

Application for Federal Assistance SF-424

* 1. Type of Submission:

- Preapplication
 Application
 Changed/Corrected Application

* 2. Type of Application:

- New
 Continuation
 Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received:

06/25/2015

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name:

Stockton East Water District

* b. Employer/Taxpayer Identification Number (EIN/TIN):

90-0036995

* c. Organizational DUNS:

0661228540000

d. Address:

* Street1:

6767 E. Main Street

Street2:

* City:

Stockton

County/Parish:

San Joaquin

* State:

CA: California

Province:

* Country:

USA: UNITED STATES

* Zip / Postal Code:

95215-1527

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:

* First Name:

Cathy

Middle Name:

* Last Name:

Lee

Suffix:

Title:

Organizational Affiliation:

* Telephone Number:

2094443119

Fax Number:

2099484219

* Email:

clee@sewd.net

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

D: Special District Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Bureau of Reclamation

11. Catalog of Federal Domestic Assistance Number:

15.514

CFDA Title:

Reclamation States Emergency Drought Relief

*** 12. Funding Opportunity Number:**

R15AS00046

* Title:

WaterSMART: Drought Resiliency Project Grants for Fiscal Year 2015

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment

Delete Attachment

View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Southeast Groundwater Recharge Basin
North Site Groundwater Recharge Basin Project

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant

* b. Program/Project

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment

Delete Attachment

View Attachment

17. Proposed Project:

* a. Start Date:

* b. End Date:

18. Estimated Funding (\$):

* a. Federal	<input type="text" value="300,000.00"/>
* b. Applicant	<input type="text" value="546,453.10"/>
* c. State	<input type="text" value="0.00"/>
* d. Local	<input type="text" value="0.00"/>
* e. Other	<input type="text" value="0.00"/>
* f. Program Income	<input type="text" value="0.00"/>
* g. TOTAL	<input type="text" value="846,453.10"/>

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

a. This application was made available to the State under the Executive Order 12372 Process for review on

b. Program is subject to E.O. 12372 but has not been selected by the State for review.

c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

Yes No

If "Yes", provide explanation and attach

Add Attachment

Delete Attachment

View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: * First Name:

Middle Name:

* Last Name:

Suffix:

* Title:

* Telephone Number: Fax Number:

* Email:

* Signature of Authorized Representative: * Date Signed:

BUDGET INFORMATION - Construction Programs

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
2. Land, structures, rights-of-way, appraisals, etc.	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
3. Relocation expenses and payments	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
4. Architectural and engineering fees	\$ <input type="text" value="166,000.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="166,000.00"/>
5. Other architectural and engineering fees	\$ <input type="text" value="8,143.10"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="8,143.10"/>
6. Project inspection fees	\$ <input type="text" value="24,000.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="24,000.00"/>
7. Site work	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
8. Demolition and removal	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
9. Construction	\$ <input type="text" value="648,310.00"/>	\$ <input type="text"/>	\$ <input type="text" value="648,310.00"/>
10. Equipment	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
11. Miscellaneous	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
12. SUBTOTAL (sum of lines 1-11)	\$ <input type="text" value="846,453.10"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="846,453.10"/>
13. Contingencies	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
14. SUBTOTAL	\$ <input type="text" value="846,453.10"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="846,453.10"/>
15. Project (program) income	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
16. TOTAL PROJECT COSTS (subtract #15 from #14)	\$ <input type="text" value="846,453.10"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="846,453.10"/>
FEDERAL FUNDING			
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter eligible costs from line 16c Multiply X <input type="text" value="35"/> % Enter the resulting Federal share.			\$ <input type="text" value="296,258.58"/>

ASSURANCES - CONSTRUCTION PROGRAMS

OMB Number: 4040-0009
Expiration Date: 06/30/2014

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0042), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure non-discrimination during the useful life of the project.
4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progressive reports and such other information as may be required by the assistance awarding agency or State.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards of merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
10. Will comply with all Federal statutes relating to non-discrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681 1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333) regarding labor standards for federally-assisted construction subagreements.
14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq).
18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.
20. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL Cathy Lee	TITLE General Manager
APPLICANT ORGANIZATION Stockton East Water District	DATE SUBMITTED 06/25/2015

SF-424D (Rev. 7-97) Back



Stockton East Water District

6767 E. Main Street, Stockton
San Joaquin County, California

GRANT PROPOSAL

Southeast Recharge Basin

North Site Groundwater Recharge Basins Project



Funding Opportunity Announcement No. R15AS00046

Drought Resiliency Project Grants for FY 2015

Drought Response Program

U.S. Department of Interior, Bureau of Reclamation

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Acronyms and Abbreviations

AF	acre-feet
AF/Y	acre-foot per year
CCWD	Calaveras County Water District
CEQA	California Environmental Quality Act
County	San Joaquin County
CSJWCD	Central San Joaquin Water Conservation District
CVP	Central Valley Project
District	Stockton East Water District
DWR	California Department of Water Resources
Farmington Study	Farmington Groundwater Recharge Seasonal Habitat Study
ft	feet
ft/day	feet/day
IS/ND	Initial Study/Negative Declaration
M&I	Municipal and Industrial
MGD	million gallons per day
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
North Site	North Site Groundwater Recharge Basins
Program	Farmington Groundwater Recharge Program
Reclamation	United States Bureau of Reclamation
SJMSCP	San Joaquin Multi-Species Habitat Conservation and Open Spaces Plan
SWRCB	State Water Resources Control Board
SWPPP	Storm Water Pollution Prevention Plan
SEWD	Stockton East Water District
UCs	Urban Contractors
USACE	U.S. Army Corps of Engineers
WTP	Water Treatment Plant

SECTION I REQUIRED FORMS

The proposed Southeast Groundwater Recharge Basin project includes construction, therefore, the forms used are:

- SF 424 Application for Federal Assistance
- SF 424 C Budget Information – Construction Programs
- SF 424 D Assurances – Construction Program

The forms are attached as Appendix A, Required Forms.

SECTION II TECHNICAL PROPOSAL AND EVALUATION

CRITERIA

20 pages limit for this section

Executive Summary

Stockton East Water District (SEWD or the District) is pleased to submit this grant proposal for the Southeast Recharge Basin project on June 25, 2015 to the Bureau of Reclamation for the Drought Resilience Project Grant for Fiscal Year 2015. Stockton East Water District is located at 6767 E. Main Street, near the City of Stockton, in San Joaquin County, California.

The District has successfully operated the Farmington Groundwater Recharge Program (Farmington Program) since 2003. The goal of the Farmington Program is to directly recharge surface water into the Eastern San Joaquin Groundwater Basin (Groundwater Basin) through recharge ponds. The Groundwater Basin has been in decline on an average of 1.7 feet per year for half a century with some areas dropping to 100 feet below historic levels. The District's proposed 60-acre Southeast Recharge Basin project is to expand the concept of Farmington Program by developing additional recharge basins on lands currently owned by the District. Excess surface water from normal and wet years would be stored in the ponds to recharge the groundwater and would later be extracted and treated for municipal (potable) supplies in dry years. The proposed Southeast Groundwater Recharge Basin project, would be constructed by Fall 2016 and ready to receive any excess water the following winter. The development of the additional recharge basin would expand the volume of surface water being recharged to the overdrafted groundwater basin allowing sustainable conjunctive use, deterring salt water intrusion, increasing the reliability of water supply, and therefore, helping the District to be more resilient for the future impacts of droughts and climate change.

Background Data

SEWD is a public agency providing water supplies to both agricultural and urban customers within its service area. Since the 1940's, the District's primary charge is to secure additional surface water supplies in order to correct the severe groundwater overdraft problem within its service area. By providing surface water for agricultural irrigation, the District supports the County's agricultural industry, which is the area's leading economic activity. The District is the Water Master on the Calaveras River system below the New Hogan Dam. The District works with the U.S. Army Corps of Engineers (USACE) to determine the amount of releases from the New Hogan Dam for supply to growers in the Calaveras River system.

SEWD also supplies wholesale treated surface water for municipal and industrial (M&I) purposes to 300,000 people in the greater Stockton area through the City of Stockton, California Water Service – Stockton District, and San Joaquin County, collectively referred to as the Urban

SOUTHEAST RECHARGE BASINS
STOCKTON EAST WATER DISTRICT

Contractors (UCs). The proposed project would be a water supply reliability program benefitting the UCs by providing groundwater as a backup water supply when surface water is not available. A map showing the District location in relation to the City of Stockton is show in Figure 1 below:

Surface Water Supply and Water Rights

The District has two sources of surface water supply, the New Hogan Reservoir and the New Melones Reservoir.

New Hogan Reservoir

The District was formed in 1948 under the 1931 Water Conservation Act of the State of California. From 1948 to 1963, the District focused its efforts on water resource planning by

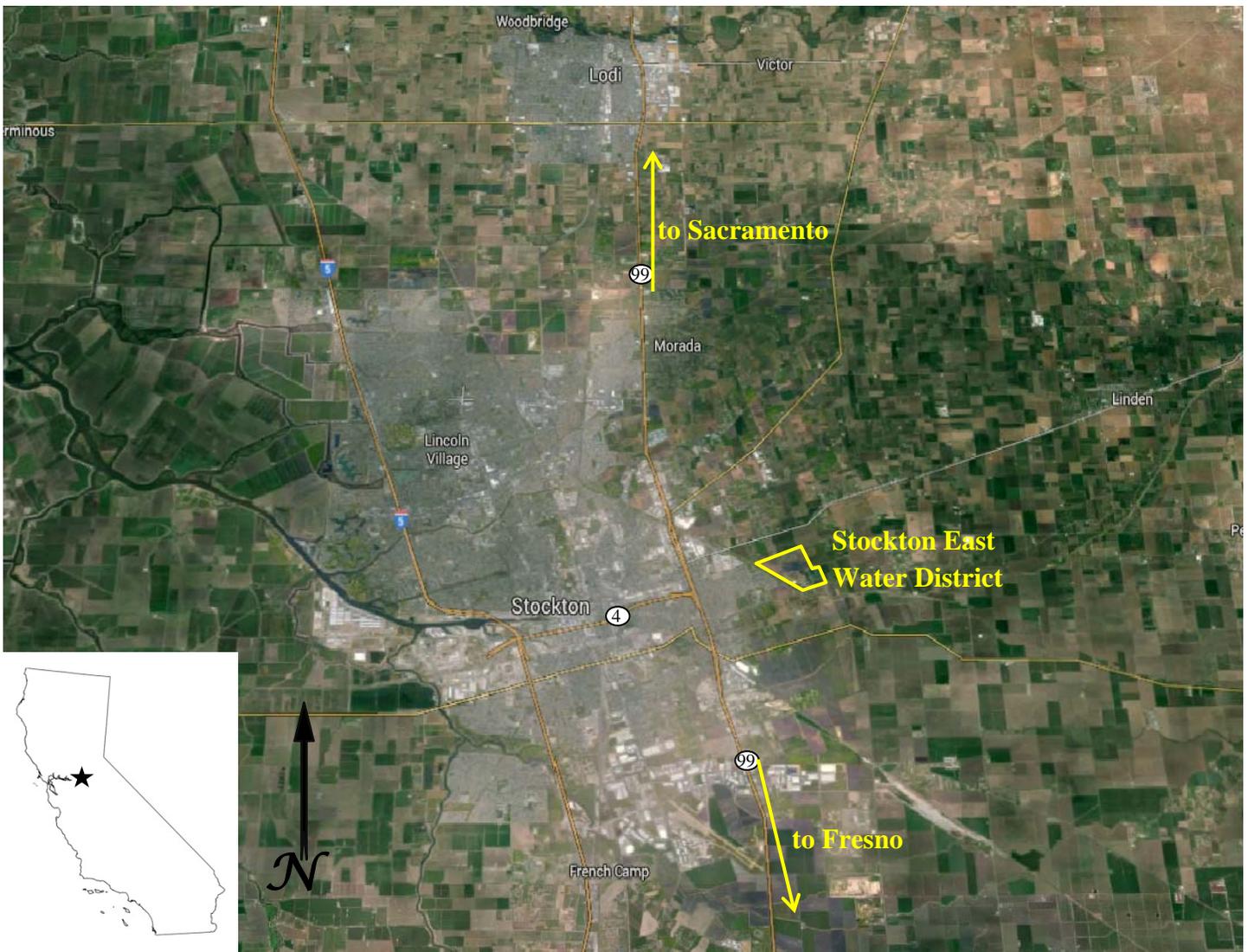


Figure 1 SEWD Vicinity Map

evaluating groundwater conditions and determining requirements for supplemental water. These intensive efforts on the part of the District and other local agencies resulted in the construction of New Hogan Dam in 1964 on the Calaveras River system. The District's first supply of supplemental surface water was obtained through a contract with the United States Bureau of Reclamation (Reclamation) in 1964, and a final agreement, which guaranteed 56.5% of New Hogan Reservoir's yield to the District, was put in place between the District and the Calaveras County Water District (CCWD) in 1970.

New Hogan Dam and Reservoir are located on the Calaveras River approximately 28 miles east of Stockton. The New Hogan Reservoir provides water storage for flood control, municipal and industrial water supply, irrigation and recreation. The maximum capacity of New Hogan Reservoir is 317,000 acre-feet (AF). The average long-term conservation yield to the District and CCWD is approximately 84,100 acre-feet per year (AF/Y).

Under the original 1970 contract with CCWD, SEWD's supply is 56.5% of the project water. Under normal year conditions this is approximately 40,341 AF/Y. In addition, the District is entitled to 12,650 AF/Y in recognition of senior water rights of individual landowners in the District. The total supply available to the two districts is 84,100 AF/Y in normal water years, of which a maximum of 80,000 AF/Y has been available to the District.

The 1970 Contract was modified by a 1982 Memorandum of Understanding (MOU) between SEWD and CCWD to maximize yield by taking the water when it is available. This practice results in little or no water being available in dry years. Under contract, the District is entitled to all the available project supply not used by CCWD. At the current level of CCWD use, the District can rely on about 83,000 AF/Y of regulated Calaveras River water supply for percolation and surface delivery in normal water years. If CCWD maintains its percentage entitlement (43.5%) and exercises it, SEWD's share will be reduced.

As previously stated, the District is the Water Master for the Calaveras River. The District coordinates with the USACE to determine the amount of releases from the New Hogan Dam for CCWD and supply to growers. The District monitors and tracks the water uses by the growers based on their river pump readings.

New Melones Reservoir

In 1983, the District contracted with USBR for allocations of 75,000 AF/Y from New Melones Reservoir on the Stanislaus River. Water allocations are based on the March-September water inflow forecast and the February end of month storage in New Melones each year. The District has previously experienced difficulty in obtaining water pursuant to its water supply contract with Reclamation for New Melones water. The water allocation to the District has been reduced

for fish and wildlife enhancement. The District will receive a full allocation on all but dry years based on inflow to New Melones as previously described. The District received received 55% of its allocation in 2014 but did not receive any allocation in 2015. The District is a permanent Central Valley Project (CVP) East Side Water Contractor of Reclamation.

Water Treatment

In 1976 the District began construction of the Dr. Joe Waidhofer Drinking Water Treatment Plant (WTP) which was operational in 1977. Prior to the completion of the WTP, the greater Stockton area relied solely on groundwater for M&I supplies. The WTP had an initial capacity of 30 million gallons per day (MGD) and expanded to 40 MGD in 1991 and to 65 MGD in 2006 to accommodate increased growth and demand from Stockton's urban areas. The WTP uses conventional water treatment processes, including flocculation, sedimentation, filtration, and disinfection, prior to deliver the treated water to the UCs. Each urban contractor maintains its own distribution system.

Raw water sources for the WTP include supplies from both New Hogan Reservoir (Calaveras River system) and New Melones Reservoir (Stanislaus River system). Calaveras River water from New Hogan Reservoir is diverted at Bellota and transported through a 13-mile long, 54-inch diameter pipeline (Bellota pipeline) to the WTP. New Melones water is diverted at Goodwin Dam through the New Melones conveyance system. The New Melones conveyance system consists of a 3-mile tunnel; 10 miles of Upper Farmington Canal; 14 miles of existing creeks, Shirley, Hoods, Rock; 10 miles of Lower Farmington Canal; 3 miles of 78-inch pipeline (Peters pipeline) connecting to the Bellota 54-inch pipeline and a new 60-inch pipeline (Peters pipeline) about 6 miles from the WTP.

Groundwater

San Joaquin County is located at the northern end of the San Joaquin Valley between the Sacramento-San Joaquin River Delta and the Sierra Nevada foothills. Land uses in the area include urban areas in the cities of Stockton and Lodi and vast agricultural areas to the east.

Measurements over the past 50 years reveal a fairly continuous decline in groundwater levels in Eastern San Joaquin County. Water supplies for agricultural and M&I uses historically have been, and remain, heavily dependent on groundwater. The Eastern San Joaquin Groundwater Basin has seen groundwater decline on an average of 1.7 feet per year for half a century with some areas dropping to 100 feet below historic levels. The most severe areas of groundwater overdraft are in the northeastern portion of San Joaquin County. Long-term overdraft has resulted in an extensive area of depressed groundwater levels that draws groundwater toward the depression from all directions. By the mid-1960s a large pump depression had formed below the City of Stockton. This lowering of the groundwater table below sea level induced the movement of saline water from deposits under the Delta to the western portion of the aquifer below the City

of Stockton. As a result, elevated salinity and dissolved solids levels rendered the water to be unsuitable for continuous municipal supply purposes.

By the late 1970s, the center of groundwater extraction began shifting to areas east of the City of Stockton. This shift in the location of the groundwater depression occurred in part because surface water supplies from New Hogan Reservoir replaced a portion of the groundwater pumping in the western portion of Stockton. In addition, agriculture that is completely dependent on groundwater developed in the eastern portion of the county.

During the past 30 years, a portion of the water supply for M&I and agricultural demands has been met with surface water from the Calaveras and Stanislaus rivers. Since 1994, CVP water supplies of up to about 50,000 AF/Y and water pursuant to the Oakdale Irrigation District and South San Joaquin Irrigation District water transfer agreement have been made available from the Stanislaus River for agricultural and urban uses in the Eastern San Joaquin area. However, the amount of reliable surface water from the Calaveras and Stanislaus rivers has not been sufficient to correct the groundwater overdraft problem. As compared to conditions during the 1970s, recent groundwater levels are approximately 10 feet higher in the western portion of Stockton and a groundwater mound has formed below the diverting canal that divides the overdraft area from saline water.

In 1963, the Governor of California signed a bill establishing the District's right to levy groundwater use fees and surface water charges. About this time, SEWD began registering wells within the District, while check dams were built on the Calaveras River, Mormon Slough and Mosher Slough to control surface irrigation water and promote groundwater recharge. The District also became actively involved in the pursuit of projects to mitigate significant groundwater issues, which included declining aquifer levels, pumping depressions under urban Stockton, and the continuing threat of saline intrusion in wells near the Delta.

Groundwater Recharge

In 1997, the District and the United States Army Corps of Engineers (USACE), in a cost-share agreement, have created the Farmington Groundwater Recharge Program (Farmington Program) with the intent of replenishing the aquifer to help insure future groundwater supply and protect against further saltwater intrusion. The goal of the Farmington Program is to primarily benefit the groundwater basin and enhance habitats. As the program is implemented, local groundwater availability and quality will also improve as aquifer levels stabilize. The Farmington Program aims to obtain 25 to 30 parcels of land, totaling 1,200 acres, for directly recharging surface water to the groundwater aquifer. It is estimated that the development of these parcels into recharge areas may return approximately 35,000 AF/Y of water into the overdrafted groundwater basin in eastern San Joaquin County.

