Folsom Reservoir storage levels were significantly lower than would be expected under normal operations.
54. With CalWaterFix, as proposed, there is a great deal of uncertainty as to how the project will be operated. The DEIR/EIS, the RDEIR/SDEIS, the draft and final Biological Assessments, and the evidence submitted at this hearing do not contain any operations plan that explains how the CVP and SWP would operate with the proposed Delta tunnels in place. It is possible that, with the tunnels in operation, Folsom Reservoir could be drawn down at least as far as stated in Figure 14 of DWR-514, that is, to 90,000 acre-feet of storage, or less, at the end-of-September. While Reclamation and DWR’s operators, Ron Milligan and John Leahigh, testified that the projects would not actually be operated as depicted in the modeling, without an operations plan or other enforceable criteria in place, SJWD and the other agencies dependent on Folsom Reservoir water supplies do not have any assurance that the operations shown in the modeling will not be carried out.
55. If Folsom Reservoir were drawn down as far and as often as projected in either the RDEIR/SDEIS modeling or the Spring 2016 modeling, these drawdowns would create recurring serious risks to SJWD’s water supplies, even though SJWD holds

the highest priority appropriative water right in the North Fork of the American River and a settlement contract with the United States that contains no provisions for dry-year reductions.

56. During those projected conditions, SJWD's ability to divert water through Folsom Reservoir's M&I intake and the other facilities used for normal operations would be compromised in 5% of all years (according to the Spring 2016 modeling as depicted in DWR-514) to 10% of all years (according to the RDEIR/SDEIS modeling).
57. Even if the (untested) emergency E-Pump were used once the M&I intake was shut off, as Reclamation proposed to do in 2015, the limited physical capacity of these facilities would interfere with SJWD's ability to access its water supplies. According to Reclamation's "Folsom Drought Emergency Action Plan," see **Exhibit Roseville-16**, the E-Pump can divert only 70 cfs of water to serve both Roseville and SJWD. It is not clear how this 70 cfs would be split between SJWD and Roseville. However, it is clear that the 70 cfs capacity of the E-Pump is 5 cfs lower than the 75 cfs of SJWD's historic senior water rights, which the United States recognized in the 1954 Settlement Agreement. If Reclamation split the 70 cfs evenly between SJWD and Roseville, SJWD would be receiving less than half of what it is entitled to divert under its historic senior water rights.
58. Of course, the extent to which Cal Water Fix would interfere with SJWD's water rights depends on the number and duration of times that the M&I intake would be rendered unusable as a result of the Cal Water Fix project. Since Reclamation and DWR have not produced an operations plan, it is not possible to quantify these impacts precisely at this time. However, if Cal Water Fix drew Folsom Reservoir down to the point where the M&I intake were deemed unsafe and diversions had to be taken through the E-Pump at a rate of 70 cfs, the maximum volume of water that could be delivered in one year for both SJWD and Roseville would be 50,711 acre-feet. (This assumes inflow sufficient to keep Folsom Reservoir's level at or above 309 feet above msl, or 53,858 acre-feet of storage; as noted above, the E-Pump itself cannot be used if the Reservoir drops below that level, and additional emergency measures would have to be implemented to ensure continued deliveries to Roseville and SJWD.)