ORIGINAL

FILED
ENDORSED
2015 JUL -6 AM 10: 13
LEGAL PROCESS #7

KAMALA D. HARRIS
Attorney General of California
TRACY L. WINSOR
GAVIN G. MCCABE
Supervising Deputy Attorneys General
DEBORAH L. BARNES, SBN 124142
MATTHEW G. BULLOCK, SBN 243377
CAROL A.Z. BOYD, SBN 165988
CLIFFORD T. LEE, SBN 74687
MARK W. POOLE, SBN 194520
DANIEL M. FUCHS, SBN 179033
Deputy Attorneys General
1300 I Street, Suite 125
P.O. Box 944255
Sacramento, CA 94244-2550
Telephone: (916) 324-0002
Fax: (916) 327-2319
E-mail: Daniel.Fuchs@doj.ca.gov
Attorneys for Respondents and Defendants State Water Resources Control Board, et al.

Exempt From Filing Fees Under Government Code § 6103

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF SACRAMENTO

THE WEST SIDE IRRIGATION DISTRICT; CENTRAL DELTA WATER AGENCY; SOUTH DELTA WATER AGENCY; WOODS IRRIGATION COMPANY,

Petitioners and Plaintiffs,

v.

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD; THOMAS HOWARD, EXECUTIVE DIRECTOR OF CALIFORNIA STATE WATER RESOURCES CONTROL BOARD; and DOES 1 THROUGH 100, INCLUSIVE.,

Respondents and Defendants.

Case No. 34-2015-80002121

DECLARATION OF LESLIE GROBER IN OPPOSITION TO PLAINTIFFS'/PETITIONERS' EX PARTE APPLICATION FOR TEMPORARY STAY

Hearing Date: July 7, 2015
Time: 9:00 a.m.
Dept: 24
Judge: Hon. Shelleyanne W.L. Chang
Action Filed: June 30, 2015

I, Leslie Grober, declare:

1. I have been an employee of the State Water Resources Control Board (State Water Board) since 2006, and I am currently employed by the State Water Board. Prior to 2006, I worked on water quality monitoring and modeling of the San Joaquin River system for the Central Valley Regional Water Quality Control Board beginning in 1994. I was the manager of the State Water Board's Hearings and Special Programs Section from April 2006 through May 2011. Since May 2011, I have been the Division of Water Rights' Assistant Deputy Director overseeing the Hearings and Special Programs Branch. My priority programs include the State Water Board's San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta) Program, water rights hearings, water quality certifications of hydroelectric projects, and the development of flow objectives for priority tributaries. My number one priority is the review and update of the Bay-Delta Water Quality Control Plan (Bay Delta Plan). I hold a Master of Science degree in hydrologic sciences from the University of California, Davis and a Bachelor of Science degree in geology from the State University of New York in Binghamton. A true and correct copy of my resume is attached as **Exhibit 1**.

2. As part of my responsibility for overseeing the review and update of the Bay Delta Plan, I am responsible for the modeling and review of modeling to assess the effects of changes in hydrology, and Central Valley Project (CVP) and State Water Project (SWP) operations, on Delta water flow and water quality. I and my staff are familiar with Bay-Delta hydrology issues and have worked with modeling staff at the Department of Water Resources and United States Bureau of Reclamation regarding Delta hydrology and water quality.

3. Elevated salinity in the southern Delta is caused by various factors, including low flows; salts imported to the San Joaquin River (SJR) Basin in irrigation water; municipal discharges; subsurface accretions from groundwater; tidal actions; diversions of water by the United States Bureau of Reclamation's (USBR) CVP, and local water users; channel capacity; and discharges from land-derived salts, primarily from agricultural drainage. Salinity in the southern Delta is also affected by evapoconcentration of salts due to local agricultural operations, and, to a lesser extent, by local municipal wastewater treatment plant discharges. Poor flow or

circulation patterns in the southern Delta waterways also cause localized increases in salinity concentrations.

4. The State Water Board established the current southern Delta salinity/electrical conductivity (EC) objectives for the protection of agricultural beneficial uses in the 1978 Delta Plan. The 1978 Delta Plan includes salinity objectives for the protection of agriculture in the southern Delta at four compliance locations including: the SJR at Vernalis, the SJR at Brandt Bridge, Old River near Middle River, and Old River at Tracy Road Bridge. The approach used in developing the objectives involved an initial determination of the water quality needs of significant crops grown in the area, the predominant soil type, and local irrigation practices. In addition, the extent to which these water quality needs would be satisfied under "without project" (without the CVP and SWP) conditions was also considered. The State Water Board based the southern Delta EC objectives on the calculated maximum salinity of applied water (assuming no precipitation) that sustains 100 percent yields of two important salt-sensitive crops grown in the southern Delta (beans and alfalfa) in conditions typical of the southern Delta (surface irrigation of mineral soils) per the University of California Guidelines and Irrigation and Drainage Paper 29: Water Quality for Agriculture of the Food and Agriculture Organization of the United Nations (State Water Board, 1978 Delta Plan, page VI-16 – VI-19). The State Water Board set an objective of 0.7 dS/m during the summer irrigation season (April 1–August 31) based on the salt sensitivity and growing season of beans and an objective of 1.0 dS/m during the winter irrigation season (September 1–March 31) based on the growing season and salt sensitivity of alfalfa during the seedling stage. In the 1978 Delta Plan, the State Water Board found that the most practical solution for long-term protection of southern Delta agriculture was construction of physical facilities to provide adequate circulation and substitute supplies.

5. The State Water Board delayed implementation of the southern Delta salinity objectives pending negotiations by DWR, USBR, and the South Delta Water Agency (SDWA) concerning construction of physical facilities to protect agriculture in the southern Delta (permanent barriers or other devices). Because the negotiations were never completed, the 1991 Bay-Delta Plan provided for a staged implementation of the objectives. The 1991 Bay-Delta Plan

called for implementation of the objectives at Vernalis and Brandt Bridge by 1994 and implementation of the objectives at the two Old River sites by 1996 unless a three-party agreement was reached between DWR, USBR, and SDWA. In the 1995 Bay-Delta Plan, the State Water Board further delayed implementation of the EC objectives for the two Old River sites until December 31, 1997.

6. In State Water Board Decision 1641 (D-1641), the State Water Board authorized a staged implementation of the southern Delta EC objectives. Pursuant to D-1641, USBR was required to meet the Vernalis EC objectives using any measures available. DWR and USBR also were required to meet an EC objective of 1.0 dS/m at Brandt Bridge on the SJR, Old River near Middle River, and Old River at Tracy Road Bridge (the interior southern Delta stations) March–September until April 1, 2005. As of April 1, 2005, D-1641 required that DWR and USBR, through their water right permits and license, meet an EC objective of 0.7 dS/m April–August at the interior southern Delta stations unless permanent barriers were constructed or equivalent measures were implemented to protect southern Delta agriculture along with an operations plan.

7. Since 1991, DWR has installed temporary rock barriers in the southern Delta at three locations to improve water levels, circulation patterns, and water quality in the southern Delta for local agricultural diversion. DWR and USBR were planning to construct permanent physical facilities in the form of permanent operable gates (known as the South Delta Improvements Program) that would have provided better compliance with the objectives. However, the facilities have not been constructed to date, and their construction is unlikely due to endangered species concerns.

8. In his declaration, John Burke describes his analysis of the availability of water at the Woods Diversion point using the DSM2 model. DSM2 is a computer model that can calculate stages, flows, velocities, salinity, and other conditions in the Delta based on certain hydrological inputs. These inputs include the channel geometry of the Delta and time series of inflows, exports, other diversions and return flows, and the salinity of various sources of inflow.

9. According to Mr. Burke, DSM2 model results using 1977, an extreme drought year, show that "with the State and Federal water projects in place and operating normally during the

month of July, 68% of the water comprising Middle River originates from the Sacramento River, 25% from agriculture return flows from the Delta, 5% from the San Joaquin River, and 1 % from San Pablo Bay." By comparison, during July of an average year, water year 1979, and with the State and Federal water projects in place and operating normally, "55% of the water originated from the Sacramento River, 23% from agricultural return flows from the Delta, 18 % from the San Joaquin River, and 4% from miscellaneous tributary inflows."

10. The same source analysis was completed for these two years by Mr. Burke, but with the state and federal projects not releasing any stored water into the Delta or exporting any water that would normally be exported as part of the project. Under these conditions, the DSM2 model shows that "during the month of July, in the 1977 drought year, 39% of the water available in Middle River originates from agricultural return flows from the Delta, 60% from San Pablo Bay Inflow, and 1% from the San Joaquin River." By comparison, during July of an average year, water year 1979, "48% originated from agricultural return flows from the Delta, 51% from San Pablo Bay, and 1% from the San Joaquin River."

11. Also in his declaration, John Burke represents that "both [the West Side Irrigation District] and [the Woods Irrigation Company] are within the boundary of the SDWA and represent significant points of diversion within same" and that "these diversions are representative of other significant points of diversion within the boundaries of [the Central Delta Water Agency]." For purposes of my analysis in this declaration I assume those representations to be accurate.