As part of the Farmington Program, the Farmington Groundwater Recharge/Seasonal Habitat Study (Farmington Study) was a cost-shared study in 2001 by the USACE and a group of local sponsors that included SEWD, Central San Joaquin Water Conservation District (CSJWCD), North San Joaquin Water Conservation District (NSJWCD), City of Stockton, San Joaquin County, and the California Water Service Company. The study evaluated groundwater recharge and habitat restoration opportunities and alternatives for developing a multi-purpose groundwater recharge and habitat project within in the service areas of SEWD, CSJWCD, and NSJWCD. The study focused on where and how recharge could be accomplished on a regional basis and described opportunities for integrated seasonal habitat development.

The Farmington Study concluded that the opportunity exists to recharge excess surface water available during both the flood season and the irrigation season. Available and potentially available supplies include flood season releases from New Melones, New Hogan, Farmington Dam, and unused irrigation supplies from the Calaveras and Stanislaus Rivers. Recharging excess water will help alleviate groundwater overdraft and reduce the rate of saline water intrusion while maintaining current supplies.

Since 2003, the District operates a 60-acre recharge site as a result of the Farmington Program. The recharge facility consists of two 15-acre recharge ponds with earthen berms, one 5-acre overflow pond, and one 19-acre dual purpose storage/recharge pond with a capacity of 60-million gallons for a total active recharge area of 49 acres, about 80% of the 60-acre site. Water is gravity fed into the recharge ponds until a sufficient head is developed to regulate percolation. District staff routinely checks and records the water levels, documents any issues associated with operations, monitors associated monitoring wells and piezometers for groundwater levels, and maintains the ponds for any vector nuisance. While in recharge operation, the site's performance has been closely monitored and recorded. Since 2003, the observed range of recharge ranges from 2,789 AF/Y to 5,825 AF/Y with an average of 4,400 AF/Y. Figure 2 depicts the 60-acre recharge site the District is currently operating.



Figure 2 Current 60-acre recharge site

Technical Project Description

Spreading basins are ponds excavated to relatively shallow depths through low permeability soils and/or through shallow hardpan typically to depths less than 5 feet (ft) below ground surface. Shallow spreading basins are commonly used in large-scale applications, such as those in the southern San Joaquin Valley, southern California, and Arizona. Spreading basins provide surcharge capacity to accept peak flows, provide efficient conveyance of water through a recharge project, and are applicable in a variety of geologic conditions. At sites where shallow vertical impediments, such as organic clay soils or a thin veneer of hardpan are present, the construction of shallow basins can remove or reduce the effect of these materials thereby increasing infiltration effectiveness.

The future build-out of the District's North Site Groundwater Recharge Basins Program (North Site) would include a 230 acre parcel recently purchased by the District in addition to the existing 60-acre recharge site. The North Site, shown in Figure 3 is bordered by the Stockton Diverting Canal to the west, SEWD property to the south, and agricultural orchards to the north and east. Since 1989, the site has been used for agricultural purposes. Primary crops include corn, asparagus, and tomatoes. The proposed project site is generally flat and currently being used for active farming by the District contract farm operator. The surrounding land is rural and used primarily for agriculture. The regional surface slope in the vicinity of the site is generally flat with a gradient of about 0.001 to the southwest.

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The proposed Southeast Recharge Basins project would include design and construction of a 60-acre spreading basin on the southeast corner of the North Site. About 80% of the site would be used as spreading basins and the remaining site area would be used for berms, access, and related appurtenances. Based on prior studies and data collected from the Farmington Program and the current 60-acre recharge facility, a long term-infiltration rate of 0.45 ft/day is assumed. This infiltration rate is used for potential variation throughout a large site, sediment accumulation overtime, algae growth, and maintenance activities associated with cleaning the ponds.

Typically, recharge basin design criteria include water depth, soil moisture rates, compaction rates, hydraulic conductivity, and operational parameters to optimize recharge capacity. Operations of the basin should include plugging maintenance, drainage considerations, and



Figure 3 Proposed Southeast Recharge basin and North Site Recharge Basins Project

groundwater level monitoring. The design phase of the project would include field investigation and detailed design. The objective of the field investigation is to understand the underlying soil for construction design and for future operation and maintenance. Field investigation activities would include hardpan presence and size (if any), soil information, field check/verification for sensitive biological or previous contamination activities, and other activities deemed necessary by the engineer. The design phase would include detailed design including specifications and drawings.

It is expected that construction activities would be completed between May and October of the first year and would include:

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1. Construction of a staging area for equipment and material storage,
2. Installation of temporary fencing, chain link fencing, and gates,
3. Clearing and grubbing,
4. Construction of monitoring wells,
5. Site grading,
6. Excavation for structures,
7. Installing water conveyance system of about 50 feet of 24-inch diameter and 50 feet of 12-inch diameter pipeline,
8. Constructing berms and weirs between cells (if necessary) with excavated material from cells,
9. Constructing the recharge cell areas into either ridges or trenches layouts,
10. Finish grading,
11. Constructing bank stabilization to prevent erosion, and
12. Installation of various pipe, valves, and gates.

Recharge activities would include:

1. Diverting water from the District's existing raw surface water conveyance system, with pipelines currently in place on the eastern and southern boundaries of the proposed project area,
2. Monitoring and maintaining water depth between 0.5 and 4.5 feet above recharge cells' finished grade,
3. Monitoring recharge rates, source water quality for turbidity, pH, temperature and electrical conductivity, and groundwater levels and quality, and
4. Implementing vector controls in cooperation with the San Joaquin County Mosquito and Vector Control District

Evaluation Criteria

This section describes in detail each of the following criteria and subcriteria required in the Funding Opportunity Announcement.

Evaluation Criterion A – Project Benefits (40 points)

Groundwater has long been a reliable water resource in California. According to the California Department of Water Resources (DWR), groundwater provides about 38% of the entire state water supply during average rainfall years and up to 46% or more during dry years. It serves as buffer against the impacts of drought and climate change. However, groundwater extraction in excess of natural recharge has caused historically low groundwater elevations in many regions of California, including San Joaquin County.

With the extreme weather patterns California experiences, floods or droughts, storage is the only solution to hold excess water for later use. However, surface storage can be costly for environmental or financial reasons. In contrast, suitable groundwater basins can provide ample storage space without the environmental or financial concerns. Conjunctive use of stored surface water and groundwater ensures a reliable availability and operational flexibility.

The 2014 National Climate Assessment stated that southwest US is already experiencing the impacts of climate change including “snowpack and streamflow amounts are projected to decline in parts of the southwest, decreasing surface water supply reliability for cities, agriculture, and ecosystems”. The SECURE Water Act Section 9503(c) – Reclamation Climate Change and Water 2011 report also stated:

“Temperature and precipitation changes are expected to affect hydrology in various ways including snowpack development. As noted previously, increased warming is expected to diminish the accumulation of snow during the cool season (i.e., late autumn through early spring) and the availability of snowmelt to sustain runoff during the warm season (i.e., late spring through early autumn)..... Changes in climate and snowpack within the Sacramento and San Joaquin River basins will change the availability of natural water supplies. These effects may be experienced in terms of changes to annual runoff and changes in runoff seasonality..... The effects of climate change on the recharge of Central Valley aquifers will be important in determining the potential to capture high fall–winter runoff and store it for later use during periods of surface water shortage.”

Increase Drought Resilience

As part of the North Site groundwater recharge project development, the District conducted two studies to evaluate the feasibility of the North Site. In 2013, the District initiated a study to characterize and assess the North Site. This study included lithologic data collection, field hydraulic conductivity measurement, soil grain-size distribution analysis, and geostatistical analysis. Based on the grain-size distribution and geostatistical analysis, the North Site showed better recharge through percolation with regard to connectivity to the aquifer than the existing 60-acre recharge facility.

The District also completed a feasibility study in 2014. The feasibility study included a Phase I Environmental Site Assessment (ESA), a pilot-scale field recharge test, completion of three monitoring wells, drill cuttings log and analysis, and groundwater quality sampling. The pilot scale field recharge test incorporated two 100-foot by 100-foot spreading basins with a 5-foot excavation depth and ponding depths between 1 and 3 feet. The test duration was 6 weeks and collected various data such as source water field parameters, spreading basin water depth,

groundwater depth data, groundwater quality data, evaporation and precipitation data, and site conditions for vector and attractive nuisances. The feasibility study concluded that percolation rates for the eastern portion of the North Site ranged between 0.32 and 0.59 ft/day, with an average of about 0.45 ft/day. The percolation rate confirms the earlier Farmington Study which estimated a long-term infiltration rate of 0.5 ft/day.

Based on the average recharge rate of 0.45 ft/day, the proposed 60-acre Southeast Recharge Basin would bank up to about 7,900 AF/Y of water. The average recharge is 4,400 AF/Y from the current 60-acre facility. Considering both annual recharge volumes, the recharge rate for the proposed 60-acre site is estimated to be between 5,500 to 6,500 AF/Y.

Since there are no sunset provisions associated with the Farmington Program or the proposed Southeast Recharge Basin, the benefit could be calculated as the cumulative amount of water available during droughts. The typical hydrological cycle for the San Joaquin Basin area is 5 years of average to wet precipitation and three years of average to dry precipitation. Conservatively, the proposed Southeast Recharge Basin would provide up to 32,500 AF of water in 5 years. During dry periods, the District's obligation for potable water supply is 20,000 AF/Y. For a three year drought, the banked groundwater of 32,500 AF (6,500 AF/Y for 5 years) is about 54% of the supply.

Due to funding restrictions, the District is developing the North Site Groundwater Recharge Basins in phases. The proposed 60-acre Southeast Recharge Basin, is the first phase. This phased approach would allow the District to observe and study any changes associated with a bigger recharge site such as recharge rates, groundwater mounding, and level of maintenance effort needed. The data and studies would be public records and would be available for future design and maintenance of the North Site as well as to other interested parties. Once fully developed and operational, the North Site Groundwater Recharge Basins could recharge up to about 26,500 AF/Y.

Increase Water Supply Reliability

The proposed Southeast Recharge Basins would increase the reliability of water supplies by storing excess water underground when it is plentiful to be used later when the pattern is dry. This type of project provides an additional water management "tool" so the District would not need to purchase water during droughts or dramatically reduce potable water supplies to the community. In fact, the District has already realized the benefits of the groundwater recharge/banking with the operations of the existing 60-acre recharge basin as part of the Farmington Recharge Program. Since 2003, SEWD has been banking about an average of 4,300 AF/Y of water for a total of about 57,000 ac-ft through 2014. In 2015, the fourth year drought California is experiencing, SEWD is installing one new well and starting up four existing wells

to extract the banked groundwater for municipal supply for the greater Stockton area. The District is and will continue to benefit from groundwater recharge and banking and, therefore, desires to expand the program by building additional recharge areas.

Deter Salt Water Intrusion and Land Subsidence

In addition, the District's groundwater recharge program adds to the natural recharge to guard against sea water intrusion from the west and subsidence associated with groundwater overdraft. The Farmington Study indicated that as early as the 1920s, the rate of groundwater withdrawal in San Joaquin County had exceeded the rate of replenishment, and the rate of extraction was continuing to increase. By the mid 1960's, a large pumping depression had formed below the City of Stockton with groundwater table below the sea level. This caused saline water intrusion from deposits under the Delta resulting in groundwater with high chloride levels unsuitable for continuous municipal supply purposes.

Provide Additional Seasonal Wetland Habitat

In addition to strengthening the groundwater system for a reliable water supply, the proposed project would also offer an ancillary environmental benefit by providing seasonal habitat. The development of urban and agricultural areas over the past century combined with the construction of flood control and water supply facilities has caused a loss of seasonal habitat areas in San Joaquin County. Seasonal wetland habitats are among the most biologically productive natural ecosystems in the world. Such seasonal habitats provide shelter and produce immense volumes of food for birds, insects, and plants. They are especially important to the survival of several threatened and endangered species. The Farmington Study reported that up to 43 percent of the threatened and endangered species rely directly or indirectly on seasonal wetland habitat for their survival. The proposed project would provide habitat for migrating birds as well insects and other wildlife. It is not uncommon to see birds in water detention basins. The Farmington Study concluded that the basin would provide season habitat opportunities and winter habitat for waterfowl.

Improve Flood Control Flexibility

The proposed project could also use diverted flood water as a recharge source. The diversion of flood waters would reduce in-stream flows and downstream flooding during flooding events. The greater benefit would be the ability to enhance the evacuation of water from flood control space in existing flood control facilities. The resulting increase in flexibility in the operation of flood control facilities could provide both economic and environmental benefits.

Evaluation Criterion B – Drought Planning and Preparedness (20 points)

In Governor Brown’s State of Emergency declaration for drought in 2014, he stated that California experienced the “driest year in recorded state history” and, unfortunately, dry conditions persisted into 2015. Now California is in a fourth year drought. As part of the state of emergency, an interagency Drought Task Force was convened to “provide a coordinated assessment of the State’s dry conditions and provide recommendations on current and future state actions”. The response to this statewide disaster required the combined efforts of all state agencies and the state’s model of mutual aid system. As part of the Drought Task Force, the California Water Action Plan was created. The California Water Action Plan is the State’s drought response plan as it developed a portfolio of actions to comprehensively address the drought challenges and climate change impacts. It is also a coordinated effort with all state agencies in supporting drought mitigation and relief efforts and providing emergency planning, response, and mitigation assistance.

Specifically, the California Water Action Plan called out “Support Distributed Groundwater Storage” and “Increase Statewide Groundwater Recharge” as actions to help the State meeting the “Reliability, Restoration, and Resilience” goals for future droughts. These goals are defined as: the reliability of water supplies, the restoration of important species and habitat, and a resilient sustainably managed water resource system. The distributed groundwater storage and increase groundwater recharge elements incorporate the needs to support distributed groundwater storage and increase statewide groundwater recharge. The proposed Southeast Groundwater Recharge Basin 1) is a local project not associated with any other existing or future federal and state storage facilities, 2) is not an in-stream storage project, and 3) is to increase additional groundwater recharge for reliable water supply for future drought conditions.

In addition to the California Water Action Plan, the Central Valley Project (which the District is a contractor of) and the State Water Project prepared “Drought Contingency Plan, January 5, 2015 – September 20, 2015” (DCP). The Drought Contingency Plan focused on the water needs for human health and safety and fish and wildlife habitat. Nevertheless, it indicated the need to use groundwater by many water contractors as an alternative source for drought water supply.

A copy of the California Water Action Plan and the Drought Contingency Plan, January 5 2015 – September 20, 2015 are attached as Appendix B.

Evaluation Criterion C – Severity of Actual or Potential Drought Impacts (20 points)

The proposed Southeast Groundwater Recharge Basin project is located in San Joaquin County, California, in the center of an exceptional drought as shown on the U.S. Drought Monitor, <http://droughtmonitor.unl.edu>, in Figure 4 below. California’s Central Valley region is in a fourth year drought with the past 2 years being severe with the driest conditions on record.

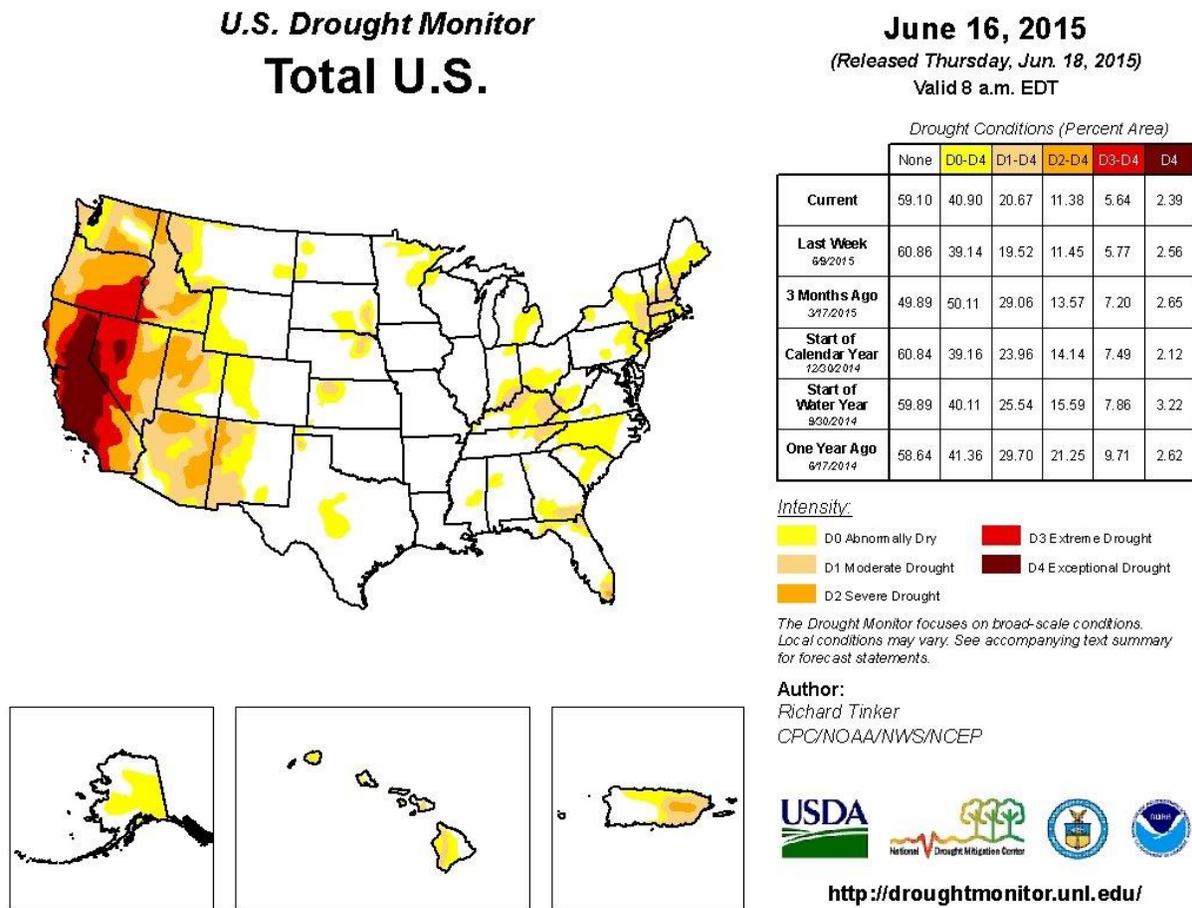


Figure 4 U.S. Drought Monitoring showing drought areas including California

The impacts of drought included curtailments of ALL water supplies by California’s State Water Resources Control Board (SWRCB). The Governor’s State of Emergency declaration, the State’s mandatory water conservations measures, in some areas up to 33% of the regular water use, the unprecedented settlement for 25% water cut between the SWRCB and Sacramento-San Joaquin Delta farmers, and the curtailment of pre-1914 water rights are just some of the examples of drought impacts. These severe measures are implemented because California is facing a real threat of “running out of water”.

Without the coordination of regulatory agencies and water users, there would be no water in streams or lakes for wildlife habitat or water related recreation. Some municipalities may run out of water, not even for hygiene/sanitary and fire protection uses. SEWD has implemented a cutback by providing agricultural water releases to senior water rights holders for only the first 10 days of the month of the summer growing season (May – August). Without this measure, the District would not be able to supply water to the 300,000 residents in the Greater Stockton area as water would be consumed by the senior agricultural water right holders. Many farmers, including have fallowed some of their prime farmland this year.

Even with these measures, California’s agriculture production is reduced as some farm lands are already being fallowed this year. A study entitled “Economic Analysis of the 2014 Drought for California” by the University of California, Davis is downloadable at: https://watershed.ucdavis.edu/files/biblio/DroughtReport_23July2014_0.pdf. The study concluded that the direct costs to agriculture totaled \$1.5 billion and the total statewide economic impact was \$2.2 billion, with a total loss of 17,100 seasonal and part-time jobs. In addition to agriculture, the drought also severely impact wildlife species. Increased water temperature causing “fish rescues” and lack of water triggering wildlife encounters are just some of the examples California Department of Fish and Wildlife is warning the public about.

In addition to the current drought, climate change is expected to have a significant affect in California. California Department of Water Resources released a “Climate Change in California” factsheet in June 2007, <http://www.water.ca.gov/climatechange/docs/062807factsheet.pdf>, which stated that “ a loss of at least 25 percent of Sierra snowpack” and “weather patterns are becoming more variable, causing more severe winter and spring flooding and longer, drier drought”. Furthermore, Governor’s Executive Order B-30-15 also stated:

“WHEREAS the Intergovernmental Panel on Climate Change concluded in its Fifth Assessment Report, issued in 2014, that "warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia" and that "continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts for people and ecosystems”

California has already seen the effects of climate change with the droughts. DWR is the state’s lead agency in climate change studies and planning and it has provided resources on its webpage, <http://www.water.ca.gov/climatechange>, for use by local and regional planning and management

agencies. Groundwater protection, conjunctive use, and groundwater recharge are a few approaches for a reliable and resilient water supply.

Evaluation Criterion E – Nexus to Reclamation (15 points)

The proposed project is one of SEWD’s approaches to drought planning and response. In addition to implement the groundwater recharge projects, the District also installed a new well and modified 2 agricultural wells to supplement the water for the WTP. Not only are the wells back-up/emergency supplies for use during drought conditions as a water supply reliability measure, they could also be modified in the future to include injection capabilities for further groundwater banking. The proposed Southeast Groundwater Recharge Basin would be the groundwater bank providing the source water for the wells. The proposed project is one of the key elements in furthering Reclamation’s water supplies by storing water underground, connecting local storage projects to Reclamation’s CVP systems, improving local water supply and management, and providing contingencies and safeguards against future droughts.

SEWD is one of USBR’s Eastside Water Service Contractors with supplies from CVP’s New Melones Reservoir. The proposed project would use the District’s CVP contract water or excess water from New Melones Reservoir when it is available. The recharged water would be extracted later during droughts for usage to the same customers New Melones Reservoir typically serves. The proposed project would not use other Reclamation’s facilities or impact Reclamation’s operations. The proposed project is also consistent with Reclamation’s mission as it manages, develops, and protect both groundwater and surface water supplies in an environmentally and economically sound manner for the citizens of San Joaquin County. The proposed project is not on tribal lands and the District does not supply water to any tribes.

Evaluation Criterion F – Project Implementation (5 points)

The District will be able to start the proposed project as soon as an award is made. The major tasks for the proposed project include; environmental analysis and compliance, project design, construction, and performance monitoring. A detailed project schedule with milestones and dates are shown in Table 1 below:

SOUTHEAST RECHARGE BASINS
STOCKTON EAST WATER DISTRICT

Table 1 Proposed Project Schedule

Tasks	2015							2016							2017												
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Grant Proposal Submittal	■																										
Grant Award		■																									
Financial Assistance Agreement			■	■	■																						
Environmental Compliance					◆																						
Project Design																											
Consultant selection			■	■																							
Environmental Analysis & Permitting				■	■	■																					
Field testing & pre-design activities					■	■	■			◆																	
50% Design							■																				
100% Design								■		◆																	
Construction																											
Bidding											■	■															
Contractor selection and award												■	■														
Mobilization												■	■														
Construction												■	■	■	■	■											
Demobilization and start up testing																■	◆										
Construction Management												■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Performance Monitoring																											
																											◆

◆ denotes milestones with deliverables

The first step of the project would be to start an environmental analysis with Reclamation staff for National Environmental Policy Act (NEPA) compliance and select a consultant to gather field information for design. Based on previous work performed by the District and the current agricultural operations at the entire North Site, it is expected that proposed project would only require an Environmental Assessment/Finding of No Significant Impact (EA/FONSI). This task could be completed by either District staff or the selected consultant with final approval from Reclamation. This portion of the work would take approximately 3 months to complete.

During the environmental evaluation phase, the selected consultant could conduct field investigation for the design of the project. The field investigation would include additional soil sampling and testing, surveying, additional monitoring wells installation, and other site related reconnaissance activities. It is the District’s desire to compile all new and past data into a detailed engineering report as it pertains to recharge basin operations. With the potential to expand the entire North Site into recharge basins, the District would need a detailed analysis on recharge water levels operations, percolation rates, basin cleaning and maintenance, and monitoring. The compiled data would become an engineering design report including basin design criteria, designed operational parameters, and future monitoring parameters and frequencies. This engineering report would be submitted to Reclamation.

After field investigations and documentation, the selected consultant would produce plans and specifications for the final design for bidding. The detailed design would entail water delivery pipe sizing, gates, valves, and weirs, slope and height of the recharge basin berms, recharge basin cells (if necessary), basin floor ridges or furrows, fill and cut volumes, compaction, and access

road design. The 100% designed documents would need to be routed to San Joaquin County Public Works department for review and concurrence for future construction permits. An electronic copy of the 100% design would also be submitted to Reclamation.

It is estimated that the construction period would last about 6 months or less after the issuance of a contract. Since the District is a public agency, construction of the proposed project would follow the California Public Contract Code for bidding and construction. The selected contractor would work with the District to obtain construction related permits such as Construction Stormwater General Permit from the SWRCB and a grading permit from San Joaquin County. The District would use a construction management consultant to oversee the construction to ensure construction proceeds as designed. The deliverables from this task would be the as-built drawings from the contractors and operations and maintenance manuals for mechanical appurtenances.

After construction, the current planned schedule would allow for a recharge monitoring period for about 8 months. If water is available for recharge, the District would monitor and document the amount of recharged water for the duration and provide a performance monitoring report as part of the project closeout Final Report to Reclamation.

The proposed project would not require any policy or administrative actions or changes as the District is currently operating groundwater recharge facilities. There would be additional operational resources needed for on-going recharge related activities and maintenance, as expected.

Performance Measures

The performance of the proposed project would be measured based on the amount of water recharged. Groundwater recharge is a long-term project and the improvement is realized during droughts when the incremental yield becomes a cumulative benefit. As discussed earlier, the benefit of the proposed project is to store about 5,500 AF/Y to 6,500 AF/Y of water per year.

SECTION III ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

As part of the feasibility study performed in 2014, the District conducted an environmental analysis as part of the California Environmental Quality Act (CEQA) compliance, similar to NEPA. A draft Initial Study (IS) and Negative Declaration (ND) was prepared by the District. The purpose of the IS/ND was to disclose the environmental effects of groundwater recharge testing at the North Site. The IS/ND focused on environmental effects caused by the demonstration-level or full-scale recharge test and identified best management practices that would reduce environmental effects to a less-than-significant level. The final ND and Notice of Determination were certified in March 2013. Information from the IS/ND will be used to respond to questions in this section of the grant proposal. In general, the proposed activities would have short-term but less than significant construction related impacts on air quality, traffic, biological resources, noise, and cultural resources.

Environment Impact (soil, air, water, animal habitat)

Every reasonable precaution will be exercised to protect surface waters from pollution related to construction activities. Construction operations will be scheduled and conducted so as to avoid or minimize muddying and silting of surface waters. Specific procedures to be followed and protective measures to be installed to ensure that water pollution to streams, waterways, and other bodies of water do not become polluted by sediment or other substances during construction. Construction of the project would be covered under California's Construction Stormwater General permit which requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP).

To prevent the generation of dust, unpaved areas where vehicles are operated will be periodically wetted down or given an equivalent form of treatment. To control air pollution other than dust, the following procedures will be followed:

- All volatile liquids, including fuels and solvents, will be stored in closed containers.
- Open burning of debris, lumber, or other scrap will not occur.
- Equipment will be properly maintained to reduce gaseous pollutant emissions.

There are no wetlands or other surface water inside the proposed project area that fall under Clean Water Act jurisdiction as "Waters of the United States". The area is actively farmed with irrigation supply from the District's raw water pipes.

Water Delivery System

The proposed project would receive water from both New Hogan and New Melones reservoirs via the WTP's raw water intake lines. Raw water intake from the New Hogan reservoir was originally constructed in 1977 when the WTP first came online. The New Melones reservoir system was operational in 1997. The proposed project would tap in these existing systems and pipelines and would not result in any modification or effects of any extensive modification of any irrigation systems.

Biological – Federal threatened or endangered species, or designated critical habitat

Currently, no environmentally sensitive habitats or threatened or endangered species are known to be associated with the site. SEWD would comply with the San Joaquin Multi-Species Habitat Conservation and Open Spaces Plan (SJMSCP). The Project site is located within the area covered by the SJMSCP. The SJMSCP is a comprehensive program for assessing and mitigating the biological effects of land development. Compliance with the SJMSCP would provide for impact avoidance measures and mitigation for loss of habitat for all species that may be affected by this impact. Participation is generally optional; that is, projects may use the SJMSCP to reach compliance with the various statutes and regulations that apply to biological resource protection or it may comply with those requirements independently.

The SJMSCP is to be locally implemented by the San Joaquin County Council of Governments. The Compliance process outlined in the SJMSCP has been adopted by Federal and state agencies with jurisdiction of trusteeship over biological resources. In addition, the SJMSCP has been adopted locally by San Joaquin County, the Council of Governments, the City of Stockton, and incorporated cities and entities in San Joaquin County.

Grading would remove weedy vegetation and small rodent dwellings such as ground squirrel burrows. Maintenance of the proposed project site would prevent ground squirrels from becoming established and would discourage burrowing owls or giant garter snake from occupying the area.

Burrowing owl – Burrowing owls have been observed at the existing SEWD property in the past. If pre-construction surveys determine that burrowing owls are present, they would not be disturbed from February 1 through August 31 during their breeding season. A buffer zone of 250 feet would be maintained to avoid disturbances of the occupied nesting area. In addition, there may be temporary impacts to the burrowing owl due to the loss of foraging habitat resulting from grading. The adjacent and surrounding area provides adequate nesting and foraging habitat. BMPs that require avoidance buffer zones are preferred to passive relocation.

Maintenance of the proposed project site would prevent burrowing animals from creating potential habitat for special-status species.

Swainson's hawks – No Swainson's hawks have been observed at the proposed project site and no nests or potential nesting sites have been identified.

Giant garter snake – Giant garter snakes have not been observed at the North Site visits; however, the surrounding areas may provide suitable habitat. Maintenance of the proposed project site will be necessary to prevent burrowing animals from creating potential habitat for special-status species.

Migratory Birds – It is anticipated that migratory birds may nest and forage near the proposed project site, as previously stated environmental benefit.

Special-status plants – No special-status plants have been observed at the North Site site-visits or recorded in the proposed project area. If special-status plants are present, direct effects may occur from grading, and site maintenance. If pre-construction surveys determine that special-status plants are present the appropriate agency would be consulted to avoid impacts to special-status plants.

Fish – No in-stream work is required for the proposed project; therefore no impact to fisheries is expected.

Implementing BMPs during construction would result in less-than-significant effects to the burrowing owl, Swainson's hawk, giant garter snake, and other special-status species. All impacts, therefore, would be less than significant.

Historical and Cultural Resources

There are no known archaeological or culturally sensitive sites within the project limits. If unrecorded archaeological or culturally sensitive sites are discovered during construction, the discovered item will be protected from damage or destruction, work in the immediate vicinity of the site will be stopped, the perimeter of the site will be clearly marked, and the District will be promptly notified so that the find can be evaluated and appropriate mitigation actions can be performed.

There are no known prehistoric or historic subsurface cultural resources at the North Site location. This is agricultural land and has on-going farming associated with the site. In the event that any prehistoric or historic subsurface cultural resources are discovered during construction-related earth-moving activities, all work shall be halted and a qualified archeologist

(or paleontologist) will be consulted to assess the significance of the find. If any find is determined to be significant by the archeologist, SEWD and the archeologist shall determine the appropriate course of action. If the discovery includes human remains of Native American origin, SEWD would coordinate activities with the Native American Heritage Commission. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curator, and a report prepared by the archeologist, according to current professional standards. With these actions, there will be a less than significant impact.

Low Income or Minority Population Impacts

The proposed project would not have any effect on low income or minority populations as the District currently owns the proposed project site currently used for agricultural operations.

SECTION IV REQUIRED PERMITS AND APPROVALS

The required permits would be construction related permits. Two permits are required: Construction Storm Water General Permit from the SWRCB and grading permit from San Joaquin County.

Construction General Permit

The District would need to apply for coverage under the Construction General Permit from the SWRCB which would require a Storm Water Pollution and Prevention Plan (SWPPP) prepared by qualified persons only. This plan would be the responsibility of the contractor who will implement the details of the plan. The District would review the plan prior to submittal.

Grading Permit

The Contractor would apply for a grading permit from San Joaquin County prior to any earth moving activities. The District would submit the 100% designed plans and specifications to San Joaquin County for review and concurrence to ensure a smooth permitting process later on.

SECTION V LETTERS OF SUPPORT

The District received a letter of support from the California DWR. DWR is the main state agency overseeing the development of water resources and water management activities in California.

SOUTHEAST RECHARGE BASINS
STOCKTON EAST WATER DISTRICT

DEPARTMENT OF WATER RESOURCES

NORTH CENTRAL REGION OFFICE
3500 INDUSTRIAL BOULEVARD
WEST SACRAMENTO, CA 95691



JUN 18 2015

Ms. Cathy Lee, P.E.
District Engineer
Stockton East Water District
Post Office Box 5157
Stockton, California 95205

Dear Ms. Lee,

The Department of Water Resources (DWR) understands that the Stockton East Water District (District) is applying for a U.S. Bureau of Reclamation WaterSMART Drought Resiliency Project Grant for Fiscal Year 2015. The application requests funding for the District's proposal to complete the final design and construct additional ponds to expand existing groundwater recharge/storage activities in an area north of the District's urban water treatment plant. The District's proposal is also a part of the Eastern San Joaquin Integrated Regional Water Management Plan.

Groundwater recharge/storage is included in the Resource Management Strategies identified in the California Water Plan Update 2013 to achieve multiple water management objectives, including prevention of salt water intrusion, availability of groundwater supplies at times of drought, and healthy groundwater levels to reduce pumping energy demands and costs.

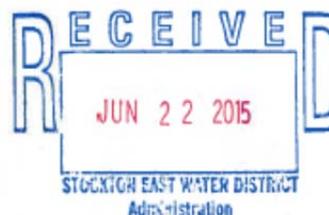
As such, DWR is supportive of groundwater recharge/storage projects as part of an integrated strategy to address regional water resources needs.

DWR wishes you success in obtaining grant funding to complete this project. If you have any questions, please contact Mr. Jason Preece at Jason.preece@water.ca.gov or (916) 651-9636.

Sincerely,

A handwritten signature in blue ink, appearing to read "Eric Hong".

Eric Hong, Chief
North Central Region Office
Division of Integrated Regional Water Management



SECTION VI OFFICIAL RESOLUTION

The District's Board of Directors adopted a resolution for the Drought Resiliency Project Grant financial assistance at its June 23, 2015 meeting.

Resolution No. 15-16-04

A RESOLUTION OF THE BOARD OF DIRECTORS OF
STOCKTON EAST WATER DISTRICT

AUTHORIZATION TO FILE A GRANT APPLICATION WITH THE
DEPARTMENT OF INTERIOR UNITED STATES BUREAU OF RECLAMATION
FOR THE WATERSMART: DROUGHT RESILIENCY PROJECT GRANTS PROGRAM
(FUNDING NO. R15AS00046) FOR FISCAL YEAR 2015, EXECUTE ANY REQUIRED
DOCUMENTS AND PROVIDE DELEGATION OF AUTHORITY

WHEREAS, the Board of Directors of the Stockton East Water District desires to file a grant application with the Department of the Interior United States Bureau of Reclamation for the WaterSMART: Drought Resiliency Project Grants Program (Funding No. R15AS00046) for the North Site Groundwater Banking Project; and

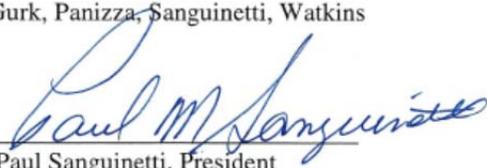
WHEREAS, the General Manager, Scot A. Moody of the Stockton East Water District is hereby authorized and directed to prepare the necessary data, conduct investigations, file such application, and execute a grant agreement with Department of the Interior United States Bureau of Reclamation; and

WHEREAS, the General Manager, Scot A. Moody of the Stockton East Water District and his designee of the Stockton East Water District are hereby authorized and delegated to submit reports, request for cost reimbursement, and conduct day-to-day business with Department of the Interior United States Bureau of Reclamation;

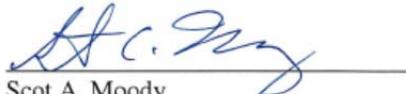
NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Stockton East Water District that the grant application be made to the Department of the Interior United States Bureau of Reclamation to obtain a WaterSMART: Drought Resiliency Project Grant (Funding No. R15AS00046), and to enter into an agreement to receive the grant.

PASSED AND ADOPTED at a regular meeting by the Board of Directors of the Stockton East Water District on the 23rd day of June 2015 by the following vote of the members thereof:

AYES:	Atkins, Cortopassi, McGaughey, McGurk, Panizza, Sanguinetti, Watkins
NAYES:	None
ABSENT:	None
ABSTAIN:	None


Paul Sanguinetti, President

ATTEST:


Scot A. Moody
Secretary of the Board



Appendix A

Required Forms

- SF 424 Application for Federal Assistance
- SF 424 C Budget Information – Construction Programs
- SF 424 D Assurances Construction Program



Grant Application Package

Opportunity Title:	WaterSMART: Drought Resiliency Project Grants for Fisca
Offering Agency:	Bureau of Reclamation
CFDA Number:	15.514
CFDA Description:	Reclamation States Emergency Drought Relief
Opportunity Number:	R15AS00046
Competition ID:	
Opportunity Open Date:	05/11/2015
Opportunity Close Date:	06/25/2015
Agency Contact:	Irene Hoiby Grants Officer E-mail: ihoiby@usbr.gov Phone: 303-445-2025

This opportunity is only open to organizations, applicants who are submitting grant applications on behalf of a company, state, local or tribal government, academia, or other type of organization.

Application Filing Name:

Select Forms to Complete

Mandatory

[Application for Federal Assistance \(SF-424\)](#) Complete

Optional

- [Budget Information for Construction Programs \(SF-424C\)](#) Complete
- [Attachments](#) Complete
- [Assurances for Construction Programs \(SF-424D\)](#) Complete
- [Disclosure of Lobbying Activities \(SF-LLL\)](#)
- [Budget Information for Non-Construction Programs \(SF-424A\)](#)
- [Assurances for Non-Construction Programs \(SF-424B\)](#)

Instructions

[Show Instructions >>](#)

This electronic grants application is intended to be used to apply for the specific Federal funding opportunity referenced here. If the Federal funding opportunity listed is not the opportunity for which you want to apply, close this application package by clicking on the "Cancel" button at the top of this screen. You will then need to locate the correct Federal funding opportunity, download its application and then apply.