12. I have not independently duplicated these model results, but the results are consistent with the results that I would expect based on the underlying assumptions and my knowledge of the system. The results show that diversions of either 78 or 150 cfs in the vicinity of Woods Irrigation Company's (Woods) main point of diversion would have little effect on water levels in the immediate vicinity of the diversion, or in other areas of the Delta.

13. In addition to calculating water levels, the DSM2 model can be used to calculate salinity at different locations in the Delta. However, it is not necessary to do so to evaluate Mr.

Burke's model results because a reasonable estimate of salinity can be calculated using the model results already provided by Mr. Burke.

14. I have professionally used the results of DSM2 to assess salinity conditions in the Delta under different flows; Central Valley Project (CVP) and State Water Project (SWP) operations; and CVP and SWP export rates at their pumping facilities in the Delta. Based on my experience using and reviewing DSM2 model results, I know that the salinity results, using DSM2, would not be substantially different from the results obtained by simply applying a reasonable salinity to each component of the mixed water. Much of the complexity of the DSM2 model is centered on the calculation of water elevations, flows, and velocities so that one may determine flow paths and water levels throughout the Delta. The model uses those foundational calculations to also determine the distribution of salt and other constituents. Once the percent contribution of sources is calculated, the mixed salinity can be easily determined.

15. A reasonable salinity to apply for each component of the mixed water is the actual mean monthly salinity of the component recorded for June 2015. Although this value may be slightly different from the actual salinity in July 1977, the month and year used by Mr. Burke to represent drought conditions, any differences would not substantially change the overall conclusions provided here and, in any event it is more accurate to use current data. Furthermore, the DSM2 results for July would not be substantially different from results for June through September because they are representative of a condition where there is little Sacramento or San Joaquin River inflow to substantially change the sources of water available in the Delta under the no-project model runs. As Mr. Burke's analysis in his declaration shows, continued diversion of water present at the Woods' and WSID's points of diversion in the Delta, without the addition of stored water releases, would be comprised in very large percentage of San Pablo Bay water.

16. Current salinity data is available from two DWR websites. A daily and monthly summary of Delta water quality conditions is available at:

http://www.water.ca.gov/swp/operationscontrol/docs/delta/DeltaWQ.pdf

This site has mean daily salinity, recorded in the form of electrical conductivity, for the San Joaquin River near Vernalis, San Joaquin River near Tracy, Martinez, and Terminous. The June

2, 2015 report has data for June 1 through June 30, 2015. (**Exhibit 2**.) The California Data Exchange Center (CDEC) website has mean daily salinity, recorded in the form of electrical conductivity, for the Sacramento River at Georgiana Slough: http://cdec.water.ca.gov/cgi-progs/selectQuery?station_id=GES&sensor_num=100&dur_code=D&start_date=2015-06-01&end_date=2015-06-30&geom

17. Electrical conductivity, or specific conductance, is routinely used as way to measure the ionic content of water and thereby provide a measure of the salinity of water. Common units to measure salinity are milliSiemens per centimeter (mS/cm), which is equivalent also to deciSiemens per meter (dS/m).

18. The mean monthly salinity of the Sacramento River at Georgiana Slough, which is just upstream of the Delta, was 0.15 mS/cm in June 2015. The mean monthly salinity of the San Joaquin River near Vernalis, also just upstream of the Delta, was 0.67 mS/cm in June 2015. The mean monthly salinity for a station representative of miscellaneous tributary inflows from the east side of the Delta, Mokelumne at Terminous, was 0.17 mS/cm. This station may be influenced by Sacramento River water, but in any case, the water from eastside tributaries would tend to have very low salinity, as these data show. (**Exhibit 3**.) These figures are compiled from CDEC and DWR's June 30, 2015 water quality report.

19. Salinity of return flows from the Delta can vary widely, depending, in large part, on the quality of the water that was initially applied. Salinity measurements at Old River near Tracy provide a very conservatively low estimate for the salinity of return flows based on the current salinity of irrigation supply. The mean monthly salinity for the Old River near Tracy was 1.04 mS/cm in June 2015 (**Exhibit 3**). The salinity of returns flows would be substantially higher if the salinity of applied water was higher.

20. The salinity of San Pablo Bay water can also vary widely. During periods of high outflow, salinity in the eastern portions of San Pablo Bay can be close to that of the Sacramento River because all the Bay and seawater is being pushed westward. During periods of low to intermediate flow, however, such as during the current drought, the salinity in San Pablo Bay

approaches that of seawater. Martinez is the site typically used to represent the salinity of water that enters the Delta from San Pablo Bay. It is located in the Carquinez Strait, just west of the Benicia-Martinez, Interstate 680 bridge. The mean monthly salinity at Martinez was 29.73 mS/cm in June 2015 (**Exhibit 3**). Though already high, this is the salinity of the far western Delta when net delta outflow is being maintained at between 3,000 and 6,000 cfs because of the release of stored water. The salinity would be far higher, approaching that of seawater, if Delta outflow were lower. The salinity of seawater, measured as electrical conductivity, is 55 mS/cm (http://www.swrcb.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/3130en.pdf).

21. The salinity for all of these components, other than San Pablo Bay, has little effect on the quality of the mixed supply if a large component of the mixed supply is San Pablo Bay water. The mixed water quality at Woods' point of diversion, under both no-project model runs described in Mr. Burke's declaration, would be 18.25 mS/cm and 15.67 mS/cm for the dry (1977) and normal (1979) year, respectively, assuming San Pablo salinity of 29.73 mS/cm as described in paragraph 20. (**Exhibit 4**)

22. If San Pablo Bay salinity approached that of seawater, 55 mS/cm, the mixed water quality at Woods' point of diversion would be 33.41 mS/cm and 28.56 mS/cm for the dry and normal year, respectively (**Exhibit 5**). Absent releases of stored water, the salinity of San Pablo Bay water is more likely to be closer to that of seawater, 55 mS/cm, than the 29.73 mS/cm it is under the current condition.

23. Furthermore, if water with a salinity higher than 15 mS/cm were actually applied to agricultural lands, agricultural return flows from those lands would be even higher than that. The mixed water quality estimates in **Exhibits 4 and 5** represent low salinity estimates of agricultural return flows (approximately 1 mS/cm) that do not take into account degraded (higher salinity) agricultural water supply salinity, and subsequent degraded agricultural return flow salinity, that would result from continued use of high salinity water. Consideration of this factor would likely increase estimated salinity levels further.

24. **Exhibit 6** is a table of crops and expected crop yields at different salinity levels of applied irrigation water, and **Exhibit 7** is a bar chart showing the salinity level at which zero yield

would be expected for salt tolerant crops. These figures are adapted from Ayes & Wescott, U.N. Food and Agriculture Organization, Water Quality for Agriculture (1994) ch. 2.4.3, Table 4. Most of the crops would suffer 100% crop loss (i.e. 0% yield) at salinity levels higher than 15 mS/cm. Exceptions are barley, cotton, sugarbeets, and date palms. Even these crops, however, would suffer greater than 50% crop loss at salinities greater than 12 mS/cm. These crops represent a tiny fraction of the crop acreage in the Delta. Absent the release of stored water, per Mr. Burke's analysis, the mixed salinity of water in the vicinity of Woods' and WSID's points of diversion would be over 28 mS/cm, which is unsuitable for all crops, and would very likely lead to 100% crop loss even for barley, cotton, sugarbeets, and date palms.

25. Accordingly, although there is water present at all times at the Woods' main point of diversion, in the absence of releases of water from storage upstream, that water would be of a quality unsuitable for agriculture in the month of June, and continuing into July, August, and September, under either no-project scenario analyzed by Mr. Burke in his declaration. The location of WSID's point of diversion on Old River in the southern Delta is not far from the Woods' main point of diversion on Middle River, and is exposed to similar hydrology and mixing of various water sources. The relative contribution of the various sources of water, under the same hydrological conditions, and specifically, with no releases of stored water as modeled by Mr. Burke, would be very similar to that of Woods', and would therefore be a very similar salinity.

26. In addition, the salinity would be high enough to be not just unsuitable in the short term, but if actually applied to crops, is high enough to have long-term negative effects on soil salinity and future crops. Unless applied in amounts far in excess of what are considered reasonable agronomic rates to provide adequate leaching of salts from the root zone, water with salinity in excess of 15 dS/cm would result in residual salinity of water in soils that would affect crop yields in subsequent years.

27. The high salinities that would result in the vicinity of Woods' and WSID's points of diversion in the southern Delta, absent the release of stored water, as modeled by Mr. Burke in his declaration, would also be unsuitable as a source of drinking water. The secondary Maximum

Contaminant Level (MCL) for salinity is 900 µg/L, which is roughly equivalent to an electrical conductivity of 1.4 mS/cm.

28. In the event that salinity levels were, in the absence of releases of stored water, of sufficient quality to yield some crops, based on the rule of water rights priority any water that was of sufficient quality to be useable would be available for diversion by the most senior water rights holders first, whether riparian or appropriative water right holders. The quality of water after senior water right holders are satisfied could reasonably be expected to be lower for junior water right holders under any natural flow conditions.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 3rd day of July, 2015, in Sacramento, California.

LESLIE GROBER

SA2015301195
32130851.doc

EXHIBIT "1"

Leslie F. Grober

2617 Loyola Drive • Davis, California 95618 • 530-756-0147
lesgrober@hotmail.com

Education

University of California, Davis
MS in Hydrologic Sciences, March 1992

State University of New York at Binghamton
BS in Geology, June 1980

Employment History

5/11 to present	SWRCB- DWR, Sacramento	Assistant Deputy Director for Water Rights
4/06 to 5/11	SWRCB- DWR, Sacramento	Environmental Program Manager I
9/00 to 4/06	CRWQCB, CVR, Sacramento	Senior Land and Water Use Scientist
12/98 to 8/00	CRWQCB, CVR, Sacramento	Associate Engineering Geologist
3/94 to 11/98	CRWQCB, CVR, Sacramento	Associate Land and Water Use Analyst
7/88 to 7/93	UC Davis under contract to SWRCB	Post Graduate Researcher
11/80 to 10/85	SOHIO, San Francisco	Geologist

Professional Experience

State Water Resources Control Board (SWRCB), Division of Water Rights

Management

- Assistant Deputy Director for Water Rights (May 2011 to present) and Manager of Hearings and Special Programs Section (April 2006 to May 2011); currently manage 64 technical (scientists, engineers, geologists) and administrative staff, and coordinate their activities with attorneys, Division of Water Quality and Regional Water Quality Control Board staff
- Responsible for the State Water Board's highest priority program: Bay Delta water quality control planning and implementation; also responsible for water rights hearings and Clean Water Act Section 401 water quality certification of Federal Energy Regulatory Commission (FERC) hydropower projects and Army Corp of Engineers Section 404 Permit projects
- Direct staff development and implementation of a comprehensive Strategic Workplan of coordinated State Water Board and Regional Water Quality Control Board Bay Delta activities
- Develop budgets and workplans; develop Budget Change Proposals; oversee management of inter-agency contracts and contractor work conducted under three-party memoranda of understanding
- Develop and oversee development of bill analyses and enrolled bill reports
- Supervise Administrative Support Section which includes responsibility for water rights records (water rights files for the State of California), Statements of Water Diversion and Use (statewide reporting of non-permitted and non-licensed water diversion and use), Division of Water Rights Personnel, and assessment of water rights fees, including data management and development of emergency regulations to fund Water Rights Fund program activities ($17.6 million budget for fiscal year 2012/2013)

Communication

- Present, and oversee presentation of, complex and controversial agenda items to the State Water Board, including Bay Delta planning items, hearings, and water quality certifications; brief State Water Board members on these topics
- Organize and oversee organization of staff meetings on various topics including southern Delta salinity, San Joaquin River flows, and development of Delta flow criteria
- Work cooperatively with state, federal, regional, and local agencies and non-governmental organizations on Bay Delta and FERC water quality certifications; present State Water Board program information to Bay Delta Conservation Plan (BDCP), Delta Stewardship Council, and at other governmental, professional, and technical venues
- Represent State Water Board at directors level meetings for the BDCP, San Joaquin River Flow Settlement, and brief Legislature on Board programs
- Oversee preparation of complex technical documents, including documents prepared pursuant to the California Environmental Quality Act (CEQA)

Technical

- Direct staff and consultants on modeling, and model review efforts including CALSIM, and DSM
- Direct development of State Water Board model alternatives for the BDCP
- Direct staff and consultants on CEQA work products; direct staff review of CEQA and National Environmental Policy Act (NEPA) documents
- Direct and mentor staff on Delta hydrology, and Delta programs, policies, and issues
- Directed, on-time and on-budget, development of Delta flow criteria pursuant to legislative directive

Selected Work Products / Accomplishments

- Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, December 2006
- Strategic Workplan for Activities in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, December 2007
- An Order approving a petition for long-term transfer of up to 200,000 acre-feet of water per year from Yuba County Water Agency to the Department of Water Resources and the United States Bureau of Reclamation, May 2008
- Periodic Review of the 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, August 2009
- Final Report on Development of Flow Criteria for the Sacramento-San Joaquin Delta Ecosystem, August 2010
- Water Quality Certification of the Oroville Hydroelectric Project, December 2010
- Planned and implemented expansion of State Water Board's Delta Program activities, 2011
- Worked collaboratively with state and federal agencies on 204 drought year alternative Delta operations, including Delta drought operations plan
- Currently working to complete Bay-Delta Water Quality Control Plan update and directing Delta tributary instream flow effort

California Regional Water Quality Control Board, Central Valley Region (CRWQCB, CVR)

Management

- Unit Chief of San Joaquin River TMDL Unit: recruit, hire, and train staff; coordinate staff activities and oversee project development and completion
- Develop budgets and workplans for San Joaquin River TMDL development; augment funding through development of interagency agreements with California Bay Delta Authority; develop Budget Change Proposals; oversee management of multi-million dollar inter-agency contracts
- Oversee development of innovative TMDLs for pesticides, salt, selenium, and dissolved oxygen; make staff recommendations to senior management and Regional Board
- Coordinate activities of federal, state, and quasi-governmental agencies and assumed leadership role to facilitate improvement of San Joaquin River water quality; provided impetus for formation of San Joaquin River Water Quality Management Group
- Lead development of resource allocation framework for statewide TMDL program

Technical

- Complete innovative technical Total Maximum Daily Loads (TMDLs) in the San Joaquin River Basin for selenium, salt, dissolved oxygen, pesticides; develop Basin Plan Amendments and control programs using wide range of regulatory tools including waste discharge requirements (WDRs), waivers of WDRs, prohibitions, and water quality certification
- Design and implement a program of real time water quality monitoring and modeling of the San Joaquin River system as part of an inter-agency effort to study impacts of agricultural drainage; design water quality models for the San Joaquin River; train staff on the use of these models; provide water quality modeling support to the Regional and State Water Board on San Joaquin River water quality issues related to agriculture; participate in expert panel review of CalSim model
- Conduct and oversee field investigations, design water quality monitoring programs, perform statistical analyses of data; review and oversee staff review of CEQA and NEPA documents and other technical work and reports of federal, state, and other organizations; design and oversee development of databases

Communication

- Present water quality control programs and make recommendations to State Water Board and Regional Boards
- Present control program implementation strategies and other information on State Water Board and Regional Board programs to professional organizations, conferences, agricultural interests, and stakeholder groups
- Present model results to State Water Board and Regional Boards, agricultural interests, and stakeholder groups
- Present results of water quality analyses and model studies at professional conferences and publish these findings in proceedings and journals

- Author Basin Plan Amendment staff reports that implement TMDLs for selenium, salt, boron, and dissolved oxygen; author technical staff reports on water quality impacts of agricultural drainage
- Testify at State Water Board water rights hearings on San Joaquin River water quality issues
- Work cooperatively with state, federal, and local agencies on SJR water quality issues (CALFED, Grassland Bypass Project, Real Time Management, Salt and Boron Basin Plan Amendment, Selenium, Salt and Boron, and Dissolved Oxygen TMDLs, San Joaquin Valley Drainage Implementation Program)

University of California, Davis under contract to SWRCB

Technical

- Design and code water quality models for the San Joaquin River; use these models to study the effect of irrigation and drainage practices on San Joaquin River water quality
- Document the impacts of agricultural discharges on San Joaquin River water quality using models, resulting in state regulation of these discharges
- Conduct field investigations and collect flow and water quality data; perform statistical analyses of this data

Management

- Coordinate student work assignments at SWRCB
- Coordinate research projects of UC Davis professors and graduate assistants; ensure completion of final reports

Communication

- Present technical results of water quality model analyses to SWRCB
- Author numerous technical reports

Standard Oil of Ohio/ British Petroleum (SOHIO / BP)

Technical

- Investigate frontier areas using remote sensing methods, seismic stratigraphy, log correlation techniques, and computer modeling; conduct onsite analyses as a wellsite geologist in remote areas, including overseas and offshore locations

Management

- Supervise the cataloguing and storage of geophysical data records

Communication

- Author numerous proprietary reports on research of frontier project technical investigations and wellsite activities; present staff recommendations to senior management

EXHIBIT "2"

State of California - Department of Water Resources - Division of Operations & Maintenance - Operations Control Office

Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh
Tuesday, June 30, 2015

Criteria		Standard	Status
Flow/Operational			
% of inflow diverted		35 %	8 %
NDOI, monthly average *		>= 4,000 cfs	4,030 cfs
NDOI, 7 day average*		>= 3,000 cfs	3,244 cfs
Vernalis Base Flow :	Monthly average *	>= 200 cfs	192 cfs
	7 Day average *	>= 160 cfs	150 cfs
Habitat Protection, X2 / Flow		30 days at Collinsville	0 days
		0 day (s) at Chipps Island	0 days
Water Quality			
Days @ CCWD PP#1 w/ chlorides <= 150 mg/l		155 days	124 days
Export Areas for SWP, CVP, CCWD, et al		<= 250 mg/l Cl	173 mg/l
14dm EC at Threemile Slough at Sac		<= 2.78 mS/cm	2.34 mS/cm
14dm EC at Jersey Point		<= 2.20 mS/cm	1.85 mS/cm
14dm EC at San Andreas Landing		<= 0.87 mS/cm	0.61 mS/cm
14dm EC at Terminous		<= 0.54 mS/cm	0.16 mS/cm
Maximum 30 day running average of mean daily EC at:			
Vernalis		<=0.7 mS/cm	0.7 mS/cm
Brandt Bridge		<=0.7 mS/cm	1.0 mS/cm
Old River Near Tracy		<=0.7 mS/cm	1.0 mS/cm
Old River Near Middle River		<=0.7 mS/cm	1.0 mS/cm
SUISUN MARSH:			
Suisun Marsh Salinity Control Gates :		3 Open / 0 Closed / 0 Full Tide Open	
Flashboard Status : Out		Boat Lock Status : Closed	