Application for Federal Assistance SF-424	
* 1. Type of Submission: <input type="checkbox"/> Preapplication <input checked="" type="checkbox"/> Application <input type="checkbox"/> Changed/Corrected Application	
* 2. Type of Application: <input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision	
* If Revision, select appropriate letter(s): _____ * Other (Specify): _____	
* 3. Date Received: Completed by Grants.gov upon submission.	4. Applicant Identifier: _____
5a. Federal Entity Identifier: _____	5b. Federal Award Identifier: _____
State Use Only:	
6. Date Received by State: _____	7. State Application Identifier: _____
8. APPLICANT INFORMATION:	
* a. Legal Name: Stockton East Water District	
* b. Employer/Taxpayer Identification Number (EIN/TIN): 90-0036995	* c. Organizational DUNS: 0661228540000
d. Address:	
* Street1: 6767 E. Main Street	_____
Street2:	_____
* City: Stockton	_____
County/Parish: San Joaquin	_____
* State: CA: California	_____
Province:	_____
* Country: USA: UNITED STATES	_____
* Zip / Postal Code: 95215-1527	_____
e. Organizational Unit:	
Department Name: _____	Division Name: _____
f. Name and contact information of person to be contacted on matters involving this application:	
Prefix: _____	* First Name: Cathy
Middle Name: _____	
* Last Name: Lee	_____
Suffix: _____	
Title: _____	
Organizational Affiliation: _____	
* Telephone Number: 2094443119	Fax Number: 2099484219
* Email: clee@sewd.net	

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

D: Special District Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Bureau of Reclamation

11. Catalog of Federal Domestic Assistance Number:

15.514

CFDA Title:

Reclamation States Emergency Drought Relief

*** 12. Funding Opportunity Number:**

R15AS00046

* Title:

WaterSMART: Drought Resiliency Project Grants for Fiscal Year 2015

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment

Delete Attachment

View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Southeast Groundwater Recharge Basin
North Site Groundwater Recharge Basin Project

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant

* b. Program/Project

Attach an additional list of Program/Project Congressional Districts if needed.

17. Proposed Project:

* a. Start Date:

* b. End Date:

18. Estimated Funding (\$):

* a. Federal	<input type="text" value="300,000.00"/>
* b. Applicant	<input type="text" value="546,453.10"/>
* c. State	<input type="text" value="0.00"/>
* d. Local	<input type="text" value="0.00"/>
* e. Other	<input type="text" value="0.00"/>
* f. Program Income	<input type="text" value="0.00"/>
* g. TOTAL	<input type="text" value="846,453.10"/>

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

- a. This application was made available to the State under the Executive Order 12372 Process for review on
- b. Program is subject to E.O. 12372 but has not been selected by the State for review.
- c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

- Yes
- No

If "Yes", provide explanation and attach

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: * First Name:
Middle Name:
* Last Name:
Suffix:

* Title:

* Telephone Number: Fax Number:

* Email:

* Signature of Authorized Representative: * Date Signed:

ATTACHMENTS FORM

Instructions: On this form, you will attach the various files that make up your grant application. Please consult with the appropriate Agency Guidelines for more information about each needed file. Please remember that any files you attach must be in the document format and named as specified in the Guidelines.

Important: Please attach your files in the proper sequence. See the appropriate Agency Guidelines for details.

1) Please attach Attachment 1	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
2) Please attach Attachment 2	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
3) Please attach Attachment 3	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
4) Please attach Attachment 4	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
5) Please attach Attachment 5	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
6) Please attach Attachment 6	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
7) Please attach Attachment 7	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
8) Please attach Attachment 8	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
9) Please attach Attachment 9	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
10) Please attach Attachment 10	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
11) Please attach Attachment 11	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
12) Please attach Attachment 12	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
13) Please attach Attachment 13	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
14) Please attach Attachment 14	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
15) Please attach Attachment 15	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>

BUDGET INFORMATION - Construction Programs

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	\$	\$	\$
2. Land, structures, rights-of-way, appraisals, etc.	\$	\$	\$
3. Relocation expenses and payments	\$	\$	\$
4. Architectural and engineering fees	\$ 166,000.00	\$ 0.00	\$ 166,000.00
5. Other architectural and engineering fees	\$ 8,143.10	\$ 0.00	\$ 8,143.10
6. Project inspection fees	\$ 24,000.00	\$ 0.00	\$ 24,000.00
7. Site work	\$	\$	\$
8. Demolition and removal	\$	\$	\$
9. Construction	\$ 648,310.00	\$	\$ 648,310.00
10. Equipment	\$	\$	\$
11. Miscellaneous	\$	\$	\$
12. SUBTOTAL (sum of lines 1-11)	\$ 846,453.10	\$ 0.00	\$ 846,453.10
13. Contingencies	\$	\$	\$
14. SUBTOTAL	\$ 846,453.10	\$ 0.00	\$ 846,453.10
15. Project (program) income	\$	\$	\$
16. TOTAL PROJECT COSTS (subtract #15 from #14)	\$ 846,453.10	\$ 0.00	\$ 846,453.10
FEDERAL FUNDING			

17. Federal assistance requested, calculate as follows:
 (Consult Federal agency for Federal percentage share.) Enter eligible costs from line 16c Multiply X %
 Enter the resulting Federal share. \$

ASSURANCES - CONSTRUCTION PROGRAMS

OMB Number: 4040-0009
Expiration Date: 06/30/2014

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0042), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant:, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure non-discrimination during the useful life of the project.
4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progressive reports and such other information as may be required by the assistance awarding agency or State.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards of merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
10. Will comply with all Federal statutes relating to non-discrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681 1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333) regarding labor standards for federally-assisted construction subagreements.
14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq).
18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.
20. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE General Manager
APPLICANT ORGANIZATION Stockton East Water District	DATE SUBMITTED Completed on submission to Grants.gov

Appendix B

Drought Preparation and Planning Documents

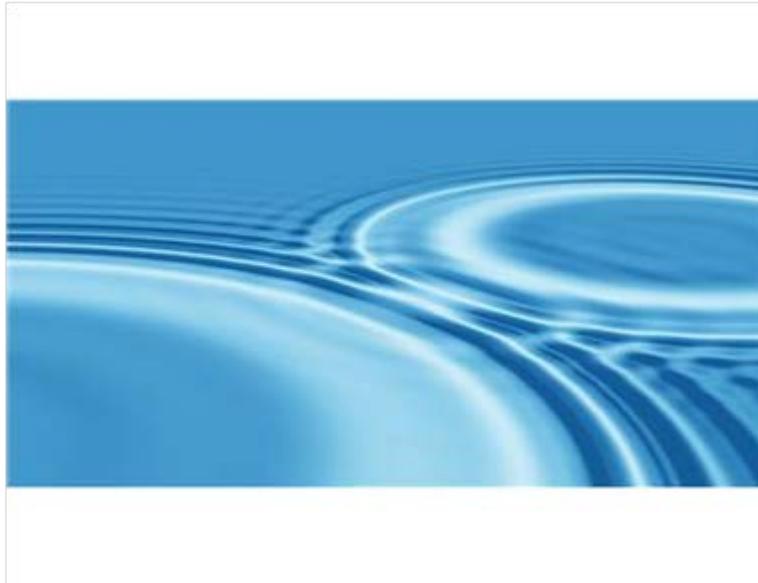
- California Water Action Plan, and
- Drought Contingency Plan, January 5, 2015 – September 20, 2015, Central Valley Project and State Water Project.

Appendix B

Drought Preparation and Planning Documents

- California Water Action Plan, and
- Drought Contingency Plan, January 5, 2015 – September 20, 2015, Central Valley Project and State Water Project.

California Water Action Plan





Among all our uncertainties, weather is one of the most basic. We can't control it. We can only live with it, and now we have to live with a very serious drought of uncertain duration.

Right now, it is imperative that we do everything possible to mitigate the effects of the drought. I have convened an Interagency Drought Task Force and declared a State of Emergency. We need everyone in every part of the state to conserve water. We need regulators to rebalance water rules and enable voluntary transfers of water and we must prepare for forest fires. As the State Water Action Plan lays out, water recycling, expanded storage and serious groundwater management must all be part of the mix. So too must be investments in safe drinking water, particularly in disadvantaged communities. We also need wetlands and watershed restoration and further progress on the Bay Delta Conservation Plan.

It is a tall order.

But it is what we must do to get through this drought and prepare for the next.

Edmund G. Brown Jr.

State of the State Speech, January 22, 2014

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Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government	6
Achieve the Co-Equal Goals for the Delta	7
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Manage and Prepare for Dry Periods	12
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California Water Action Plan: Actions for Reliability, Restoration and Resilience

Introduction

California has seen many flood events, including the most recent flood of 1995 when 48 of 58 counties declared a state of emergency. After two years of dry weather and shrinking reservoir supplies, we are reminded once again that nothing focuses Californians' attention on our limited water resources like drought.

There is broad agreement that the state's water management system is currently unable to satisfactorily meet both ecological and human needs, too exposed to wet and dry climate cycles and natural disasters, and inadequate to handle the additional pressures of future population growth and climate change. Solutions are complex and expensive, and they require the cooperation and sustained commitment of all Californians working together. To be sustainable, solutions must strike a balance between the need to provide for public health and safety (*e.g.*, safe drinking water, clean rivers and beaches, flood protection), protect the environment, and support a stable California economy. This action plan lays out our challenges, our goals and decisive actions needed now to put California's water resources on a safer, more sustainable path. While this plan commits the state to moving forward, it also serves to recognize that state government cannot do this alone. Collaboration between federal, state, local and tribal governments, in coordination with our partners in a wide range of industry, government and nongovernmental organizations is not only important—it is essential. The input and contributions received from all of these partners throughout the drafting of this action plan have resulted in a comprehensive and inclusive plan.

Challenges for Managing California's Water Resources

Water has always been a scarce resource in California. Most of the precipitation falls on the west-facing slopes of Northern California mountain ranges, yet most of the population and irrigated farmland is located in the drier southern half of the state. Precipitation is highly variable year-to-year, but the long warm summers are always dry. In the mid-20th century, state, federal and local agencies vastly expanded the state's system of reservoirs, canals, pumps and pipelines to store water and deliver it to agricultural and urban users in dry areas. Also, in the late 20th century, significant investments were made in the state's flood protection system, including levees and bypasses. These changes to the physical infrastructure have resulted in unintended consequences to the natural world. In general, there is broad consensus about our challenges.

Uncertain water supplies – Reductions in water from major watersheds like the Colorado River watershed and the Sacramento-San Joaquin Delta (Delta) watershed—due to hydrologic and declining environmental conditions—have made these water supplies less reliable. Moreover, climate change impacts to these sources and the Cascade and Sierra headwaters will further strain supply reliability throughout the state. These sources are foundational supplies around which communities develop and manage local resources through strategies such as water use efficiency, recycled water, and groundwater recharge. The unreliable nature of these supplies threatens local, regional and statewide economies. **Collectively, the actions in this plan will contribute to more reliable water supplies.**

Water scarcity/drought – California’s hydrology has always included extended dry periods. Much of California’s water system was originally designed to withstand a seven-year dry period without severe damage to the economy and environment. Today some regions and many communities struggle to maintain adequate water supplies after only a year or two of dry conditions. Climate change makes this situation even more challenging. Less outflow of water coming from the Cascades and Sierras during periods of drought increases seawater intrusion into the Delta. Improving our ability to manage scarce water supplies and over-stressed groundwater basins and better coordination of major reservoir operations is essential to economic and environmental sustainability. Taking action to address drought is especially urgent for agriculture where crops wither without water, and the world’s growing population and food demand create food security concerns. **This action plan includes both immediate steps for 2014 as well as actions that will better prepare California for future droughts.**

Declining groundwater supplies – Groundwater accounts for more than one-third of the water used by cities and farms – much more in dry years, when other sources are cut back. Some of California’s groundwater basins are sustainably managed, but unfortunately, many are not. Inconsistent and inadequate tools, resources and authorities make managing groundwater difficult in California and impede our ability to address problems such as overdraft, seawater intrusion, land subsidence, and water quality degradation. Pumping more than is recharged lowers groundwater levels – which makes extracting water more expensive and energy intensive. Under certain conditions, excessive groundwater pumping could mobilize toxins that impair water quality and cause irreversible land subsidence which damages infrastructure and diminishes the capacity of aquifers to store water for the future. When properly managed, groundwater resources will help protect communities, farms and the environment against the impacts of prolonged dry periods and climate change. **The strategies identified in this action plan will move California toward more sustainable management of our groundwater resources.**

Poor water quality – It is a fact that millions of Californians rely, at least in part, on contaminated groundwater for their drinking water. While most water purveyors blend or treat water to meet public health standards, many disadvantaged communities cannot afford to do so. In addition, domestic wells are drying up in many areas. All Californians have a right to safe, clean, affordable and accessible water adequate for human consumption, cooking and sanitary purposes. Safe water is necessary for public health and community prosperity. **The methods set forth in this action plan will improve the organization of our water quality programs and create new tools to help ensure that every Californian has access to safe water.**

Declining native fish species and loss of wildlife habitat – California’s once robust native fish populations are at or near historic lows. Federal and state fish agencies now list many species of salmon and other fish as endangered and threatened. Wildlife habitat is also being lost at a rapid pace. Climate change further threatens the state’s natural biodiversity. Many do not understand that our fish and wildlife are part of the complex system that provides and protects California’s water resources. Tourism and fishing which provide economic benefits to local communities and to the state are also reliant on healthy ecosystems. Declining species and lost habitat disrupt the cultural, spiritual and ecological practices of California’s Native American tribes. Simply put, California’s diverse and unique ecosystems are irreplaceable and their loss threatens the sustainability of all of California’s communities. **The objectives in this action plan include aggressive ecosystem restoration and other steps that will restore fish populations and benefit wildlife.**

Floods – Over 7 million Californians live in a floodplain. Historically, flooding has occurred in all regions of the state. Our state’s capital, Sacramento, has one of the lowest levels of flood protection of any major city in the nation. Climate change will only exacerbate this problem. More precipitation will fall as rain rather than snow, snowmelt will occur earlier, and there will be more extreme weather events. **This action plan will serve to coordinate and streamline flood control efforts and result in multi-benefit flood projects, helping to mitigate the significant investments needed to improve flood protection for existing communities and infrastructure.**

Supply disruptions – Many parts of California’s water system are vulnerable to earthquakes and flooding, particularly the Delta, which serves as the conveyance hub for a substantial percentage of all water supplies in the Bay Area, the San Joaquin Valley, and Southern California. A large earthquake along any of five major faults or a major storm-induced levee failure could render this water supply unreachable or unusable for urban and agricultural needs for months. **The combined benefits of many of the actions in this plan will better prepare us to manage through potential disruptions in the system.**

Population growth and climate change further increase the severity of these risks – The state’s population is projected to grow from 38 million to 50 million by 2049.¹ The effects of climate change are already being felt and will worsen. The Sierra snowpack is decreasing, reducing natural water storage and altering winter and spring runoff patterns. This is most likely the result of higher temperatures and may also be related to air pollution that deposits fine particulate on the surface of snow, changing its reflectivity and causing it to absorb more heat and melt faster. Higher river and ocean water temperatures will make it harder to maintain adequate habitat for native fish species. Higher ocean temperatures will alter the already changing weather patterns. Sea level rise threatens coastal communities and islands in the Delta. Sea level rise also amplifies the risk that the pumps that supply cities and farms with Delta water will be inundated with seawater in a large earthquake or storms that breach levees. **The strategies identified in this action plan will help protect our resources from more frequent and more severe dry periods which threaten the health of our natural systems and our ability to meet our diverse water supply and water quality needs.**

Goals: Reliability, Restoration and Resilience

The California Water Action Plan has been developed to meet three broad objectives: more reliable water supplies, the restoration of important species and habitat, and a more resilient, sustainably managed water resources system (water supply, water quality, flood protection, and environment) that can better withstand inevitable and unforeseen pressures in the coming decades. Over the next five years, the actions discussed below will move California toward more sustainable water management by providing a more reliable water supply for our farms and communities, restoring important wildlife habitat and species, and helping the state’s water systems and environment become more resilient.

¹ <http://www.dof.ca.gov/research/demographic/reports/projections/view.php> California’s population will cross the 50 million mark in 2049 and grow to nearly 52.7 million by 2060.

Working Together and Continued Collaboration is Essential

Despite the many challenges for water management in California, there is good progress to report. There are thousands of important projects that are being planned or implemented by all levels of government as well as by conservationists, tribes, farmers, water agencies and others. State, regional and local agencies have increasingly been pursuing a strategy of making regions more self-reliant by reducing water demand and by developing new or underused water resources locally. In the future, most new water will come from a combination of improved conservation and water use efficiency, conjunctive water management (i.e., coordinated management of surface and groundwater), recycled water, drinking water treatment, groundwater remediation, and brackish and seawater desalination. There is increased focus on projects with multiple benefits, such as stormwater capture and floodplain reconnection, that can help simultaneously improve the environment, flood management and water supplies. These diversified regional water portfolios will relieve pressure on foundational supplies and make communities more resilient against drought, flood, population growth and climate change.

This Water Action Plan does not replace these local efforts. It complements and leverages them. Collaboration is essential. Successful implementation of this plan will require increased collaboration between state, federal and local governments, regional agencies, tribal governments, and the public and the private sectors. The Legislature is also a key partner.

Water has shaped California's past, its present, and will help define its future. Water has always been among the state's most contentious issues. California is at its best when people come together in the face of adversity to solve difficult problems. Only by working together can we improve and sustain the state's water future for generations to come.

Actions

1. Make conservation a California way of life;
2. Increase regional self-reliance and integrated water management across all levels of government;
3. Achieve the co-equal goals for the Delta;
4. Protect and restore important ecosystems;
5. Manage and prepare for dry periods;
6. Expand water storage capacity and improve groundwater management;
7. Provide safe water for all communities;
8. Increase flood protection;
9. Increase operational and regulatory efficiency;
10. Identify sustainable and integrated financing opportunities.

Together, these actions address the most pressing water issues that California faces while laying the groundwork for a sustainable and resilient future and are critical to moving the state forward now. They reflect an integration of new ideas with the ongoing important work that the state and federal government, local agencies, and others are already engaged in and require coordination and collaboration across levels of government. They will not address all of our challenges. Some of these actions are new proposals. Some are currently being planned and should be completed more rapidly, implemented in a better way, or on a larger scale. Success will require the cooperation of many partners; the state's role is to lead, help others, and remove barriers to action.

1. MAKE CONSERVATION A CALIFORNIA WAY OF LIFE

Conservation must become a way of life for everyone in California. Much has changed in the past half century, and our technology, values and awareness of how we use water have helped to integrate conservation into our daily lives. There is more that can be done and all Californians must embrace this effort. In 2009, the state adopted the Water Conservation Act through the passage of Senate Bill X7 7 requiring that we achieve a 20 percent reduction in urban per capita water use by December 31, 2020, promoting expanded development of sustainable water supplies at the regional level, and requiring agricultural water management plans and efficient water management practices for agricultural water suppliers. Conservation and efficiency are also keys to reducing the energy needed to pump, transport, treat and deliver water – an important action included in the state’s Climate Change Scoping Plan for reducing greenhouse gas emissions. We must continue to build on our existing efforts to conserve water and promote the innovation of new systems for increased water conservation.

- **Expand Agricultural and Urban Water Conservation and Efficiency to Exceed SBX7 7 Targets**
The administration will expand existing programs to provide technical assistance, shared data and information, and incentives to urban and agricultural local and regional water agencies, as well as local governmental agencies, to promote agricultural and urban water conservation in excess of the amounts envisioned by SBX7 7. We will work collaboratively with stakeholders to identify and remove impediments to achieving statewide conservation targets, recycling and stormwater goals; to evaluate and update targets for additional water use efficiency, including consideration of expanding the 20 percent by 2020 targets by holding total urban water consumption at 2000 levels until 2030, achieving even greater per capita reductions in water use. The administration will also work with local and regional entities to develop performance measures to evaluate agricultural water management.
- **Provide Funding for Conservation and Efficiency**
The administration will work with the Legislature to expand funding for urban and agricultural water use efficiency research, and the development and implementation of efficiency standards through existing and new programs that save water and the energy associated with water use. Conservation programs must include numeric targets and be designed to achieve the state-developed targets and performance measures.
- **Increase Water Sector Energy Efficiency and Greenhouse Gas Reduction Capacity**
The administration will continue supporting the collection of regional data and development of efficiency standards that save water and energy associated with water use and will provide guidance on conservation rates and sustainable financing that achieve water and energy savings. The administration will also continue to collaborate with water and wastewater agencies and energy utilities to educate consumers on the water-energy nexus. The administration will work with the Legislature to eliminate barriers to co-funding projects with water and energy benefits and expand and prioritize funding and technical support for water and wastewater agencies that achieve energy efficiency co-benefits and greenhouse gas reductions.
- **Promote Local Urban Conservation Ordinances and Programs**
Local agencies are increasingly conserving water by prohibiting certain types of wasteful water use. Examples include: prohibiting watering hard surfaces such as sidewalks, walkways, driveways or parking areas; prohibiting outdoor watering during periods of rain; and not serving water to customers in restaurants unless specifically requested. Local agencies are also pioneering incentive programs, for example, converting lawns to drought tolerant landscapes—and programs to capture rainwater.

2. INCREASE REGIONAL SELF-RELIANCE AND INTEGRATED WATER MANAGEMENT ACROSS ALL LEVELS OF GOVERNMENT

While California has vast infrastructure to store and deliver water miles from its origin, the majority of infrastructure management and investment resides at the local and regional levels. Sometimes that management is done by agencies responsible for multiple functions such as flood management, water supply and water quality. Other times, individual agencies handle those functions separately. Over the past decade, the state has provided technical and financial assistance to regions to incentivize inter-agency/stakeholder cooperation in planning and implementing multi-objective actions that provide both regional and statewide benefits to water resources management and protection. Called "integrated water management," this approach balances the objectives of improving public safety, fostering environmental stewardship, and supporting economic stability. Developing local supplies can also save energy by reducing the distance that water must be transported. State grants are provided to both incentivize regional integration and leverage local financial investment.

Ensuring water security at the local level includes efforts to conserve and use water more efficiently, to protect or create habitat for local species, to recycle water for reuse, to capture and treat stormwater for reuse, and to remove salts and contaminants from brackish or contaminated water or from seawater. But, mostly it requires integrating disparate or individual government efforts into one combined regional commitment where the sum becomes greater than any single piece.

- **Support and Expand Funding for Integrated Water Management Planning and Projects**
The administration will work with the Legislature to enhance the Integrated Water Management Planning program. Providing funding for regionally-driven, multi-benefit projects that prioritize protection of public health is critical. The administration will target funding to local regional projects that increase regional self-reliance and result in integrated, multi-benefit solutions for ensuring sustainable water resources.
- **Update Land Use Planning Guidelines**
The Governor's Office of Planning and Research (OPR) will engage local land use authorities, California Native American tribes, and water agencies to amend the general plan guidelines to promote greater consistency between local land use plans and decisions and integrated regional water management plans and decisions. OPR will also work with the Legislature to determine whether water should be a mandatory feature of the general plan guidelines.
- **Legislation for Local and Regional Self Reliance**
The administration will work with the Legislature to encourage local governments to adopt or amend local ordinances that enhance local and regional water supply reliability and conservation, such as ordinances that establish minimum requirements for infiltration or injection of water into the groundwater table, detection and prevention of utility system leaks, landscaping measures, and indoor/outdoor water use efficiency standards.
- **Provide Assistance to Disadvantaged Communities**
The administration will provide technical assistance, tools, and allocate dedicated funds for grant administration, project development, and stakeholder collaboration to under-represented and economically-disadvantaged communities to promote greater participation and success in regional grant programs.

- **Demonstrate State Leadership**

All state agencies should take a leadership role in designing new and retrofitted state owned and leased facilities to increase water efficiency, use recycled water, and incorporate stormwater runoff capture and low-impact development strategies.

- **Encourage State Focus on Projects with Multiple Benefits**

The administration will direct agencies and departments to evaluate existing programs and propose modifications to incentivize and co-fund multi-benefit projects that promote integrated water management, such as stormwater permits that emphasize stormwater capture and infiltration, which provide both flood protection and groundwater recharge benefits, and agricultural groundwater recharge projects that emphasize water quality and conjunctive use. The commitment to emphasize multiple benefit projects will be applied to most of the actions in this plan.

- **Increase the Use of Recycled Water**

California needs more high quality water, and recycling is one way of getting there. The state will adopt uniform water recycling criteria for indirect potable reuse of recycled water for groundwater recharge. Technical and financial assistance will be provided to projects that meet these criteria. The administration will also develop criteria for direct potable reuse and will seek to consolidate the state's recycling programs in the State Water Resources Control Board to promote program efficiencies.

- **Streamline Permitting for Local Water Reuse or Enhancement Projects**

The administration will review and propose measures to streamline permitting for local projects that make better use of local water supplies such as recycling, stormwater capture, and desalination of brackish and seawater as well as projects that provide multiple benefits, such as enhancing local water supplies while improving wildlife habitat.

3. ACHIEVE THE CO-EQUAL GOALS FOR THE DELTA

The Delta is California's major collection point for water, serving two-thirds of our state's population and providing irrigation water for millions of acres of farmland. The region supports farming, wetland and riparian habitats, as well as numerous fish and wildlife species. In recent years, important fish populations have declined dramatically, leading to historic restrictions on water supply deliveries. Moreover, the current system relies on water flowing through a network of fragile levees from the northern part of the Delta to the pumps in the south, where two out of three fish trapped near the pumps die. These levees were not designed to resist a significant seismic event, the probability of which is greater than 60 percent over the next 50 years. They are also vulnerable to major floods and rising sea levels, all of which puts unacceptable risk on the people who live in the Delta as well as the water supply for 25 million people and 3 million acres of farmland. Plans are underway to address these problems. The issues are contentious and have been for decades. But, the status quo in the Delta is unacceptable and it would be irresponsible to wait for further degradation or a natural disaster before taking action.

The Delta Stewardship Council was created in legislation to achieve the state-mandated co-equal goals of providing a more reliable water supply for California and to protect, restore and enhance the Delta ecosystem. Those two goals are to be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource and agricultural values of the Delta as an evolving place. The council recently adopted its Delta Plan and will establish a high-level interagency coordinating body to commence implementation of a suite of actions designed to achieve the co-equal goals. The Implementation Committee can play a strong role in moving forward on the actions included in this plan, which include and build on many of the priorities included in the council's Delta Plan.

- **Begin Implementation of the Delta Plan**

The administration directs all of its relevant agencies to fully participate in the Implementation Committee established by the Delta Stewardship Council and to work with the Delta Science Program, the Interagency Ecological Program, and others to implement the Delta Science Plan to enhance water and natural resource policy and management decisions.

- **Complete Comprehensive Plans to Recover Populations of Threatened and Endangered Species in the Delta and Improve Water Supply Reliability for Users of Delta Water**

State and federal agencies will complete planning for a comprehensive conservation strategy aimed at protecting dozens of species of fish and wildlife in the Delta, while permitting the reliable operation of California's two biggest water delivery projects. The Bay Delta Conservation Plan (BDCP) will help secure California's water supply by building new water delivery infrastructure and operating the system to improve the ecological health of the Delta. It will also restore or protect approximately 145,000 acres of habitat to address the Delta's environmental challenges. The BDCP is made up of specific actions, called conservation measures, to improve the Delta ecosystem. It includes 22 conservation measures aimed at improving water operations, protecting water supplies and water quality, and restoring the Delta ecosystem within a stable regulatory framework. The project will be guided by 214 specific biological goals and objectives, improved science, and an adaptive management approach for operating the water conveyance facilities and implementing other conservation measures including habitat restoration and programs to address other stressors. As the Delta ecosystem improves in response to the implementation of the conservation measures, water operations would become more reliable, offering secure water supplies for 25 million Californians, an agricultural industry that feeds millions, and a thriving economy.

State and federal agencies will complete the state and federal environmental review documents; seek approval of the BDCP by the state and federal fishery agencies; secure all permits required to implement the BDCP; finalize a financing plan; complete the design of BDCP facilities; and begin implementation of all conservation measures and mitigation measures, including construction of water conveyance improvements. Once the BDCP is permitted, it will become part of the Delta Plan.

- **Restore Delta Aquatic and Intertidal Habitat**

In coordination with restoration proposed by the BDCP, a specific set of projects or acreage for restoration will be identified in the six priority areas listed in the Delta Plan: (1) Yolo Bypass; (2) Cache Slough Complex; (3) the confluence of the Cosumnes and Mokelumne rivers; (4) the lower San Joaquin River floodplain; (5) Suisun Marsh; and, (6) western Delta/eastern Contra Costa County. The Department of Water Resources, in consultation and coordination with the Department of Fish and Wildlife, the Delta Science Program, and the Delta Plan Implementation Committee will initiate projects to restore 8,000 acres of intertidal and associated subtidal habitat in the Delta and Suisun Marsh. These agencies will also coordinate with federal agency partners to ensure consistency with federal restoration efforts or requirements.

- **Implement Near-Term Delta Improvement Projects**

In coordination with restoration proposed in BDCP, the Department of Water Resources will initiate a project to remove fish passage barriers within the Yolo Bypass and modify the Fremont Weir to increase the amount and quality of fish rearing habitat by improving access to seasonal floodplain habitat.

- **Maintain Important Infrastructure**

The Department of Water Resources will continue implementation of the Delta Levees Subventions, Delta Special Projects, and Floodway Corridor Programs to provide financial assistance to local agencies for repair and improvement of levees and other multipurpose projects in the Delta.

- **Bay Delta Water Quality Control Plan**

The State Water Resources Control Board will complete its update of the Water Quality Control Plan for the Delta and its upstream watersheds. The plan establishes both regulatory requirements and recommended actions. The State Water Resources Control Board's action will balance competing uses of water including, municipal and agricultural supply, hydropower, fishery protection, recreation, and other uses.

4. PROTECT AND RESTORE IMPORTANT ECOSYSTEMS

Streams and rivers once ran freely from high in the mountains to downstream reaches, meandering naturally through lowland and floodplain habitats, connecting with coastal estuaries and the Pacific Ocean. The variability of natural water flows in this complex system created vibrant and resilient habitat for many species and functioned to store water, recharge groundwater, naturally purify water, and moderate flooding. Over 80 percent of the Central Valley's historical floodplain, riparian and seasonal wetland habitats have been lost in the last 150 years. This loss affects the physical and ecological processes of the Central Valley and beyond, contributes to the decline of salmon and steelhead, restricts habitat for waterfowl and other species, and impacts water supply, flood protection, and sediment control. In watersheds around the state, fish and wildlife no longer have access to habitat or enough cold, clean water at key times of the year. In response to these losses and ecological challenges, as well as in anticipation of the effects of climate change on the timing, volume and temperature of water flows, activities to protect and restore the resiliency of our ecosystems will help support fish and wildlife populations, improve water quality, and restore natural system functions. This effort will increase collaboration and transparency and ensure that management decisions are supported by the best available science.

- **Restore Key Mountain Meadow Habitat**

The Department of Fish and Wildlife, in coordination with other state resource agencies, will restore 10,000 acres of mountain meadow habitat in strategic locations in the Sierra Nevada and Cascade mountain ranges, which can increase groundwater storage and provide habitat for more than 100 native species, many of which are at risk as threatened or endangered. The department will also coordinate with federal agencies, local governments, conservation organizations, tribes, and others as necessary on this action to maximize efforts and avoid duplication.

- **Manage Headwaters for Multiple Benefits**

Watersheds in the Cascades, Sierra Nevada and other forested areas of the state are the places of origin for more than two-thirds of the state's developed water supply. Water originating in the Cascades and Sierra Nevada supplies all or part of the need for 23 million Californians and millions of acres of agricultural land. Up to one-half of the fresh water flowing into the Delta begins as snow and rain in these watersheds.

Many of these crucial watersheds are in poor health due to a number of factors. A changing climate of warmer temperatures will exacerbate the diseases and pests that create additional fire risk and, with more precipitation falling as rain instead of snow, create significant operational challenges for our reservoirs. Large, intense fires such as the recent Rim Fire will produce tons of sediment, much of which will end up in reservoirs, significantly reducing storage capacity and impacting water quality.

In order to reduce the significant risks posed to the water resources flowing from the Cascade, Sierra and other watersheds in the state, there is a critical need to address the following:

- Restore forest health through ecologically sound forest management. Overgrown forests not only pose a risk of catastrophic fire, but can significantly reduce water yield.
- Protect and restore degraded stream and meadow ecosystems to assist in natural water management and improved habitat. Meadows provide a natural storage opportunity, critically important with a changing climate, while properly functioning stream systems reduce downstream sedimentation and enhance critical aquatic habitat.
- Support and expand funding for protecting strategically important lands within watersheds to ensure that conversion of these lands does not have a negative impact on our water resources. By working with willing landowners, protection of key lands from conversion will result in a healthier watershed by reducing polluted runoff and maintaining a properly functioning ecosystem.
- **Bring Back Salmon to the San Joaquin River**
The Department of Fish and Wildlife and the Department of Water Resources will lead the state's effort to achieve the goals of restoring flows to the San Joaquin River from Friant Dam to the confluence of the Merced River, and bring back a naturally-reproducing, self-sustaining Chinook salmon fishery while reducing or avoiding adverse water supply impacts. Chinook will be reintroduced pursuant to the San Joaquin River Restoration Program, and the Department of Fish and Wildlife will complete construction of the conservation hatchery and research facility. The Department of Water Resources will perform activities that support the implementation of channel and structural improvements that result in restoring fish and flows. The administration will work with the Legislature and others to secure further funding as necessary to achieve these activities and the restoration goal.
- **Protect Key Habitat of the Salton Sea Through Local Partnership**
The Natural Resources Agency, in partnership with the Salton Sea Authority, will coordinate state, local and federal restoration efforts and work with local stakeholders to develop a shared vision for the future of the Salton Sea. The Salton Sea is one of the most important migratory bird flyways in North America and is immediately threatened with reduced inflows and increasing salinity. The Department of Fish and Wildlife and the Department of Water Resources will begin immediately to implement the first phase of this effort with the construction of 600 acres of near shore aquatic habitat to provide feeding, nesting and breeding habitat for birds. This project is permitted to increase to 3,600 acres and could be scaled even greater with additional resources. Concurrently, the Natural Resources Agency and the Salton Sea Authority are developing a roadmap for the Salton Sea that will evaluate additional restoration projects and identify economic development opportunities through renewable energy development.
- **Restore Coastal Watersheds**
The Department of Fish and Wildlife in coordination with other state resource agencies and other stakeholders, as appropriate, will develop at least 10 off-channel storage projects, modernize at least 50 stream crossings, and also implement at least 10 large-scale habitat projects along the California coast in strategic coastal estuaries to restore ecological health and natural system connectivity, which will benefit local water systems and help defend against sea level rise.

- **Continue Restoration Efforts in the Lake Tahoe Basin**

California, in partnership with the state of Nevada and the federal government, will continue its efforts to protect the beautiful and unique waters of Lake Tahoe. The Natural Resources Agency will maintain its role in leading the coordination of the state departments, the boards, and the conservancy involved in the bi-state efforts underway to restore, preserve and enhance the Lake Tahoe region. California's restoration efforts at Lake Tahoe include, among other things, support of the Tahoe Regional Planning Agency's implementation of its Regional Plan Update, putting into place the science provisions contained in the recently enacted SB 630, and support for projects contained in the region's Environmental Improvement Program.

- **Continue Restoration Efforts in the Klamath Basin**

The Department of Fish and Wildlife and the Natural Resources Agency will continue to work with diverse stakeholders to implement the Klamath Basin restoration and settlement agreements. Those agreements include measures to improve water quality in the Klamath River, restore anadromous fish runs, including Chinook and Coho salmon, and improve water reliability for agricultural and other uses by providing a drought planning mechanism for low water years. The administration will work with Congress to secure the necessary federal authorizations for the agreements and secure the necessary funding for removal of four hydroelectric dams on the Klamath River and funding for the necessary basin restoration.

- **Water for Wetlands and Waterfowl**

The Department of Fish and Wildlife in coordination with other state resource agencies will develop and implement a water acquisition, management, and water use efficiency strategy in coordination with the U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, Central Valley Project Improvement Act refuge water program, and Central Valley Joint Venture to secure reliable and affordable water for managed wetlands statewide. The administration will work with the Legislature, and others, to secure funding to acquire water and to replace or repair the most in need conveyances for delivering water for wetlands.

- **Eliminate Barriers to Fish Migration**

This action has three parts. First, in coordination with the Central Valley Project Improvement Act Anadromous Fish Screen Program, the Department of Fish and Wildlife will create and publish a Priority Unscreened Diversion List in the Central Valley area. Second, the administration will work with the Legislature and others to secure funding to install or repair the top 10 unscreened diversions on the priority list described above. Third, in smaller watersheds around the state, the Department of Fish and Wildlife will complete a comprehensive analysis, working with other state and federal agencies, to optimize barrier removal projects and river and stream priorities, and then complete culvert and bridge improvement and small dam removal projects to provide anadromous fish species access to historic spawning and rearing habitat.

- **Assess Fish Passage at Large Dams**

The Department of Fish and Wildlife, in coordination with state and federal resource agencies, will develop an evaluation and feasibility process for addressing fish passage at California's rim dams and develop rim dam solution plans for the most feasible locations. Rim dams are the large dams at the base of most major river systems in California. They are too integral to California's water infrastructure to consider removing, but, where feasible, passage around the rim dams may be necessary to recover salmon and steelhead, because 95 percent of the historical habitat for these fish is above the dams. This action will require coordination with local water agencies and dam owners and operators, as well as other stakeholders.

- **Enhance Water Flows in Stream Systems Statewide**

The State Water Resources Control Board and the Department of Fish and Wildlife will implement a suite of individual and coordinated administrative efforts to enhance flows statewide in at least five stream systems that support critical habitat for anadromous fish. These actions include developing defensible, cost-effective, and time-sensitive approaches to establish instream flows using sound science and a transparent public process. When developing and implementing this action, the State Water Resources Control Board and the Department of Fish and Wildlife will consider their public trust responsibility and existing statutory authorities such as maintaining fish in good condition.

- **Achieve Ecological Goals through Integrated Regulatory and Voluntary Efforts**

The San Francisco Bay and Sacramento-San Joaquin River Delta are some of the most studied ecosystems in the nation. Similarly, there are many scientific and management plans about the decline of salmon and steelhead in California. A fundamental ecological principle is that aquatic species and estuarine ecosystems need enough cold, clean water at the right times of year to ensure species abundance and health and ecological function. Integration across and between all voluntary and regulatory efforts may be necessary to truly achieve basic ecological outcomes.

As a goal, the state must continue to consider how to provide water flows necessary to meet current state policy, such as significantly increasing salmon, steelhead and trout populations while also supporting viable, self-sustaining populations of a broad range of other native aquatic species, and ensure sustainable river and estuary habitat conditions for a healthy, functional Bay Delta ecosystem. The administration, with the involvement of stakeholders, will build on the work in tributaries to the Sacramento and San Joaquin rivers, analyze the many voluntary and regulatory proceedings underway related to flow criteria, and make recommendations on how to achieve the salmon and steelhead and ecological flow needs for the state's natural resources through an integrated, multi-pronged approach.

5. MANAGE AND PREPARE FOR DRY PERIODS

Water supply reliability is critical to maintaining California's economy. Temporary shortages caused today by extended, severe dry periods will become more frequent with climate change. Effective management of water resources through all hydrologic conditions will reduce impacts of shortages and lessen costs of state response actions. Many actions will help to secure more reliable water supplies and consequently improve drought preparedness. The actions identified below are specifically designed to address drought conditions and make California's water system more resilient.