California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2015)

Previous Month's Index (8RI for Apr): 766 TAF
Sacramento valley water year type index (40/30/30) @ 50%: 4.0 MAF (Critical)
San Joaquin valley water year type index (60/20/20) @ 75%: 0.7 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.
Chlorides (Cl) in milligrams per liter
mht - mean high tides
md - mean daily
14 dm - fourteen day running mean
NR - No Record
NC - Not Computed due to insufficient data
BR : Below Rating
e - estimated value

Montezuma Slough Gate Operation:
Number of gates operating at either Open, Closed, or Full Tide Open
Flashboard Status : In, Out, or Modified In
Boat Lock Status : Open or Closed

Coordinated Operation Agreement Delta Status:
c = excess Delta conditions
b = balanced Delta conditions
r = excess Delta conditions with restrictions:

* NDOI, Rio Vista & Vernalis Flows and Suisun Marsh mhtEC:
- 7 day average is progressive daily mean for the first six days of the month.
- Monthly average is progressive daily mean from the beginning of the month

State of California - Department of Water Resources - Division of Operations & Maintenance - Operations Control Office

Delta Water Quality Conditions

Date	Antioch Tides		Net Delta Outflow Index	Martinez	Port Chicago		Mallard	Chipps Island		Collinsville	
	High	Half	cfs	mdEC	mdEC	14dm	mdEC	mdEC	14dm	mdEC	14dm
06/01/2015	6.51	4.37	3,265	26.98	21.58	20.99	14.63	14.61	14.07	9.93	9.50
06/02/2015	6.47	4.34	4,582	26.57	21.86	20.97	14.30	14.25	14.00	9.79	9.44
06/03/2015	6.55	4.36	3,990	26.95	23.01	21.01	14.53	14.50	13.93	9.70	9.36
06/04/2015	6.56	4.39	4,421	27.00	21.82	20.98	14.01	13.93	13.84	9.68	9.30
06/05/2015	6.65	4.60	4,334	27.71	21.64	21.00	14.86	14.86	13.86	10.61	9.35
06/06/2015	6.61	4.67	4,888	28.04	21.61	21.02	15.19	15.23	13.98	10.97	9.49
06/07/2015	6.27	4.50	4,439	26.65	20.75	21.02	14.38	14.33	14.07	10.17	9.58
06/08/2015	5.95	4.37	5,535	26.06	19.95	21.02	13.40	13.26	14.05	9.23	9.62
06/09/2015	6.13	4.49	4,835	47.20	19.15	20.95	13.96	13.88	14.07	9.67	9.66
06/10/2015	6.05	4.19	4,899	27.71	19.56	20.94	13.05	12.88	14.04	8.94	9.67
06/11/2015	6.44	4.23	5,841	27.77	19.47	20.92	12.83	12.64	14.02	8.58	9.66
06/12/2015	6.64	4.37	5,386	28.49	20.31	20.93	13.85	13.76	14.06	9.36	9.69
06/13/2015	6.84	4.75	4,469	30.87	19.31	20.83	15.32	15.38	14.17	10.84	9.81
06/14/2015	7.14	4.85	4,356	32.38	22.30	20.88	15.84	15.95	14.25	11.46	9.92
06/15/2015	7.09	4.70	3,971	31.57	20.59	20.81	15.58	15.66	14.32	10.87	9.99
06/16/2015	6.88	4.53	3,732	30.90	18.98	20.60	14.57	14.55	14.34	10.46	10.04
06/17/2015	6.72	4.49	3,370	30.59	19.74	20.37	14.49	14.46	14.34	10.39	10.09
06/18/2015	6.60	4.47	3,697	30.65	21.19	20.33	14.76	14.76	14.40	10.37	10.14
06/19/2015	6.37	4.34	3,481	30.25	20.53	20.25	14.32	14.27	14.36	10.06	10.10
06/20/2015	6.12	4.39	3,792	29.48	20.25	20.15	13.81	13.71	14.25	9.78	10.01
06/21/2015	5.87	4.32	3,595	30.19	19.97	20.09	14.18	14.12	14.23	9.91	9.99
06/22/2015	5.50	4.13	3,458	29.29	18.17	19.97	13.31	13.16	14.23	9.23	9.99
06/23/2015	5.68	4.04	3,846	28.21	19.00	19.95	13.03	12.86	14.15	8.83	9.93
06/24/2015	5.88	4.09	3,472	28.31	19.31	19.94	13.33	13.18	14.17	8.86	9.93
06/25/2015	6.07	4.15	3,281	29.04	19.67	19.95	13.76 e	13.65 e	14.25	9.14	9.97
06/26/2015	6.45	4.36	3,271	30.09	21.02	20.00	14.74	14.73	14.32	10.46	10.05
06/27/2015	6.41	4.51	3,126	30.92	22.23	20.21	16.09	16.23	14.38	11.58	10.10
06/28/2015	6.48	4.44	2,962	30.82	20.80	20.10	15.90	16.02	14.38	11.42	10.10
06/29/2015	6.58	4.44	3,113	31.16	21.78	20.19	15.63	15.71	14.39	11.09	10.11
06/30/2015	6.63	4.38	3,484	30.01	19.35	20.22	15.09	15.12	14.43	10.77	10.14

Antioch Tides measured in feet relative to the NAVD88 Datum
Net Delta Outflow Index calculated from equation as specified in D-1641, revised March 2000.
Chipps Island EC calculated from measurements recorded at Mallard Slough.
Electrical Conductivity (EC) units: milliSiemens per Centimeter
md : mean daily
14dm : fourteen day running mean
NR : No Record
NC : Not Computed due to insufficient data
BR : Below Rating
e - estimated value

State of California - Department of Water Resources - Division of Operations & Maintenance - Operations Control Office

Delta Water Quality Conditions

Date	Antioch		Jersey Point		Emmaton		Three Mile Slough		San Andreas Landing		Terminous	
	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm	mdEC	14dm
06/01/2015	5.45	5.38	1.70	1.60	3.49	2.82	2.02	1.69	0.60	0.52	0.17	0.16
06/02/2015	5.76	5.34	1.65	1.59	3.46	2.81	1.93	1.67	0.60	0.52	0.17	0.16
06/03/2015	5.82	5.29	1.72	1.57	3.53	2.80	2.07	1.66	0.63	0.53	0.18	0.16
06/04/2015	5.40	5.21	1.69	1.54	3.39	2.81	2.06	1.65	0.63	0.54	0.18	0.17
06/05/2015	6.21	5.22	1.84	1.55	3.94	2.91	2.23	1.69	0.70	0.55	0.18	0.17
06/06/2015	6.30	5.31	1.99	1.57	4.36	3.07	2.39	1.75	0.69	0.57	0.17	0.17
06/07/2015	5.72	5.37	1.84	1.60	3.83	3.16	2.14	1.81	0.61	0.58	0.17	0.17
06/08/2015	5.33	5.42	1.66	1.62	3.42	3.22	2.03	1.85	0.57	0.58	0.17	0.17
06/09/2015	5.76	5.49	1.65	1.64	3.65	3.29	2.22	1.90	0.65	0.60	0.17	0.17
06/10/2015	5.29	5.52	1.59	1.66	2.96	3.34	1.91	1.93	0.58	0.60	0.18	0.17
06/11/2015	5.19	5.55	1.48	1.67	2.95	3.40	1.77	1.97	0.58	0.61	0.18	0.17
06/12/2015	5.84	5.61	1.68	1.69	3.34	3.47	2.11	2.01	0.60	0.61	0.18	0.17
06/13/2015	6.57	5.71	1.98	1.72	4.06	3.55	2.44	2.08	0.68	0.62	0.18	0.17
06/14/2015	6.73	5.81	2.22	1.76	4.85	3.66	2.91	2.16	0.71	0.63	0.17	0.17
06/15/2015	6.33	5.87	2.08	1.79	4.85	3.76	2.83	2.22	0.70	0.64	0.18	0.18
06/16/2015	6.10	5.90	1.94	1.81	4.48	3.83	2.68	2.27	0.68	0.64	0.18	0.18
06/17/2015	5.99	5.91	1.93	1.83	4.36	3.89	2.55	2.30	0.66	0.65	0.16	0.18
06/18/2015	6.10	5.96	1.78	1.83	4.47	3.97	2.67	2.35	0.62	0.65	0.16	0.17
06/19/2015	5.85	5.93	1.85	1.83	4.28	3.99	2.51	2.37	0.61	0.64	0.16	0.17
06/20/2015	5.71	5.89	1.77	1.82	4.05	3.97	2.45	2.37	0.60	0.63	0.17	0.17
06/21/2015	5.76	5.90	1.78	1.81	4.30	4.00	2.53	2.40	0.58	0.63	0.17	0.17
06/22/2015	5.06	5.88	1.62	1.81	3.60	4.01	2.18	2.41	0.51	0.63	0.17	0.17
06/23/2015	4.94	5.82	1.53	1.80	3.30	3.99	1.95	2.39	0.52	0.62	0.17	0.17
06/24/2015	5.18	5.81	1.55	1.80	3.17	4.00	1.93	2.39	0.57	0.62	0.17	0.17
06/25/2015	5.60	5.84	1.67	1.81	3.06	4.01	1.86	2.40	0.60	0.62	0.17	0.17
06/26/2015	6.35	5.88	1.89	1.83	3.70	4.04	2.04	2.40	0.68	0.62	0.17	0.17
06/27/2015	6.93	5.90	2.21	1.84	4.14	4.04	2.55	2.40	0.69	0.62	0.16	0.17
06/28/2015	6.67	5.90	2.17	1.84	4.31	4.00	2.47	2.37	0.67	0.62	0.15	0.17
06/29/2015	6.43	5.90	2.16	1.85	4.50	3.98	2.57	2.35	0.63	0.62	0.15	0.16
06/30/2015	6.31	5.92	1.99	1.85	4.43	3.98	2.58	2.34	0.60	0.61	0.15	0.16

Electrical Conductivity (EC) units: milliSiemens per Centimeter
Chloride (Cl) units: milligrams per liter
md : mean daily
14dm : fourteen day running mean
NR : No Record
NC : Not Computed due to insufficient data
BR : Below Rating
e : estimated value

State of California - Department of Water Resources - Division of Operations & Maintenance - Operations Control Office

Delta Water Quality Conditions

Date	Bethel Island mdEC	Farrar Park mdEC	Holland Tract mdEC	Bacon Island mdEC	Contra Costa mdEC	Clifton Court mdEC	Tracy Pumping Plant mdEC	Antioch mdCl	Bacon Island mdCl	Contra Costa mdCl	Delta Status
06/01/2015	1.03	1.43	0.87	0.88	0.98	0.81	0.85	1,667	192	206	b
06/02/2015	0.99	1.43	0.87	0.87	0.98	0.81	0.89	1,765	189	207	b
06/03/2015	0.96	1.40	0.85	0.85	0.99	0.82	0.87	1,782	184	209	b
06/04/2015	0.94	1.39	0.84	0.83	0.99	0.83	0.93	1,651	179	211	b
06/05/2015	0.95	1.40	0.84	0.81	0.99	0.84	0.91	1,908	175	211	b
06/06/2015	0.96	1.43	0.83	0.79	0.98	0.82	0.90	1,935	170	211	b
06/07/2015	0.94	1.43	0.82	0.79	0.98	0.83	0.90	1,751	169	210	b
06/08/2015	0.89	1.39	0.82	0.79	0.97	0.83	0.87	1,629	168	209	b
06/09/2015	0.92	1.40	0.82	0.79	0.95	0.86	0.92	1,763	168	208	b
06/10/2015	0.94	1.36	0.81	0.76	0.91	0.83	0.88	1,615	161	204	b
06/11/2015	0.89	1.36	0.76	0.75	0.90	0.84	0.92	1,582	159	196	b
06/12/2015	0.90	1.41	0.81	0.74	0.88	0.82	0.91	1,790	157	191	b
06/13/2015	0.91	1.48	0.81	0.77	0.87	0.82	0.91	2,023	163	188	b
06/14/2015	0.95	1.54	0.81	0.76	0.87	0.81	0.90	2,073	161	184	b
06/15/2015	0.90	1.53	0.79	0.76	0.86	0.80	0.87	1,945	162	184	b
06/16/2015	0.85	1.52	0.79	0.76	0.85	0.80	0.91	1,872	161	182	b
06/17/2015	0.86	1.55	0.80	0.74	0.84	0.80	0.88	1,837	156	178	b
06/18/2015	0.87	1.56	0.79	0.75	0.84	0.79	0.88	1,874	159	178	b
06/19/2015	0.87	1.53	0.79	0.74	0.84	0.78	0.86	1,792	156	178	b
06/20/2015	0.87	1.48	0.78	0.75	0.83	0.78	0.84	1,749	157	177	b
06/21/2015	0.89	1.48	0.78	0.75	0.82	0.77	0.84	1,765	158	175	b
06/22/2015	0.89	1.44	0.75	0.71	0.83	0.77	0.83	1,542	146	174	b
06/23/2015	0.86	1.42	0.75	0.73	0.82	0.76	0.82	1,504	153	175	b
06/24/2015	0.86	1.43	0.75	0.72	0.82	0.77	0.82	1,580	149	175	b
06/25/2015	0.86	1.44	0.76	0.74	0.80	0.77	0.82	1,713	156	174	b
06/26/2015	0.88	1.51	0.78	0.74	0.82	0.77	0.82	1,951	155	173	b
06/27/2015	0.96	1.57	0.77	0.74	0.82	0.76	0.82	2,137	154	174	b
06/28/2015	0.95	1.66	0.77	0.74	0.81	0.76	0.81	2,056	155	172	b
06/29/2015	0.96	1.74	0.77	0.74	0.80	0.75	0.80	1,978	155	174	b
06/30/2015	0.91	1.71	0.77	0.74	0.79	0.76	0.80	1,939	155	173	b

Electrical Conductivity (EC) units: milliSiemens per Centimeter
Chloride (Cl) units: milligrams per liter
md : mean daily
NR : No Record
NC : Not Computed due to insufficient data
BR : Below Rating
e : estimated value
Antioch and Bacon Island mdCl are calculated from the respective mdEC values.

Coordinated Operation Agreement Delta Status:
c = excess Delta conditions
b = balanced Delta conditions
r = excess Delta conditions with restrictions:

State of California - Department of Water Resources - Division of Operations & Maintenance - Operations Control Office

Delta Water Quality Conditions

South Delta Stations

Date	Vernalis		Brandt Bridge		Old River Near Tracy		Old River Near Middle River	
	mdEC	30dm	mdEC	30dm	mdEC	30dm	mdEC	30dm
06/01/2015	0.51	0.52	0.80	0.63	1.02	0.86	0.71	0.67
06/02/2015	0.58	0.53	0.81	0.64	1.01	0.87	0.72	0.68
06/03/2015	0.62	0.53	0.82	0.66	1.03	0.88	0.72	0.68
06/04/2015	0.60	0.54	0.83	0.67	1.02	0.89	0.74	0.69
06/05/2015	0.72	0.55	0.86	0.68	1.01	0.90	0.76	0.69
06/06/2015	0.79	0.56	0.90	0.70	1.03	0.91	0.78	0.70
06/07/2015	0.69	0.56	0.91	0.71	1.02	0.92	0.79	0.70
06/08/2015	0.66	0.57	0.91	0.73	1.02	0.93	0.80	0.71
06/09/2015	0.69	0.58	0.92	0.74	1.03	0.93	0.79	0.71
06/10/2015	0.70	0.59	0.93	0.75	1.02	0.94	0.78	0.71
06/11/2015	0.70	0.60	0.93	0.76	1.02	0.95	0.78	0.72
06/12/2015	0.74	0.61	0.94	0.77	1.02	0.95	0.78	0.72
06/13/2015	0.62	0.61	0.94	0.78	1.04	0.96	0.79	0.72
06/14/2015	0.68	0.62	0.98	0.79	1.04	0.96	0.82	0.72
06/15/2015	0.69	0.62	1.02	0.80	1.06	0.97	0.85	0.73
06/16/2015	0.81	0.63	1.04	0.81	1.03	0.98	0.86	0.73
06/17/2015	0.77	0.64	1.06	0.83	1.02	0.98	0.89	0.74
06/18/2015	0.67	0.65	1.09	0.84	1.00	0.99	0.93	0.75
06/19/2015	0.63	0.65	1.08	0.85	1.01	0.99	1.11	0.76
06/20/2015	0.72	0.66	1.07	0.87	1.01	1.00	1.23	0.78
06/21/2015	0.67	0.66	1.07	0.88	1.00	1.00	1.25	0.80
06/22/2015	0.68	0.66	1.04	0.89	1.02	1.01	1.24	0.82
06/23/2015	0.75	0.67	1.01	0.90	1.04	1.01	1.25	0.84
06/24/2015	0.75	0.67	1.01	0.91	1.11	1.02	1.25	0.86
06/25/2015	0.58	0.67	1.03	0.92	1.29	1.03	1.25	0.88
06/26/2015	0.61	0.67	1.05	0.93	1.12	1.03	1.26	0.90
06/27/2015	0.73	0.67	1.08	0.95	1.07	1.04	1.24	0.91
06/28/2015	0.69	0.67	1.12	0.96	1.01	1.04	1.22	0.93
06/29/2015	0.65	0.67	1.13	0.97	1.01	1.04	1.21	0.95
06/30/2015	0.54	0.67	1.12	0.98	1.02	1.04	1.19	0.97

Electrical Conductivity (EC) units: milliSiemens per Centimeter
md : mean daily
30dm : thirty day running mean
NR : No Record
NC : Not Computed due to insufficient data
BR : Below Rating
e : estimated value

State of California - Department of Water Resources - Division of Operations & Maintenance - Operations Control Office