- **Revise Operations to Respond to Extreme Conditions**

State natural resources and water quality agencies, in collaboration with their federal counterparts, will implement a series of administrative solutions through a transparent process to make water delivery decisions and propose options to address water quality and supply objectives in extreme conditions. Through these state agencies, the administration will exercise the maximum administrative discretion and flexibility possible to address the current dry conditions now and into 2014. Especially in drought conditions, adaptive management can have substantial fishery, water quality, and water supply benefits. The identification of such opportunities requires continued improved water forecasting and prompt inter and intra agency coordination and communication. It also requires an effective coordination mechanism involving the Department of Water Resources, the U.S. Bureau of Reclamation, the State Water Project and the Central Valley Project contractors, the state and federal fishery agencies, and the State Water Resources Control Board, at a minimum.

- **Streamline Water Transfers**

State agencies, in collaboration with their federal counterparts, will take all feasible steps to streamline water transfer processes to address both extreme situations and normal system operations. These include refining the schedule for the water transfer process, while considering cumulative, ground and surface water and third party impacts; and ensuring that transfers are based on measured water use. The administration will also improve outreach in support of local water transfer programs.

6. EXPAND WATER STORAGE CAPACITY AND IMPROVE GROUNDWATER MANAGEMENT

On average, the state receives about 200 million acre-feet of water per year in the form of rain and snow. In reality, the average rarely occurs, as California has the most variable weather conditions in the nation and climate change may increase the variability. Storage, whether surface storage or groundwater storage, can hold water when it flows heavily for use at times when it does not and create greater flexibility in the system. Above ground (surface storage) can be in the form of large on-stream dams and reservoirs, or smaller on stream and off stream reservoirs. Groundwater storage consists of replenishing groundwater basins either directly through injection, or by allowing water to percolate into the ground naturally or from constructed spreading basins and some forms of stormwater capture. Surface storage can be operated in conjunction with groundwater storage to increase opportunities for groundwater recharge during high flow periods and thereby increase comprehensive water management benefits. Constructing surface storage can be challenging for environmental or financial reasons. Developing groundwater storage can be challenging because many basins are contaminated and this method of storage also requires an ability to measure and withdraw water.

The bottom line is that we need to expand our state's storage capacity, whether surface or groundwater, whether big or small. Today, we need more storage to deal with the effects of drought and climate change on water supplies for both human and ecosystem needs. Climate change will bring more frequent drought conditions and could reduce by half our largest natural storage system—the Sierra snowpack—as more precipitation falls as rain rather than snow, and as snow melts earlier and more rapidly. Moreover, we must better manage our groundwater basins to reverse alarming declines in groundwater levels. Continued declines in groundwater levels could lead to irreversible land subsidence, poor water quality, reduced surface flows, ecosystem impacts, and the permanent loss of capacity to store water as groundwater.

Demand for water goes well beyond water supply and flood management, the traditional purposes for which California's major reservoirs were built. Today, water storage is also needed to help provide widespread public and environmental benefits, such as seasonal fish flows, improved water quality, water cool enough to sustain salmon, and increased flexibility to meet multiple demands, especially in increasingly dry years. The financing of additional water storage in California must reflect not just specific local benefits, but also these broader public benefits.

- **Provide Essential Data to Enable Sustainable Groundwater Management**

The administration will expand and fund the California Statewide Groundwater Elevation Monitoring Program, which provides essential data to characterize the state's groundwater basins, including identifying basins in decline. In coordination with federal, tribal, local and regional agencies, state agencies will conduct groundwater basin assessments and develop assessment reports.

- **Support Funding Partnerships for Storage Projects**

The administration will work with the Legislature to make funding available to share in the cost of storage projects if funding partners step forward. The state will facilitate among willing local partners and stakeholders the development of financeable, multi-benefit storage projects, including working with local

partners to complete feasibility studies. For example, the Sites Project Joint Powers Agreement, formed by a group of local government entities in the Sacramento Valley, is a potential emerging partnership that can help federal and state government determine the viability of a proposed off stream storage project – Sites Reservoir.

- **Update Bulletin 118, California’s Groundwater Plan**

The Department of Water Resources, in consultation with the U.S. Bureau of Reclamation, U.S. Geological Survey, the State Water Resources Control Board, and other agencies and stakeholders will update Bulletin 118 using field data, California Statewide Groundwater Elevation Monitoring, groundwater agency reports, satellite imagery, and other best available science, so that this information can be included in the next California Water Plan Update and be available for inclusion in future water management and land use plans. The Bulletin 118 update should include a systematic evaluation of major groundwater basins to determine sustainable yield and overdraft status; a projection of California’s groundwater resources in 20 years if current groundwater management trends remain unchanged; anticipated impacts of climate change on surface water and groundwater resources; and recommendations for state, federal and local actions to improve groundwater management. In addition, the Bulletin 118 update should identify groundwater basins that are in a critical condition of overdraft.

- **Improve Sustainable Groundwater Management**

Groundwater is a critical buffer to the impacts of prolonged dry periods and climate change on our water system. The administration will work with the Legislature to ensure that local and regional agencies have the incentives, tools, authority and guidance to develop and enforce local and regional management plans that protect groundwater elevations, quality, and surface water-groundwater interactions. The administration will take steps, including sponsoring legislation, if necessary, to define local and regional responsibilities and to give local and regional agencies the authority to manage groundwater sustainably and ensure no groundwater basin is in danger of being permanently damaged by over drafting. When a basin is at risk of permanent damage, and local and regional entities have not made sufficient progress to correct the problem, the state should protect the basin and its users until an adequate local program is in place.

- **Support Distributed Groundwater Storage**

The administration will support a comprehensive approach to local and regional groundwater management by funding distributed groundwater storage projects that are identified in groundwater management plans and removing barriers to implementation.

- **Increase Statewide Groundwater Recharge**

The administration will work with the Legislature to discourage actions that cause groundwater basin overdraft and provide incentives that increase recharge. State agencies will work with tribes and federal, regional and local agencies on other actions related to promoting groundwater recharge and increasing storage, including improving interagency coordination, aligning land use planning with groundwater recharge, and identifying additional data and studies needed to evaluate opportunities, such as capturing and recharging stormwater flows and other water not used by other users or the environment.

- **Accelerate Clean-up of Contaminated Groundwater and Prevent Future Contamination**

Throughout the state, groundwater basins are contaminated by historic manufacturing, farming practices and other current uses. The State Water Resources Control Board and the Department of Toxic Substances Control will develop recommendations and take action to prevent the spread of

contamination, accelerate cleanup, and protect drinking water in urban areas. The State Water Resources Control Board will continue to implement appropriate control measures to address these sources through its water quality permitting authority.

7. PROVIDE SAFE WATER FOR ALL COMMUNITIES

All Californians have a right to safe, clean, affordable and accessible water adequate for human consumption, cooking, and sanitary purposes. Disadvantaged communities, in particular, often struggle to provide an adequate supply of safe, affordable drinking water. The reasons for this are numerous: changes in drinking water quality standards, pollution, aging infrastructure, lack of funding for basic infrastructure, lack of funding for ongoing operation and maintenance, and unreliable supplies resulting in service interruptions are among the most common. Programs designed to protect the quality of our waters for drinking and other uses are housed in multiple agencies, reducing their effectiveness and ability to meet communities' needs.

- **Consolidate Water Quality Programs**

The administration is pursuing consolidation of the drinking water and surface and groundwater quality programs into a single agency to achieve broader program efficiencies and synergies that will best position the state to respond to existing and future challenges. This initiative will also better restore and protect water quality and public health for disadvantaged communities.

- **Provide Funding Assistance for Vulnerable Communities**

The administration will work with the Legislature to establish a stable, long-term funding source for provision of safe drinking water and secure wastewater systems for disadvantaged communities. The funding will be made available through a framework of statutory authorities for the state, tribes, regional organizations, and county agencies that will assess alternatives for providing safe drinking water and wastewater, including regional consolidation, and to develop, design, implement, operate and manage these systems for small disadvantaged communities impacted by contaminated drinking water and lack of sanitary wastewater infrastructure.

- **Manage the Supply Status of Community Water Systems**

The state will identify drought-vulnerable public water systems and monitor the status of these systems to help prevent or mitigate any anticipated shortfalls in supply and to secure alternative sources of water for the communities when needed. The state will also work with local governments and agencies to identify drought-vulnerable areas served by domestic wells and collaborate to prevent or mitigate any anticipated shortfalls.

8. INCREASE FLOOD PROTECTION

California's exposure to flood risk presents an unacceptable threat to public safety, infrastructure, and our economy. More than 7 million people and \$580 billion in assets are exposed to flood hazards in the state and the lack of sufficient and stable funding for flood management exacerbates the state's risk.

When California floods, public safety and health is endangered, critical infrastructure is damaged, vital services become isolated or interrupted, vast agricultural areas are rendered unproductive, and water supplies are threatened or impacted. The effects of climate change on the state's water runoff patterns will magnify these challenges. Actions by state, local, tribal and regional governments, however, can reduce flood risks and improve

the state's preparedness and resiliency when flooding inevitably occurs. Flood projects done in an integrated, regionally-driven way can also achieve multiple benefits. It is possible through collaborative planning efforts to integrate our flood and water management systems, and implement flood projects that protect public safety, increase water supply reliability, conserve farmlands, and restore ecosystems.

- **Streamline and Consolidate Permitting**

The administration will convene a task force of federal, state and local permitting and flood management agencies, to develop a programmatic regulatory permitting process to replace current site-by-site mitigation requirements and expedite permitting of critical maintenance activities and flood system improvement projects. The effort to streamline and consolidate will also incorporate regional advanced mitigation as a means to expedite planning.

- **Create a Delta Levee Assessment District**

The administration, in consultation with the Delta Protection Commission and the Department of Water Resources, will sponsor legislation establishing a Sacramento-San Joaquin River Delta levee assessment district with authority to collect fees needed to repair and maintain more than 1,000 miles of Delta levees, many of them privately constructed before modern engineering standards were in place.

- **Improve Access to Emergency Funds**

The administration will sponsor legislation revising the California Disaster Assistance Act to enhance the Governor's Office of Emergency Services' ability to advance funds for flood response efforts in close coordination with the Department of Water Resources.

- **Better Coordinate Flood Response Operations**

The Governor's Office of Emergency Services, working in coordination with the Department of Water Resources, the U.S. Army Corp of Engineers, and others, will develop and implement a common interagency protocol that all jurisdictions and agencies at all levels of government operating in the Delta in an emergency will use to establish joint field incident commands for flood operations and other emergency response functions.

- **Prioritize Funding to Reduce Flood Risk and Improve Flood Response**

An estimated \$50 billion is needed to reduce flood risk statewide. The administration will focus on the highest risk areas and develop proposals to fund projects through a combination of financing options.

- **Identify State Funding Priorities for Delta Levees**

The Delta Stewardship Council, in consultation with the Department of Water Resources, the Central Valley Flood Protection Board, the Delta Protection Commission, local agencies, and the California Water Commission, should develop funding priorities for state investments in Delta levees. These priorities will be consistent with the provisions of the Delta Reform Act in promoting effective, prioritized strategic state investments in levee operations, maintenance, and improvements in the Delta for both levees that are a part of the State Plan of Flood Control and non-project levees.

- **Encourage Flood Projects That Plan for Climate Change and Achieve Multiple Benefits**

State agencies engaged in planning and implementing flood projects, such as those outlined in the Central Valley Flood Protection Plan, will factor in the effects of climate change as well as pursue projects that provide the greatest number of benefits in addition to flood and public safety. Projects should be developed in a manner that anticipates the extremes that are predicted to worsen due to climate change, and pursue multiple benefits as a climate adaptation strategy like increasing water supply reliability,

giving rivers more room to move through widening floodways, conserving farmlands, and restoring ecosystems.

9. INCREASE OPERATIONAL AND REGULATORY EFFICIENCY

Efficiently operating the State Water Project and Central Valley Project, while complying with the requirements of state and federal endangered species acts and operating consistent with the conditions of water rights, contracts and other entitlements, is a delicate balancing act. Current coordination efforts, while longstanding and intended to cover a broad range of conditions, do not reflect the entire Delta watershed, nor do they effectively integrate all of the activities that other agencies and organizations are undertaking to improve the ecosystem.

- **Prepare for 2014 and Beyond Through Better Technology and Improved Procedures**

The administration will work with federal and regional counterparts to improve coordination of operations of all major water supply (storage facilities and direct diversions), flood control, hatchery facilities, and habitat restoration projects to improve water supply and fishery conditions. The goals are to improve water project near-term operational flexibility for water year 2014 and build upon those actions in subsequent years. Better technology can result in improved coordination and more accurate data for decision making. Examples of better technology and improved coordination include but are not limited to the following:

- Improve data availability, communication procedures, and analytical methods used to monitor and communicate risks to listed fish species and to water supplies when making regulatory decisions associated with implementation of incidental take provisions in the existing biological opinions.
- Develop a pilot project to test if a new index for Old River and Middle River reverse flows enables compliance with biological opinion requirements.
- Develop and employ new turbidity models to improve real-time turbidity management in the south Delta.
- Analyze through the South Delta Science Collaborative associated operational approaches for minimizing loss of salmon in the area of the Old River barrier and effects of the operations on water supply.
- Develop a Delta smelt life cycle model to help manage operations to avoid entrainment of smelt at the water project's intakes.
- Implement a 3.5-year study to enhance and modernize Delta smelt monitoring (fish abundance and geographic distribution in the Delta), to improve the ability to protect fish populations while minimizing the impacts of fish protective measures on water project operations.
- Work with federal agencies to improve coordination of hatchery fish releases with hydrologic conditions and water project operations to improve fish survival.
- Improve state and federal interagency coordination and water contractor coordination on real-time forecasting and management associated with meeting water quality control objectives, to optimize project operations and avoid redirected fishery impacts.

- Fund and revive the National Hydrological Dataset for California to improve high-quality framework geospatial data and the precision and accuracy of mapping and scientific studies.
- **Improve and Clarify Coordination of State Bay Delta Actions**
The problems affecting the Delta need to be addressed on multiple fronts, including habitat loss, export conveyance, water projects operations, pollution control, and flows. The principal state entities charged with addressing these issues are the Delta Stewardship Council, Department of Water Resources, Department of Fish and Wildlife, and the State Water Resources Control Board. Several federal agencies exercise regulatory authority related to these issues. There are also multiple water districts, private parties, nongovernmental organizations and tribal communities with a profound stake in these issues.

A coordinated approach to managing the Delta is essential to serve the needs of California’s residents. State agencies will commit to using collaborative processes to achieve water supply, water quality and ecosystem goals. This approach embraces enhanced sharing of data, consistent use of peer-reviewed science, coordinated review under the California Environmental Quality Act, improved integration of related processes, and encouragement of negotiated resolutions.

- The Delta Stewardship Council, Department of Water Resources, Department of Fish and Wildlife, and the State Water Resources Control Board will ensure all relevant information is shared and will assist each other, as appropriate, to complete respective efforts to improve Delta conditions.
- State entities will encourage negotiated agreements among interested parties to implement flow and non-flow actions to meet regulatory standards and support all beneficial uses of water. State staff will participate in these processes to the maximum extent possible when requested.
- The Delta Stewardship Council’s Implementation Committee, which includes leaders from all the affected state entities, will meet regularly to review progress in coordination.
- The administration will direct relevant agencies and departments to work with the Delta Science Program, the Interagency Ecological Program, and others conducting science in the Delta to implement the Delta Science Plan, committing resources and funding for shared science to achieve integrated, collaborative and transparent science to enhance water and natural resource policy and management decisions.

10. IDENTIFY SUSTAINABLE AND INTEGRATED FINANCING OPPORTUNITIES

California has a long history of making sound financial investments in water resources. However, our current investments are not keeping pace with the need. Our infrastructure is aging, levees are in need of repair, communities are without safe water, and our environment, farms and economy are suffering from unreliable and degraded water supplies. The effects of climate change will only accelerate the challenges facing our water resources and infrastructure. This plan includes actions that will require multiple funding sources. We have access to a variety of funding sources including federal grants and loans, general obligation bonds, revenue bonds, rate payer dollars, local initiatives, user fees, beneficiary fees, local and statewide taxes, private investment, public-private partnerships, and more. A better understanding of the variety and types of funds and financing available for water investment will help us to make the best, most efficient and sustainable uses of the funding available.

- **Remove Barriers to Local and Regional Funding for Water Projects**
The administration will work to clarify the 1996 Right to Vote on Taxes Act's (Proposition 218) applicability to water related fees and taxes, including sponsoring legislation if necessary.
- **Develop Water Financing Strategy**
The administration will develop a water financing strategy that leverages various sources of water-related project funding and proposes options for eliminating funding barriers, including barriers to co-funding multi-benefit projects. The strategy will identify all potential funding sources for water-related projects including cap and trade auction revenue under AB 32, energy efficiency funds, user and beneficiary fees, polluter fees, local measures, and other sources and will establish principles to guide the use of these funding sources. The strategy will consider measures for energy efficiency and renewable energy to achieve greenhouse gas reductions that would be a co-benefit of water infrastructure investments.
- **Analyze User and Polluter Fees**
The administration will direct agencies to identify areas where user and/or polluter fees may be appropriate. The agencies will assess the following: areas where users may not be fully funding the costs or impacts associated with their use, instances where polluters are not able to diminish their pollution and have not adequately accounted for the impacts of that pollution, and opportunities to use fees to incentivize positive behavior. The agencies will provide recommendations on fees, who would pay them, how they would be collected, and how they would be used.

Conclusion

All Californians have a stake in our water future. These actions set us on a path toward reliability, restoration, and resilience in California water. We must adapt to this “new normal” and recapture California’s resource management leadership and our economic and environmental resilience and reliability. There are no silver bullets or single projects that will “fix the problem.” We must have a portfolio of actions to comprehensively address the challenges this state faces. Some actions must be taken immediately to address current risks such as the looming drought and inadequate safe drinking water. Additionally, over the next five years, we must address fundamental changes in our approach to water resource management and be prepared for the changes the future holds.

**Central Valley Project and State Water Project
Drought Contingency Plan
January 15, 2015 – September 30, 2015**

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**Central Valley Project and State Water Project
Drought Contingency Plan
January 15, 2015 – September 30, 2015**

This Drought Contingency Plan (DCP) is prepared by the U.S. Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR), by working with U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and California Department of Fish and Wildlife (CDFW) (collectively “the Agencies”). This DCP is submitted to the State Water Resources Control Board (SWRCB) on January 15, 2015, as required by the SWRCB’s final Temporary Urgency Change Order dated October 7, 2014. This DCP will be updated as necessary based on changing circumstances, which could include additional proposed modifications to SWRCB permit requirements. Most importantly, the DCP, as described below, is based upon hydrologic conditions as of January 1, 2015, thus we anticipate changes in drought response actions as the year’s hydrology unfolds.

The Agencies prepared an “Interagency 2015 Drought Strategy for the Central Valley Project and State Water Project” (2015 Drought Strategy) which was released as a working draft on December 12, 2014. A copy of the 2015 Drought Strategy is included with this DCP for ease of reference (See Reference 1). The 2015 Drought Strategy describes the anticipated coordination, process, planning and potential drought response actions for 2015. Not all of those actions are described specifically in this DCP, which is focused on articulating anticipated proposed modifications to SWRCB permit requirements. Other actions described in the 2015 Drought Strategy, as well as additional actions that may be proposed by stakeholders, will continue to be considered and analyzed by the Agencies for possible implementation in 2015.

I. Introduction and Purposes of the DCP

The State’s December 30, 2014, snow survey found a Sierra Nevada snowpack that is less than half of normal in terms of the amount and water content for this time of year. Furthermore, although November and December 2014 storms brought much needed precipitation, after three dry years, the State’s overall water storage levels remain far below average. Adequate storage is needed throughout the year and especially in dry times of the year in order for the Central Valley Project (CVP) and State Water Project (SWP) to supply human needs, continue repelling saltwater in the Delta, and provide for cold water needs of Chinook salmon. On January 17, 2014, California’s Governor issued a drought State of Emergency proclamation. Nearly one year later, drought conditions and the Governor’s proclamation remain in place. Over the last year and a half, Reclamation and DWR have worked closely with the fish and wildlife agencies to develop operational and contingency plans, as well as real-time coordinated operations and monitoring, in order to responsibly manage our State’s limited water supplies.