Delta Water Quality Conditions

Suisun Marsh Stations

Date	Collinvsille	National Steel	Beldon Landing	Sunrise Club	Volanti Slough	Goodyear Slough
	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
06/01/2015	11.02	10.94	9.96	11.66	11.24	15.94
06/02/2015	11.10	9.64	10.12	11.44	11.02	16.26
06/03/2015	11.19	9.97	11.67	11.97	11.81	16.10
06/04/2015	10.76	9.88	12.59	12.42	12.94	16.62
06/05/2015	11.53	10.11	13.30	13.19	13.80	17.38
06/06/2015	12.20	10.14	14.02	13.55	14.40	17.62
06/07/2015	11.22	10.34	14.05	13.81	14.46	17.78
06/08/2015	10.74	10.80	14.56	13.88	14.31	17.96
06/09/2015	11.27	11.13	14.54	14.12	13.62	18.06
06/10/2015	9.91	11.27	14.65	14.12	13.63	18.34
06/11/2015	9.93	11.24	14.95	14.42	13.91	18.47
06/12/2015	10.17	11.23	15.23	14.54	14.80	18.61
06/13/2015	11.55	11.10	15.39	15.13	15.44	18.98
06/14/2015	12.64	11.23	15.74	15.45	15.26	19.64
06/15/2015	11.80	11.39	15.88	15.45	15.25	20.66
06/16/2015	11.11	11.70	16.10	16.21	16.12	20.49
06/17/2015	11.42	11.96	16.79	17.81	16.83	20.19
06/18/2015	11.24	12.10	17.19	17.14	16.15	19.85
06/19/2015	10.64	12.35	17.08	15.83	16.35	19.93
06/20/2015	10.99	12.40	17.14	15.63	16.47	19.89
06/21/2015	11.18	12.48	17.19	15.55	16.96	19.78
06/22/2015	10.58	12.52	16.73	15.21	16.84	19.81
06/23/2015	9.83	12.61	16.66	15.16	16.66	19.95
06/24/2015	10.12	12.65	17.01	15.56	16.57	20.07
06/25/2015	10.23	12.73	17.09	15.57	16.43	19.97
06/26/2015	11.89	12.77	17.10	15.61	16.02	19.88
06/27/2015	11.84	12.77	17.07	15.61	16.45	19.92
06/28/2015	12.59	13.23	16.86	15.58	16.10	20.11
06/29/2015	11.98	13.47	17.05	15.86	16.63	20.20
06/30/2015	11.89	13.56	17.13	16.48	17.09	20.44

Electrical Conductivity (EC) units: milliSiemens per Centimeter
mht : mean high tides
NR : No Record
NC : Not Computed due to insufficient data
BR : Below Rating
e : estimated value

EXHIBIT "3"

Exhibit 3

	Martinez	Mokelumne @ Terminous	Old River @ Tracy	San Joaquin @ Vernalis	Sacramento @ Georgiana Slough
	Eelectircal Conductivity (mS/cm)				
Average	29.73	0.17	1.04	0.67	0.15
Date					
6/1/2015	26.98	0.17	1.02	0.51	0.15
6/2/2015	26.57	0.17	1.01	0.58	0.16
6/3/2015	26.95	0.18	1.03	0.62	0.16
6/4/2015	27.00	0.18	1.02	0.60	0.16
6/5/2015	27.71	0.18	1.01	0.72	0.16
6/6/2015	28.04	0.17	1.03	0.79	0.15
6/7/2015	26.65	0.17	1.02	0.69	0.15
6/8/2015	26.06	0.17	1.02	0.66	0.15
6/9/2015	47.20	0.17	1.03	0.69	0.15
6/10/2015	27.71	0.18	1.02	0.70	0.16
6/11/2015	27.77	0.18	1.02	0.70	0.16
6/12/2015	28.49	0.18	1.02	0.74	0.15
6/13/2015	30.87	0.18	1.04	0.62	0.15
6/14/2015	32.38	0.17	1.04	0.68	0.15
6/15/2015	31.57	0.18	1.06	0.69	0.15
6/16/2015	30.90	0.18	1.03	0.81	0.16
6/17/2015	30.59	0.16	1.02	0.77	0.16
6/18/2015	30.65	0.16	1.00	0.67	0.16
6/19/2015	30.25	0.16	1.01	0.63	0.15
6/20/2015	29.48	0.17	1.01	0.72	0.15
6/21/2015	30.19	0.17	1.00	0.67	0.15
6/22/2015	29.29	0.17	1.02	0.68	0.15
6/23/2015	28.21	0.17	1.04	0.75	0.14
6/24/2015	28.31	0.17	1.11	0.75	0.14
6/25/2015	29.04	0.17	1.29	0.58	0.14
6/26/2015	30.09	0.17	1.12	0.61	0.14
6/27/2015	30.92	0.16	1.07	0.73	0.14
6/28/2015	30.82	0.15	1.01	0.69	0.14
6/29/2015	31.16	0.15	1.01	0.65	0.14
6/30/2015	30.01	0.15	1.02	0.54	0.14

Sources: Data for Sacramento River at Georgianna Slough from CDEC;
Data for all others from DWR WQ Report (6/30/2015)

EXHIBIT "4"

Exhibit 4

Calculation of salinity at Woods (Martinez salinity of 29.73 mS/cm)			
1977 with Projects			
Source	Percent of Source %	Salinity of Source (mS/cm)	mixed EC
Sacramento River (at Georgiana Slough)	68%	0.15	0.10
San Joaquin River (at Vernalis)	5%	0.67	0.03
Delta agricultural return flows (old River at Tracy)	25%	1.04	0.26
Miscellaneous tributaries (Mokelumne at Terminous)		0.17	0.00
San Pablo Bay (Martinez)	1%	29.73	0.30
Total / Average salinty (mS/cm)	**99%**		**0.69**
1979 with Projects			
Source	Percent of Source %	Salinity of Source (mS/cm)	mixed EC
Sacramento River (at Georgiana Slough)	55%	0.15	0.08
San Joaquin River (at Vernalis)	18%	0.67	0.12
Delta agricultural return flows (old River at Tracy)	23%	1.04	0.24
Miscellaneous tributaries (Mokelumne at Terminous)	4%	0.17	0.01
San Pablo Bay (Martinez)		29.73	0.00
Total / Average salinty (mS/cm)	**100%**		**0.45**
1977 without Projects			
Source	Percent of Source %	Salinity of Source (mS/cm)	mixed EC
Sacramento River (at Georgiana Slough)		0.15	0.00
San Joaquin River (at Vernalis)	1%	0.67	0.01
Delta agricultural return flows (old River at Tracy)	39%	1.04	0.41
Miscellaneous tributaries (Mokelumne at Terminous)		0.17	0.00
San Pablo Bay (Martinez)	60%	29.73	17.84
Total / Average salinty (mS/cm)	**100%**		**18.25**
1979 without Projects			
Source	Percent of Source %	Salinity of Source (mS/cm)	mixed EC
Sacramento River (at Georgiana Slough)		0.15	0.00
San Joaquin River (at Vernalis)	1%	0.67	0.01
Delta agricultural return flows (old River at Tracy)	48%	1.04	0.50
Miscellaneous tributaries (Mokelumne at Terminous)		0.17	0.00
San Pablo Bay (Martinez)	51%	29.73	15.16
Total / Average salinty (mS/cm)	**100%**		**15.67**
Note: Percent of source information is from Mr. Burke's declaration; salinity of sources are as shown in exhibit 3			

EXHIBIT "5"

Exhibit 5

Calculation of salinity at Woods (Martinez salinity of 55 mS/cm)			
1977 with Projects			
Source	Percent of Source	Salinity of Source	
	%	(mS/cm)	mixed EC
Sacramento River (at Georgiana Slough)	68%	0.15	0.10
San Joaquin River (at Vernalis)	5%	0.67	0.03
Delta agricultural return flows (old River at Tracy)	25%	1.04	0.26
Miscellaneous tributaries (Mokelumne at Terminous)		0.17	0.00
San Pablo Bay (Martinez)	1%	55.00	0.55
Total / Average salinty (mS/cm)	**99%**		**0.95**
1979 with Projects			
Source	Percent of Source	Salinity of Source	
	%	(mS/cm)	mixed EC
Sacramento River (at Georgiana Slough)	55%	0.15	0.08
San Joaquin River (at Vernalis)	18%	0.67	0.12
Delta agricultural return flows (old River at Tracy)	23%	1.04	0.24
Miscellaneous tributaries (Mokelumne at Terminous)	4%	0.17	0.01
San Pablo Bay (Martinez)		55.00	0.00
Total / Average salinty (mS/cm)	**100%**		**0.45**
1977 without Projects			
Source	Percent of Source	Salinity of Source	
	%	(mS/cm)	mixed EC
Sacramento River (at Georgiana Slough)		0.15	0.00
San Joaquin River (at Vernalis)	1%	0.67	0.01
Delta agricultural return flows (old River at Tracy)	39%	1.04	0.41
Miscellaneous tributaries (Mokelumne at Terminous)		0.17	0.00
San Pablo Bay (Martinez)	60%	55.00	33.00
Total / Average salinty (mS/cm)	**100%**		**33.41**
1979 without Projects			
Source	Percent of Source	Salinity of Source	
	%	(mS/cm)	mixed EC
Sacramento River (at Georgiana Slough)		0.15	0.00
San Joaquin River (at Vernalis)	1%	0.67	0.01
Delta agricultural return flows (old River at Tracy)	48%	1.04	0.50
Miscellaneous tributaries (Mokelumne at Terminous)		0.17	0.00
San Pablo Bay (Martinez)	51%	55.00	28.05
Total / Average salinty (mS/cm)	**100%**		**28.56**
Note: Percent of source information is from Mr. Burke's declaration; salinity of sources are as shown in exhibit 3			