A. Purpose of the DCP

Since December 2013, State and federal agencies that supply water, protect fish and wildlife, and regulate water quality, have worked together to balance water supply, biological protections, and water quality during this drought. Following the Governor's emergency drought proclamation, on January 29, 2014, Reclamation and DWR sought a temporary modification to their water rights permits and licenses to respond to the drought conditions. On January 31, 2014, the Executive Director of the SWRCB issued an Order that granted temporary modification to Water Rights Decision 1641 (D-1641).

According to the petition and subsequent acknowledgement in the Order, Reclamation and DWR convened a Real Time Drought Operations Management Team (RTDOMT) comprised of representatives from Reclamation, DWR, State and federal fish and wildlife agencies, and the SWRCB to discuss more flexible operations of the Projects while protecting beneficial uses. Together, these agencies worked through existing statutory and regulatory obligations so that water operations could adjust quickly to changes in the weather and environment to support and improve water supply deliveries when possible while protecting water quality and fish and wildlife as required under state and federal laws and permits. The RTDOMT agencies recognize the importance of their efforts to minimize potential impacts from drought to provide food security, economic stability, and species protection in California.

It is difficult under these very dry conditions, and low reservoir storages, to balance the multiple critical uses of the limited water supplies. The purpose of this DCP is to provide an overview of current conditions in the CVP and SWP operated reservoirs and the Delta related to salinity and threatened fisheries, as well as an overview of available supplies for multiple beneficial uses as they relate to projected flow and storage conditions using 50%, 90%, and 99% exceedence probabilities for assumed hydrology. This DCP addresses projected water operations based on various hydrologic scenarios and potential adjustments to regulatory requirements through September 30, 2015.

The primary goals of this DCP are to:

1. Operate the CVP and SWP during this extreme drought to provide for, at a minimum, essential human health and safety needs throughout the CVP and SWP service areas, and preferably to minimize water supply shortages that harm the State's economy.
2. Control saltwater intrusion in the Sacramento-San Joaquin Delta by providing enough fresh water flow out of the Delta throughout dry months to repel saltwater that pushes inland on ocean-driven tides from San Francisco Bay.
3. Preserve enough cold water deep in Shasta Lake and other reservoirs to maintain cool river temperatures for various runs of Chinook salmon.
4. Maintain protections for State and federally endangered and threatened species and other fish and wildlife resources that are suffering from unavoidable impacts due to a drought of this magnitude and necessary drought-related actions.

B. Critical Operational Considerations

The operational forecasts developed for this DCP are designed to make the most efficient use of the limited water resources in 2015 for multiple beneficial uses while managing the potential risks of continued drought conditions into next year. There are three main objectives of this DCP. First, to continue operation of the Delta pumping facilities, taking advantage of opportunities to export natural or abandoned flow while maintaining Delta water quality and providing adequate protections for listed fish. Second, to conserve reservoir storage for use later in the water year. Third, to manage reservoir releases from June through September to concurrently benefit in-stream temperature objectives, meet Sacramento Valley in-basin needs and other water supplies, and preserve carry-over storage. This DCP includes considerations on how the Projects propose to generally operate under different hydrologic conditions, but the actual operation is still uncertain at this time because of changing hydrology. The hydrologic scenarios used in this DCP are discussed in the Projected Hydrology and Runoff section later in the document.

A key consideration is that even if the overall hydrology significantly improves this year, the water supply system, particularly in regions south of the Delta, is in a severely depleted state. The ability to deliver water south of the Delta is important to support health and safety, municipal and industrial, and refuge needs as well as to help communities and the State economy to recover from the severe dry conditions from the past several years.

The following are the Projects' critical operational considerations and objectives under on-going drought conditions.

i. Health and Safety

During this continuing drought, operations of the CVP and SWP must provide for, at a minimum, essential human health and safety needs throughout the CVP and SWP service areas, and retain the capability to provide for such minimum needs throughout water year (WY) 2015 and WY2016 if drought conditions continue. For clarity, Reclamation and DWR's consideration of these essential human health and safety needs includes adequate water supplies and water quality for drinking water, sanitation, and fire suppression, but does not extend to other urban water demands such as outdoor landscape irrigation. While most Californian communities may have reserve water supplies, some communities will require continued delivery of limited amounts of water through the CVP and SWP systems to meet these basic needs.

At DWR's request, the 29 public water agencies that contract for water from the SWP quantified their needs to meet demands for drinking, hygiene, and sanitation (collectively 55 gallons per capita per day (gpcd)), plus fire protection. Most SWP contractors have alternative sources of water, including groundwater and local reservoirs. The combined initial estimated need that DWR received from its contractors this past October was approximately 330 thousand acre-feet

(TAF) for calendar year 2015. Those needs are expected to fluctuate based on changes in availability from other sources.

Reclamation currently uses its draft Municipal and Industrial (M&I) Water Shortage Policy (Draft Policy) to determine the amount of water to be provided to its M&I contractors in those years where human health and safety needs govern CVP allocations to these contractors. Under these conditions, M&I contractors are required to update population estimates and non-CVP water source information to determine how much water will be needed from the CVP to meet their overall human health and safety demand for that year. The vast majority of CVP contractors throughout the entire service area that receive M&I water from the CVP have other available supplies to help meet their demand. Based upon application of the Draft Policy approximately 180 TAF of CVP water was allocated in WY2014 to help meet their health and safety needs with consideration of other available supplies. For WY2015, Reclamation intends to again apply the Draft Policy to determine the amount of CVP water available to meet health and safety needs. For planning purposes the 180 TAF is a reasonable estimate of minimum CVP M&I needs for WY2015 if dry conditions continue, however it is anticipated these needs may fluctuate based on changes in availability from other sources.

ii. Economic Impacts

Throughout the continuing drought, CVP and SWP systems will be operated to lessen critical economic losses to agriculture, municipal, and industrial uses due to water shortages through project water deliveries and by facilitating voluntary water transfers and exchanges to the extent possible, while balancing the needs of upstream storage, fishery and wildlife resource protection, and operational flexibility. A key to minimizing water supply shortages for economic purposes will be to take advantage of opportunities to export natural or abandoned flow in the winter and spring while maintaining Delta water quality and minimizing adverse effects to listed fish. Release of stored water in summer and fall will be managed to concurrently benefit in-stream temperature and wildlife objectives, meet Sacramento Valley in-basin needs, convey water south-of-Delta to meet water supply needs, and preserve system reservoir carry-over storage to meet objectives in WY2016.

iii. Fishery and Wildlife Protection

The CVP and SWP operations outlined in this DCP will continue to maintain protections for endangered species and other fish and wildlife resources that are suffering from unavoidable impacts due to drought and drought-related operations. The 2015 Drought Strategy calls out some elements that could be modified in order to balance all needs, while providing protections required by law. Any changes in operations that are ultimately proposed by Reclamation and DWR either through a Temporary Urgency Change Petition (TUCP) or under the Endangered Species Act (ESA) will be submitted by Reclamation and DWR for concurrent review under applicable laws, including the Federal ESA (FESA), California ESA (CESA), and the California Water Code.

A goal of this DCP for operations this spring through fall is to identify a balanced approach to meeting river temperatures, instream flows, and Delta protective actions. A primary consideration involves the need to conserve enough cold water in Project reservoirs early in the year to maintain cool water temperatures in the Sacramento River and tributaries to support the various runs of Chinook salmon and steelhead. If conditions remain dry, these same water supplies may be needed to provide for other critical operational considerations throughout 2015. The timing, flow rate, and rate of any flow changes for instream fishery needs will also vary with storage and hydrologic conditions.

iv. Refuge Water Supplies

One of the requirements of the Central Valley Project Improvement Act (CVPIA) passed by Congress in 1992 included providing water for state, federal and private managed wetlands in order to maintain and improve wetland habitat areas. This DCP includes plans to provide water in order to keep conveyance channels charged; support seasonal, riparian, permanent and semi-permanent wetlands; and to provide critical ESA habitat for protected species, such as the Giant Garter Snake and Tri-Colored Blackbird, for both north and south of the Delta refuges. Deliveries for summer, fall, and winter water will be consistent with the schedules submitted by the refuges and adjusted as allocations are modified.

Refuge water supply contracts also allow for reallocation of Level 2 supplies between and among refuges to improve supply flexibility, coordination, and management between Reclamation and wetland managers, and to lessen impacts to other water users.

For south of Delta refuges, when total demand from direct diversions from the Delta are not feasible, water from San Luis Reservoir can be made available to meet refuge needs. The CVPIA and refuge water supply contracts allow for flexibility to transfer water from refuges both within basin as well as north of the Delta to south of the Delta. Water transfers from north of Delta refuges to south of Delta refuges would occur to support priority habitat needs of south of Delta refuges given available capacity to facilitate the transfer. This water could be directly diverted or stored in San Luis Reservoir and used when most needed by south of the Delta refuges.

Level 2 represents a baseline of water supply needed to manage refuge wetlands. To maximize the quality and extent of habitat with a limited water supply, system operators will strive to deliver refuge water in accordance with refuge manager schedules and in conjunction with any Incremental Level 4 water supplies. System operators will work with refuge managers to deliver summer water and to transfer, reallocate, or exchange refuge water supplies to meet management and biological needs. Absent summer water deliveries to south of Delta refuges, critical habitat for Giant Garter Snake remains dry or extremely restricted because of water quality constraints and wetlands cannot produce essential forage needed for fall and winter migratory birds.

CVPIA refuge managers will be involved regularly throughout the water supply reevaluation and adjustment process. Refuge deliveries are included in CVP operational scenarios and forecasts, and calculations regarding anticipated reservoir levels into the late fall and early winter. The Agencies will continue to work together with water districts and non-governmental organizations to identify opportunities for delivery flexibility to accommodate management of water quality and the needs of salmonids and smelt at different life stages while minimizing impacts to Project and refuge operations.

v. Operational Flexibility

An underlying objective of this DCP is to maximize regulatory flexibility of Project operations while still remaining within existing law and regulations. Maximizing such flexibility allows Project operators to adjust quickly to changes in the weather and environment and to maximize the beneficial use of water to the greatest extent possible within the law. This goal of improving water supply includes facilitating water transfers for municipal and industrial, refuge, and agriculture to ensure the most critical supply needs are met throughout the service areas of the CVP and SWP and ensuring flow standards are as flexible as possible in order to capture multiple storm events under the otherwise dry conditions. This flexibility allows for Reclamation and DWR to improve upstream reservoir storage and deliver maximum available water supplies.

II. Initial Status of Conditions

A. Water Quality

Overall water quality in the Delta is much improved since the October 15, 2014 Drought Contingency Plan was submitted due to the above average precipitation in northern California during December. Salinity conditions are likely to remain manageable through January regardless of precipitation patterns. Conditions will continue to be monitored and Delta pumping may be reduced if necessary to increase Delta outflow to levels sufficient to manage salinity intrusion. If Delta Cross Channel (DCC) gates are open and exports are reduced to minimum health and safety requirements and conditions continue to trend dry, then the Project operators will carefully consider augmentation of Delta inflow with additional releases from upstream reservoirs. However, increasing inflows is not particularly effective in influencing south Delta water quality when the DCC gates are not opened.

The Projects do not anticipate opening the DCC gates in January, however, Reclamation and DWR would request opening the DCC gates before proposing any modifications to D-1641 Table 1 salinity objectives for M&I beneficial uses and Table 2 objectives for beneficial uses in the export area. This is because exceedences of these existing water quality objectives would elevate risk to public health as a result of disinfection byproducts related to the treatment of degraded water quality constituents potentially increasing beyond permissible contaminant levels.

B. SWP and CVP Upstream Reservoir Storage

In the Sacramento River watershed, storage in upstream reservoirs still remains well below average for this time of year. Lake Oroville as of January 14, 2015 storage was about 1.40 million acre-feet (MAF) (39% of capacity and 62% of historical average). Lake Shasta as of January 14, 2015 storage was about 1.93 MAF (42% of capacity and 66% of historical average), and Lake Folsom as of January 14, 2015 storage was approximately 444 TAF (45% of capacity and 91% of historical average).

In the San Joaquin watershed, storage in New Melones Reservoir was 552 TAF, which is just 23% of capacity and 39% of historical average and about half the storage at that time last year.

C. Biology

i. Salmonids

DWR and Reclamation operate to the 2009 NMFS Biological Opinion. DWR also operates under a consistency determination from CDFW on the Biological Opinion. As of January 14, 2015, the preliminary estimate of natural juvenile winter-run Chinook salmon emigration past the Red Bluff Diversion Dam is 402,529 based on USFWS rotary screw trap monitoring. To put this in perspective, this is less than half of the juveniles that resulted from broodyear 2011 when only approximately 824 adult winter-run returned to spawn. In addition, in anticipation of considerable water temperature impacts to incubating winter-run eggs and alevin, the Livingston Stone National Fish Hatchery (LSNFH) increased its winter-run broodstock collection to 388 adults, over triple the typical limit of 120. There are currently approximately 650,000 juvenile hatchery winter-run rearing at LSNFH and awaiting release in January or February.

As of January 13, 2015, the Delta Operations for Salmon and Sturgeon (DOSS) Team estimated the following distribution of winter-run and spring-run Chinook salmon:

Location	Yet to Enter Delta (Upstream of Knights Landing)	In the Delta	Exited the Delta (Past Chipps Island)
<i>Young-of-year (YOY) winter-run Chinook salmon</i>	< 5% (last week: same)	> 95% (last week: same)	< 5% (last week: same)
<i>YOY spring-run Chinook salmon</i>	50% - 75% (last week: ~50%)	25% - 50% (last week: ~50%)	< 5% (last week: same)
<i>Yearling spring-run Chinook salmon*</i>	< 5% (last week: same)	80% - 90% (last week: same)	< 15% (last week: same)

* No yearling spring-run Chinook salmon have been caught in 2014 monitoring. In general, very few yearling spring-run Chinook salmon are observed because of their relatively large size and strong swimming (and associated gear avoidance) abilities.

As of January 13, 2015, the WY2015 total for combined wild winter-run loss is 70, and the combined wild steelhead loss is 17.

ii. Delta Smelt

DWR and Reclamation operate to the 2008 USFWS Delta Smelt Biological Opinion. DWR also operates under a consistency determination from CDFW on the Biological Opinion. The Smelt Working Group (SWG) began meeting in late November to discuss current-year conditions. The 2014 Fall Midwater Trawl was completed in December; the computed index was 9, a new historic low. A special Spring Kodiak Trawl survey was completed in the third week of December 2014 to more precisely identify distribution of adult Delta Smelt. It revealed that most of the fish are likely in the Sacramento River portions of the estuary, especially the confluence region. In addition, two Delta Smelt were observed at Survey Station 815 (Prisoners Point) on the lower San Joaquin River. Early warning Delta Smelt monitoring at Jersey Point and Prisoners Point in the lower San Joaquin River began on December 1, 2014 and was conducted daily (to the extent conditions permitted) through January 5, 2015. Early warning Delta Smelt monitoring revealed an increase in Delta Smelt density at both locations in the latter half of December, indicating that storms in December had stimulated movement of Delta Smelt into the fresher water portions of the estuary. The special December Spring Kodiak Trawl was conducted during the series of storms that occurred, and likely partially reflects a post-storm distribution of fish. As of January 13, 2015 an expanded total of 56 adult Delta Smelt have been observed in salvage.

iii. Longfin Smelt

DWR operates to the 2009 Longfin Smelt Incidental Take Permit (ITP) issued by CDFW. In WY2014 juvenile Longfin Smelt were only observed at the salvage facilities between February and April. Salvage data from WY1994 through WY2014 indicate that salvage of adult Longfin Smelt is rare, and typically occurs between the months of December and February. Additionally, the majority of Longfin Smelt salvage typically occurs after February when juvenile fish rearing in the south and central Delta have grown large enough to be effectively screened by the fish collection facilities. As of January 13, 2015 no Longfin Smelt have been salvaged in WY2015 and none were detected in the central or south Delta during the December Fall Midwater Trawl or supplemental Spring Kodiak Trawl. Late December 2014 catches by the Chipps Island trawl suggested that spawning movement into the western Delta is currently ongoing, which was further confirmed through the “Early Warning Sampling” at Prisoner’s Point catching 2 ripe Longfin Smelt adults on January 4, 2015. The first Smelt Larvae Survey of January 2015 detected one larvae on the Lower San Joaquin River and two larvae in the Cache Slough complex (with 18 of 32 stations results processed). The CDFW through the SWG tracks distribution and salvage to assess risk and make appropriate operational recommendations consistent with the Longfin Smelt ITP.

iv. Refuge Water Supply

The CVPIA Refuge Water Supply Program supports 19 managed wetland areas. These areas are strategically located across the Central Valley to provide the core critical wetland habitat for migratory birds and wetland dependent wildlife, including threatened and endangered species such as the Giant Garter Snake and Tri-Colored Blackbird. The amount of flooded acreage in

most refuges is currently near average. This increase in flooded acres was due to the recent rain events and storm water flows associated with the December rainstorms. However, the dry January is leading to rapidly decreasing flooded acreages. January is within the peak season where as many as 5,000,000 waterfowl might be in the Central Valley. The decision to forgo summer irrigations during WY2014 has resulted in decreased forage availability and its expected food resources will be depleted in the near future. Monitoring is ongoing to track body condition and bird distribution.

Wetland habitats in the Central Valley are critical to different life stages of resident and migratory birds and resident wildlife, including threatened and endangered. Fall and winter wetlands are critical for waterfowl and other migratory birds. Summer wetlands are critical for Giant Garter Snake, Tri-Colored Blackbirds, breeding waterfowl, etc. Summer conditions continue to decline with the ongoing drought as evidenced by the continued decline of breeding waterfowl and tri-colored blackbirds in the Central Valley. While fall and winter conditions ended up well above expectation given private wetland acreages and flooded agriculture in the Sacramento Valley, not all regions of the Central Valley fared as well. Wetland conditions on private land mirrored the refuges as described above, whereas further south there is less habitat available, resulting in less habitat value and bird production.

III. Projected Hydrology and Runoff

The DWR's Hydrology and Flood Operations Office within the Division of Flood Management produces estimates of water year runoff for the major watersheds of the Sacramento and San Joaquin River basins beginning in January and updates these as part of the Department's Bulletin 120 update process from February through May of each year. The runoff forecasts utilized for this DCP are informed by precipitation, snowpack, runoff and other antecedent hydrologic conditions as they existed on January 1, 2015. These forecasts combine runoff associated with antecedent conditions with anticipated runoff resulting from precipitation predicted to occur for the remainder of the year under the 50%, 90%, and 99% hydrologic exceedence scenarios. For example the 90% exceedence hydrology assumes inflows from rainfall and snowmelt at levels that are likely to be exceeded with a 90% probability, or in other words, there is a 10% or less chance of actual conditions turning out to be this dry or drier from this point forward. The 50% probability is the 50/50 assumption - it is just as likely to be drier or wetter.

Operations forecasts utilize the hydrologic forecasts as inputs to simulate Project operations under various regulatory constraints and produce forecasted reservoir storages, releases, flows, and deliveries under the same set of hydrologic exceedences. These operations forecasts give general guidance for annual water delivery, storage management, and power planning purposes for each exceedence assumption. Actual hydrologic events act in time steps shorter than a month and are often unpredictable more than a few days to a week out. Day-to-day operations are also influenced by operating criteria such as those found in U.S. Army Corps of Engineers flood control manuals, D-1641, and the Biological Opinions. Output from forecast models as provided in this DCP represent system responses to the overlay of very specific operating

criteria on a generic set of hydrologic scenarios. These operations forecast updates are generally completed by the third week of the month.