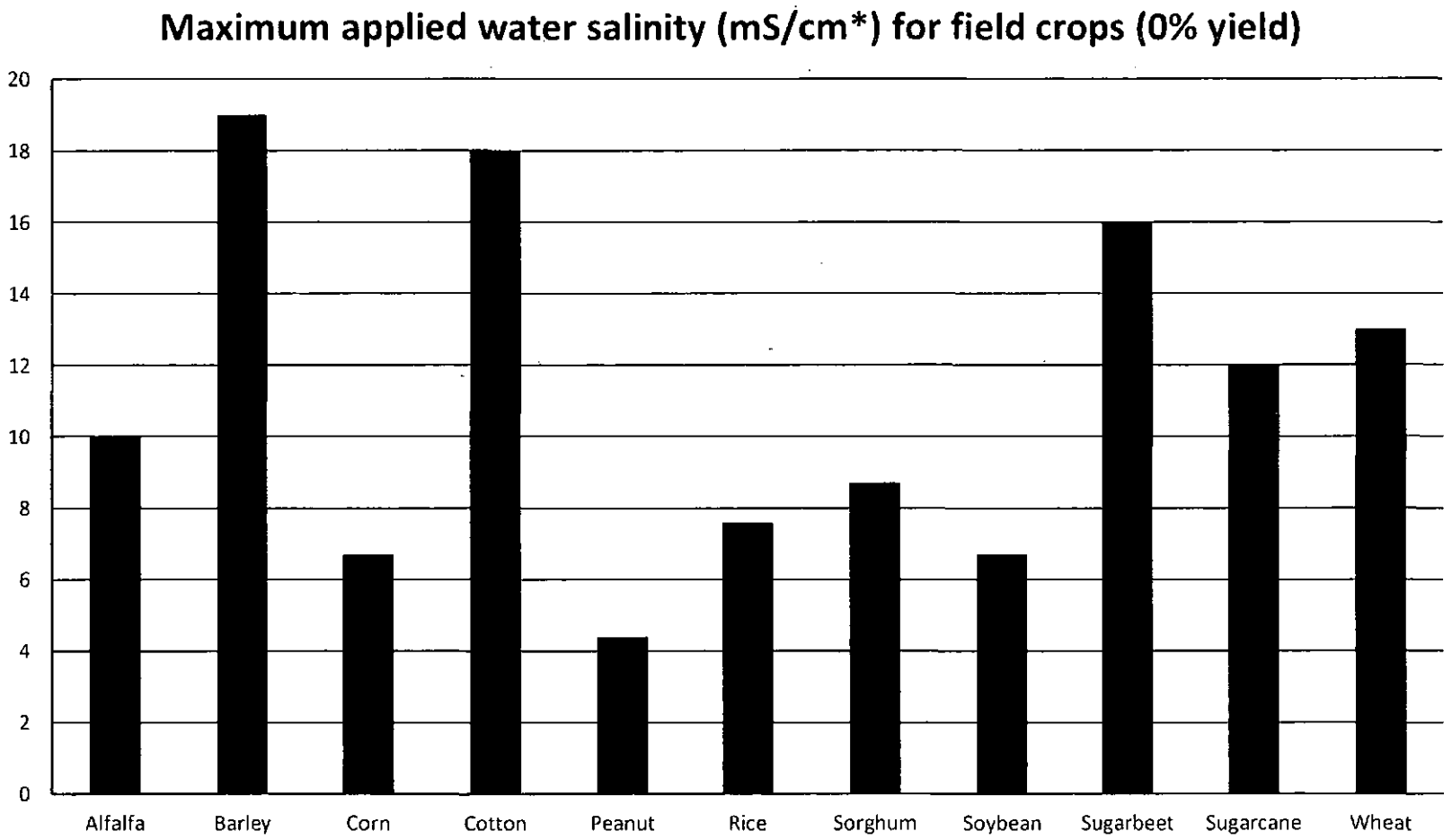
EXHIBIT "6"

Crop yield (%) by various applied water salinity (mS/cm*)						
		Max applied water salinity per percentage yield				
FIELD CROPS	**Linnaean binomial**	**100%**	**90%**	**75%**	**50%**	**0%**
Alfalfa	*Medicago sativa*	1.3	2.2	3.6	5.9	10
Barley	*Hordeum vulgare*	5.3	6.7	8.7	12	19
Corn	*Zea mays*	1.1	1.7	2.5	3.9	6.7
Cotton	*Gossypium hirsutum*	5.1	6.4	8.4	12	18
Peanut	*Arachis hypogaea*	2.1	2.4	2.7	3.3	4.4
Rice	*Oriza sativa*	2	2.6	3.4	4.8	7.6
Sorghum	*Sorghum bicolor*	4.5	5	5.6	6.7	8.7
Soybean	*Glycine max*	3.3	3.7	4.2	5	6.7
Sugarbeet	*Beta vulgaris*	4.7	5.8	7.5	10	16
Sugarcane	*Saccharum officinarum*	1.1	2.3	4	6.8	12
Wheat	*Triticum aestivum*	4	4.9	6.3	8.7	13
VEGETABLES	**Linnaean binomial**	**100%**	**90%**	**75%**	**50%**	**0%**
Bean	*Phaseolus vulgaris*	0.7	1	1.5	2.4	4.2
Beet, red	*Beta vulgaris*	2.7	3.4	4.5	6.4	10
Broccoli	*Brassica oleracea botrytis*	1.9	2.6	3.7	5.5	9.1
Cabbage	*Brassica oleracea capitata*	1.2	1.9	2.9	4.6	8.1
Carrot	*Daucus carota*	0.7	1.1	1.9	3	5.4
Celery	*Apium graveolens*	1.2	2.3	3.9	6.6	12
Cucumber	*Cucumis sativus*	1.7	2.2	2.9	4.2	6.8
Lettuce	*Lactuca sativa*	0.9	1.4	2.1	3.4	6
Onion	*Allium cepa*	0.8	1.2	1.8	2.9	5
Pepper	*Capsicum annuum*	1	1.5	2.2	3.4	5.8
Potato	*Solanum tuberosum*	1.1	1.7	2.5	3.9	6.7
Radish	*Raphanus sativus*	0.8	1.3	2.1	3.4	5.9
Spinach	*Spinacia oleracea*	1.3	2.2	3.5	5.7	10
Squash, scallop	*Cucurbita pepo melopepo*	2.1	2.6	3.2	4.2	6.3
Squash, zucchini	*Cucurbita pepo melopepo*	3.1	3.8	4.9	6.7	10
Sweet potato	*Ipomoea batatas*	1	1.6	2.5	4	7.1
Tomato	*Lycopersicon esculentum*	1.7	2.3	3.4	5	8.4
Turnip	*Brassica rapa*	0.6	1.3	2.5	4.3	8
FRUITS & NUTS	**Linnaean binomial**	**100%**	**90%**	**75%**	**50%**	**0%**
Almond	*Prunus dulcis*	1	1.4	1.9	2.8	4.5
Apricot	*Prunus armeniaca*	1.1	1.3	1.8	2.5	3.8
Blackberry	*Rubus sp.*	1	1.3	1.8	2.5	4
Date palm	*Phoenix dactylifera*	2.7	4.5	7.3	12	21
Grape	*Vitus sp.*	1	1.7	2.7	4.5	7.9
Grapefruit	*Citrus paradisi*	1.2	1.6	2.2	3.3	5.4
Orange	*Citrus sinensis*	1.1	1.6	2.2	3.2	5.3
Peach	*Prunus persica*	1.1	1.5	1.9	2.7	4.3
Plum, prune	*Prunus domestica*	1	1.4	1.9	2.9	4.7
Strawberry	*Fragaria sp.*	0.7	0.9	1.2	1.7	2.7

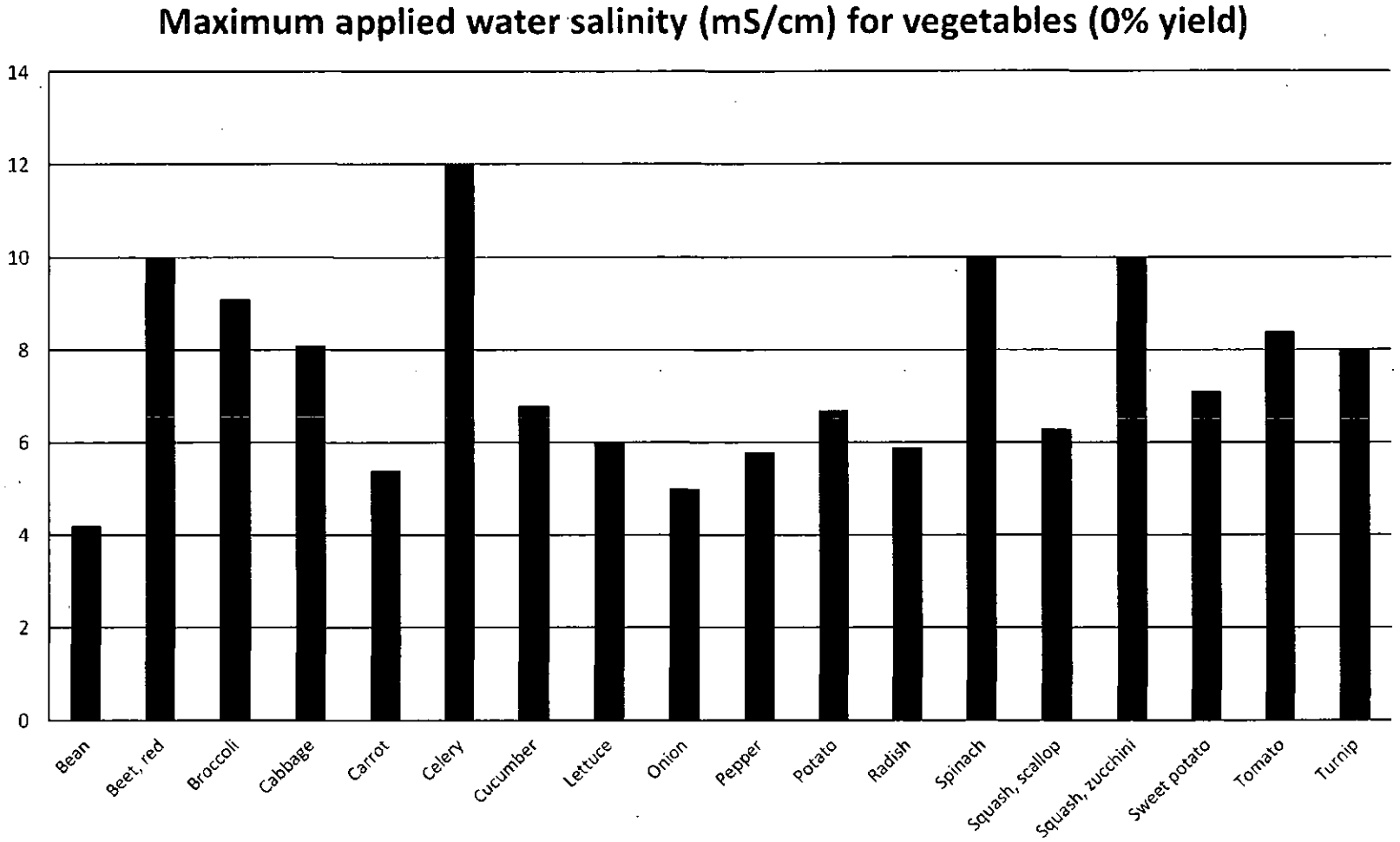
Adapted from Ayes & Wescott, U.N. Food and Agriculture Organization, Water Quality for Agriculture (1994) ch. 2.4.3, Table 4

*Milli-Siemens per centimeter

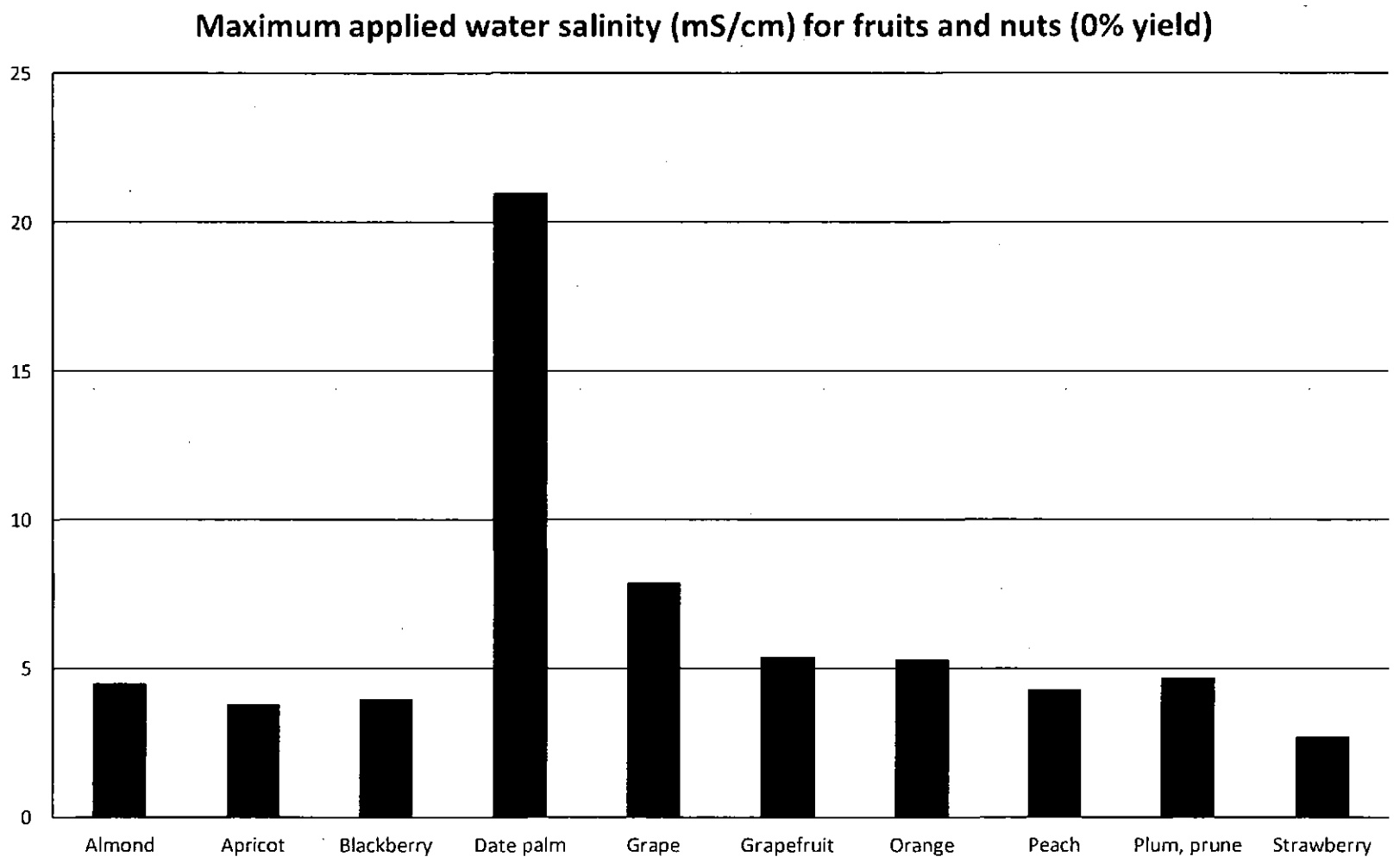
EXHIBIT "7"



Adapted from Ayes & Wescott, U.N. Food and Agriculture Organization, Water Quality for Agriculture (1994) ch. 2.4.3, Table 4
*Milli-Siemens per centimeter



Adapted from Ayes & Wescott, U.N. Food and Agriculture Organization, Water Quality for Agriculture (1994) ch. 2.4.3, Table 4
*Milli-Siemens per centimeter



Adapted from Ayes & Wescott, U.N. Food and Agriculture Organization, Water Quality for Agriculture (1994) ch. 2.4.3, Table 4
*Milli-Siemens per centimeter

DECLARATION OF SERVICE BY U.S. MAIL & ELECTRONIC MAIL

Case Name: ***The West Side Irrigation District, et al. v. California State Water Resources Control Board, et al.***

Case No.: **34-2015-80002121**

I declare:

I am employed in the Office of the Attorney General, which is the office of a member of the California State Bar, at which member's direction this service is made. I am 18 years of age or older and not a party to this matter. I am familiar with the business practice at the Office of the Attorney General for collection and processing of correspondence for mailing with the United States Postal Service. In accordance with that practice, correspondence placed in the internal mail collection system at the Office of the Attorney General is deposited with the United States Postal Service with postage thereon fully prepaid that same day in the ordinary course of business.

On July 6, 2015, I served the attached ***Declaration of Leslie Grober in Opposition of Plaintiffs'/Petitioners Ex Parte Application for Temporary Stay*** by placing a true copy thereof enclosed in a sealed envelope, in the internal mail system of the Office of the Attorney General, addressed as indicated below. In addition, I also transmitted a true copy via electronic mail as indicated below:

Steven A. Herum
Jeanne M. Zolezzi
Karna E. Harrigfeld
Herum Crabtree Suntag, P.C.
5757 Pacific Avenue, Suite 222
Stockton, CA 95207
E-Mail: sherum@herumcrabtree.com

Attorneys for Petitioner
The West Side Irrigation District

I declare under penalty of perjury under the laws of the State of California the foregoing is true and correct and that this declaration was executed on July 6, 2015, at Sacramento, CA.

L. Carnahan
Declarant

L. Carnahan
Signature

SA2015301195
32131623.doc