IV. Operations Forecasts - Projected Supplies, Releases and Storage

The operational forecasts are based on a model using the January 1, 2015 50%, 90% and 99% hydrology. The base assumptions utilize existing storage conditions, actual precipitation and runoff occurred to date, forecasted precipitation based on the hydrology, projected water supply deliveries, and meeting existing water quality standards and fish and wildlife protections. The 99% hydrology scenario assumes the installation of emergency drought barriers will be necessary.

Under all the hydrologic scenarios, the model assumes fulfilling the contractual obligations between DWR and North Delta Water Agency. For the Feather River Settlement Contractors, no shortage provision is assumed under the 50% and 90% hydrology scenario, while the contractual 50% shortage provision is assumed to be triggered under the 99% hydrology. A final determination of the delivery to the Feather River Settlement contractors would be made based on the April forecasts. Deliveries to Sacramento River contractors and San Joaquin River Exchange contractors are not explicitly identified in these forecasts. Reclamation will be evaluating available supplies to these contractors based on February forecast projections.

The storage and flows under the January 1, 2015 50%, 90%, and 99% hydrologic scenarios are included in Attachment 1. The January 1, 2015 50%, 90%, and 99% exceedance scenarios were selected to show the likely ranges of hydrology for potential future conditions.

V. Projected D-1641 TUCP Requests

A. Summary Table

The Summary Table, included in Attachment 2, outlines the D-1641 Bay-Delta Standards with likely 2015 TUCP Requests by month for the 50%, 90%, and 99% hydrologic scenarios.

Near-Term Considerations

The January 1, 2015 50%, 90%, and 99% exceedance forecasts are included in Attachment 1. Each of these forecasts project monthly storage levels, reservoir releases, Delta pumping rates, and Delta outflow through the end of September 30, 2015. Much is still unknown about the hydrology for this year, and the hydrology will not follow these exact forecasts. For example, despite above normal rainfall in December in the Sacramento Basin, the hydrology has been dry since December 21, 2014. The following near-term actions are proposed as dry forecasts remain. The hydrology will likely continue to fluctuate between the scenarios making requests for modifications difficult to predict. Therefore, DWR and Reclamation will be seeking initial

modifications based on the current dry trend and the significant unknowns on the year's hydrology.

B. Near-Term Actions

Near-Term (1a): The minimum monthly Net Delta Outflow Index (NDOI) described in Figure 3 of D-1641 during the months of February and March could be requested to be modified to be no less than 4,000 cubic feet per second (cfs).

Near-Term (1b): The maximum Export Limits included in Table 3 of D-1641 could be requested to be modified as follows:

During February and March when footnote 10 of D-1641 is not being met, or the DCC gates are open during a period inconsistent with footnote 23 of D-1641, the combined maximum SWP and CVP export rate for SWP and CVP contractors at the Harvey O. Banks and C.W. "Bill" Jones pumping plants will be no greater than 1,500 cfs on a 3-day running average. When precipitation and runoff events occur that allow the DCC to be closed and footnote 10 of D-1641 is being met [3-day average Delta Outflow of 7,100 cfs or electrical conductivity of 2.64 milliohms per centimeter on a daily or 14-day running average at the confluence of the Sacramento and the San Joaquin rivers (Collinsville station C2) if applicable¹], but any additional Delta Outflow requirements contained in Table 4 of D-1641 are not being met, then exports of natural and abandoned flows are permitted up to D-1641 Export Limits contained in Table 3 and, in compliance with applicable laws and regulations including ESA and CESA.

Near-Term (2): The DCC Gate Closure requirements included in Table 3 could be requested to be modified as follows:

The DCC gates may be opened during February and March as necessary to preserve limited storage in upstream reservoirs and reduce intrusion of high salinity water into the Delta while reducing impacts on migrating Chinook salmon. Any requests for opening DCC gates will utilize the DCC Matrix and shall be determined through the Real-Time Drought Operations Management Team Process.

Near-Term (3): Table 3 San Joaquin River flow requirements at Airport Way Bridge, Vernalis, for February and March could be requested to be modified as follows:

Base flow period averages shall be no less than 500 cfs.

C. Detailed Description of Anticipated D-1641 Modification Requests

Differences in snowpack distribution, variation among basin and sub-basin hydrologic circumstances, disparity among month to month hydrologic conditions, and other meteorological uncertainties can also effect real-time reservoir and Delta operations and the available water supply at any given time. The 50%, 90% and 99% probability exceedence levels presented

¹ The Standard does not apply in May and June if the best available estimate of the Sacramento River Index for the water year is less than 8.1 MAF at the 90% exceedence level.

here, as used in this document, are very general and are not the only drivers of what modifications may be needed in the future. The purpose of this document is to set forth generally foreseeable modifications in a 50%, 90% and 99% exceedence scenario.

Consequently, it may be necessary to request modifications earlier than the timeframes outlined in this document, or before the broader hydrology has reached the next described exceedence level, or as additional modifications in response to unforeseen future conditions present themselves.

It is anticipated that all D-1641 Delta requirements would be met if hydrologic conditions in the Sacramento Basins are at the 50% exceedence level or wetter; conditions in the San Joaquin River Basin will likely require wetter conditions before D-1641 requirements related to the San Joaquin River can reliably be met. However, because of the uncertainty of actual hydrologic conditions for the remainder of the winter/early spring period, the Projects will, at a minimum, request the D-1641 modifications identified under the 50% Probability section prior to the end of January 2015. This will help meet the primary goals of the DCP in the event that hydrologic conditions remain drier than normal.

Additional TUCP requests identified under the 90% Probability and 99% Probability sections would likely follow in subsequent months if those respective scenarios play out over the course of water year 2015.

January 1, 2015 50% Probability

If conditions which produced above average conditions for the Sacramento River basin through the end of December 2014 were to continue through the remainder of the water year, Reclamation and DWR forecast that all D-1641 requirements related to that basin could be met without major adverse impacts to other beneficial uses.

However, because conditions in the San Joaquin River basin have been much drier and storages are severely depleted on that system, modifications to the Vernalis flow standard are likely to be requested even under median hydrologic conditions as follows:

50% (1): Table 3 San Joaquin River flow requirements at Airport Way Bridge, Vernalis, for April through June could be requested to be modified as follows:

Base flow period averages shall be no less than 710 cfs. The 31-day pulse flow period shall consist of an overall pulse flow volume equivalent to 31-days at a flow rate to be determined based on subsequent forecasts and operations of the other San Joaquin River tributaries. The start date and flow schedule for the overall pulse flow volume of water shall be determined through consultation with CDFW, NMFS and USFWS (fisheries agencies).

January 1, 2015 90% Probability

In addition to near-term provisions, some or all of the following additional provisions would likely be requested in March if a 90% scenario were to play out in either the Sacramento or San Joaquin River basins

90% (1a): The minimum NDOI described in Figure 3 of D-1641 during the months of April, May, and June could be requested to be no less than 7,100 cfs (or electrical conductivity of 2.64 millimhos per centimeter on a daily or 14-day running average at the confluence of the Sacramento and the San Joaquin rivers (Collinsville station C2)).

90% (1b): The maximum Export Limits during March in conjunction with revised NDOI requirement:

When precipitation and runoff events occur that allow footnote 10 of D-1641 to be met [3-day average Delta Outflow of 7,100 cfs or electrical conductivity of 2.64 millimhos per centimeter on a daily or 14-day running average at the confluence of the Sacramento and the San Joaquin rivers (Collinsville station C2)], but any additional Delta Outflow requirements contained in Table 4 of D-1641 are not being met, then exports of natural and abandoned flows are permitted up to D-1641 Export Limits contained in Table 3 and in compliance with applicable laws and regulations including ESA and CESA.

90% (2): Table 3 San Joaquin River flow requirements at Airport Way Bridge, Vernalis, for April through June could be requested to be modified as follows:

Base flow period averages shall be no less than 500 cfs. The 31-day pulse flow period shall consist of an overall pulse flow volume equivalent to 31-days at a flow rate to be determined based on subsequent forecasts and operations of the other San Joaquin River tributaries. The start date and flow schedule for the overall pulse flow volume of water shall be determined through consultation with CDFW, NMFS and USFWS (fisheries agencies).

90% (3): Table 2 Western Delta Sacramento River could be requested to be modified follows:
Move the compliance location from Emmaton on the Sacramento River to Threemile Slough on the Sacramento River.

90% (4): The Table 3 Sacramento River at Rio Vista flow requirements from September 30, 2015 could be requested to be modified as follows:

Flows shall be no less than 2,500 cfs on a monthly average. The 7-day running average shall not be less than 2,000 cfs.

January 1, 2015 99% Probability

In addition to near-term provisions, some or all of the following additional provisions would likely be requested in March if a 99% scenario were to play out in either the Sacramento or San Joaquin River basins:

99% (1a): The minimum monthly NDOI described in Figure 3 of D-1641 during the months of April, May, and June could be requested to be no less than 4,000 cfs.

99% (1b): The maximum Export Limits included in Table 3 of D-1641 could be requested to be modified as follows:

During April, May, and June when footnote 10 of D-1641 is not being met, or the DCC gates are open during a period inconsistent with footnote 23 of D-1641, the combined maximum SWP and CVP export rate for SWP and CVP contractors at the Harvey O. Banks and C.W. "Bill" Jones pumping plants will be no greater than 1,500 cfs on a 3-day running average. When precipitation and runoff events occur that allow the DCC to be closed and footnote 10 of D-1641 is being met [3-day average Delta Outflow of 7,100 cfs or electrical conductivity of 2.64 millimhos per centimeter on a daily or 14-day running average at the confluence of the Sacramento and the San Joaquin rivers (Collinsville station C2) if applicable], but any additional Delta Outflow requirements contained in Table 4 of D-1641 are not being met, then exports of natural and abandoned flows are permitted up to D-1641 Export Limits contained in Table 3 and, in compliance with applicable laws and regulations including ESA and CESA.

99% (2): The DCC Gate Closure requirements included in Table 3 could be requested to be modified as follows:

The DCC gates may be opened during April, May, and June as necessary to preserve limited storage in upstream reservoirs and reduce intrusion of high salinity water into the Delta while reducing impacts on migrating Chinook salmon. Requirements for closure of the DCC gates from February 15 through May 20 shall be determined through the Real-Time Drought Operations Management Process.

99% (3): Table 3 San Joaquin River flow requirements at Airport Way Bridge, Vernalis, for April through June could be requested to be modified as follows:

Both the base flow and pulse flow period averages will be determined based on subsequent forecasts and operations of the other San Joaquin River tributaries. The start date and flow schedule for any pulse flow volume of water shall be determined through consultation with the CDFW, NMFS and USFWS (fisheries agencies).

Emergency Drought Barriers

In addition to any TUCP provisions requested in the 99% scenario, at any time when the installation of Emergency Drought Barriers (EDB) is deemed to be necessary for human health and safety needs, the following modification provisions would likely be requested:

EDB (1): Table 2 Western Delta Sacramento River requirement at Emmaton would be requested to be suspended.

EDB (2): The minimum NDOI described in Figure 3 of D-1641 during the months of June, July, August, and September would be requested to be suspended.

EDB (3): The Table 3 Sacramento River at Rio Vista flow requirements for September would be requested to be suspended.

Installation of the EDB does not preclude DWR from fulfilling its North Delta Water Agency contractual obligations.

VI. Further Aspects of Potential Operations

A. Instream Flows

i. Trinity River

Spring flows on the Trinity River will be consistent with annual allocations as provided through the Trinity River Main-stem Fishery Restoration Record of Decision. Flows for the remainder of the year will make consistent with SWRCB order WR 90-5. Consistent with fish health criteria, releases to augment flows in the Lower Klamath River may be considered.

ii. Sacramento River

Flow releases at Keswick will be maintained at the minimum of 3,250 cfs this winter and spring as much as practicable to help conserve storage in Shasta Lake. Procedures consistent with the NMFS Biological Opinion will be applied through this period, and Reclamation will again work closely with the Sacramento River Settlement Contractors in scheduling their river diversions in a manner to help minimize the release of water prior to the start of the temperature management season. Likely starting in late May, flow releases will increase at Keswick to facilitate temperature management along the upper reach of the Sacramento River, and these increased flows will then be used to meet other Project purposes in the system.

iii. Clear Creek

Flows on Clear Creek will be consistent with the NMFS Biological Opinion and RPA actions. The timing of any prescribed pulse flows will be closely evaluated through technical teams to minimize effects on temperature management and/or ability to help meet other system flow needs.

iv. Feather River

Flows on the Feather River will be consistent with flow requirements on the Low Flow Channel and High Flow Channel on the Feather River and all temperature requirements at the Feather River Fish Hatchery and Robinson's Riffle for all periods as designated in the current FERC license which includes consultation by NMFS and USFWS, and the 1983 agreement between DWR and CDFW.

v. American River

Flows on the American River will be consistent with the provisions of the NMFS Biological Opinion and RPA actions. Flows in the winter and spring will generally follow the outline of the “American River Flow Management Standard”, with flows in the summer and into the fall intertwined with the temperature plan for Folsom Lake and the American River. Starting in June, flow releases will increase at Nimbus to facilitate temperature management along the American River, and these increased flows will then be used to meet other Project purposes in the system.

vi. Stanislaus River

Flows on the Stanislaus River will be consistent with the provisions of the NMFS Biological Opinion and RPA actions. Generally flows in the winter and spring will follow the “Appendix 2e” schedules (from the NMFS Opinion) as modified through the interagency Stanislaus Operations Group. Given the severely depleted storage at New Melones Lake, minimum flows will be maintained as much as possible. The requested modifications to objectives on the lower San Joaquin River at Vernalis are intended to conserve water in New Melones Lake to help balance the competing needs of the Stanislaus River and conditions on the lower San Joaquin River.

B. Additional Fishery Actions

The Agencies have described in detail other potential operations to maintain adequate protections for State and federally listed endangered and threatened species and other fish and wildlife resources in the event of continued dry hydrology in the 2015 Drought Strategy. These specific measures relate to potential flexibility in implementing Old and Middle River (OMR) flows, temperature management on the Sacramento River, LSNFH hatchery operations, DCC gate operations, and emergency drought barriers. (The 2015 Drought Strategy is included as Reference 1).

i. Initial Temperature Management Conditions – Sacramento River

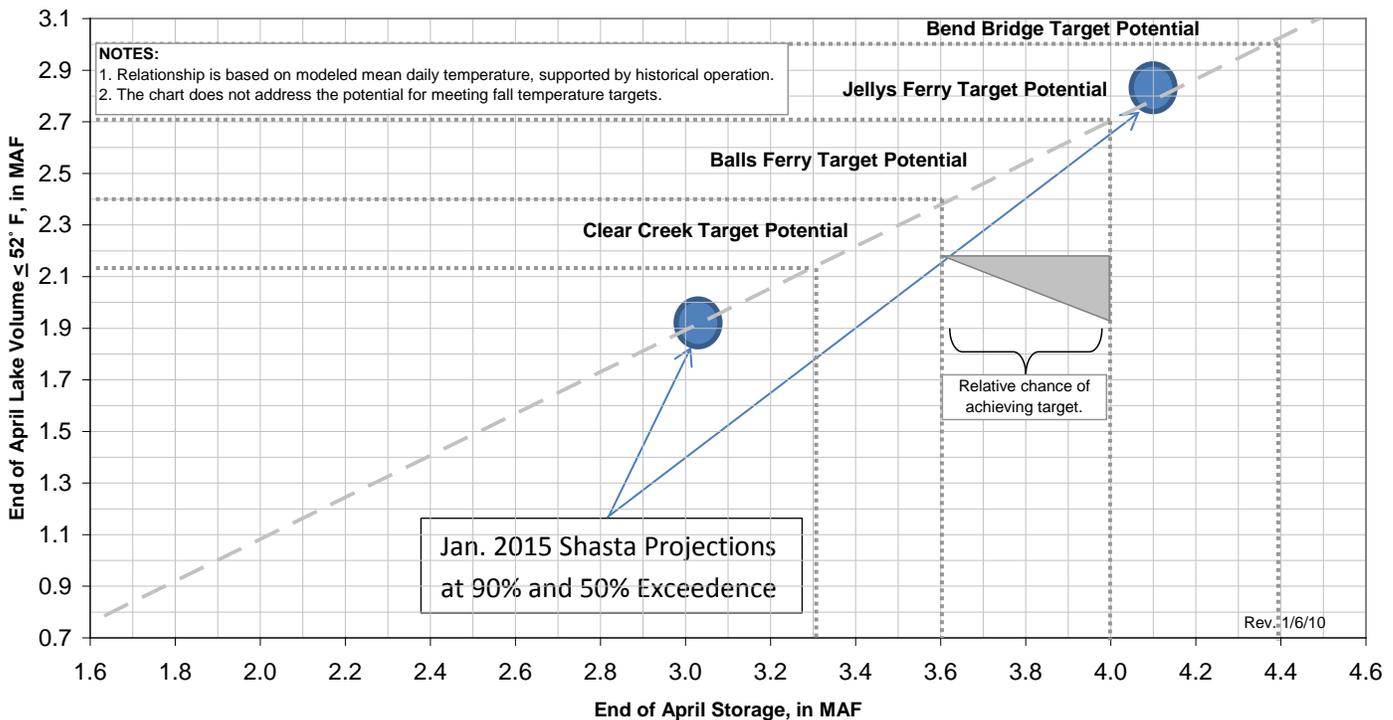
The current suite of runoff projections based on the January 1 forecasts (unadjusted based on observed conditions in January) suggests a significant range of possible temperature management outcomes for the Sacramento River. The range is more pronounced than some of the other aspects of this DCP given that the seasonal inflow to Shasta Lake is the prime driver of temperature performance on the Sacramento River, and the range of the potential inflow to Shasta Lake is sizable this early in the water year. Specifically, the January through April inflow projections currently range from 1.45 MAF in the 99% exceedence forecast, 2.00 MAF in the 90%, 3.05 MAF in the 50% exceedence forecast.

Another important consideration this year is that diversions from the Trinity River basin to the Sacramento River will be more limited than in past years given the relatively low storage projections at Trinity Lake and anticipated Trinity River operations this season.

Based on forecasted projections, the upper Sacramento River water temperature compliance locations could range from a location upstream of the Clear Creek confluence in a 90% exceedence scenario, to the Jelly's Ferry location in a 50% exceedence scenario.

Under the 99% hydrology temperature compliance will likely utilize the procedures outlined in the NMFS Winter-run Contingency Plan (Appendix-D of the April 2014 CVP and SWP Drought Operations Plan).

**Lake Shasta End of April Storage
Potential for Meeting Compliance Point Target of 56° F (Apr-Sep)**



Shasta Lake Projections
(based on exceedence forecasts including January)

Exceedence Forecast	April 30 Storage Projection (TAF)	April 30 Elevation Projection (ft)
90%	3,030	1,009
50%	4,140	1,053

For the 90% exceedence scenario, the maximum Shasta Lake elevation is projected to be only 1009 feet. This lake level would limit the flexibility of the Shasta Temperature Control Device (TCD) to only the Middle, Lower and Side gates to manage the coldwater pool. This is similar to

conditions of Water Year 2014. The Upper gates require a lake elevation of about 1,035 feet to be functional in managing water temperatures.

By contrast, in the 50% exceedence scenario, the operation of the Shasta TCD would utilize all the gate levels, and combined with the increase in available cold water, Reclamation could potentially attain the Jelly's Ferry compliance location this year.

ii. Hatchery Winter-run

In order to protect juvenile hatchery winter-run from exposure to the hydrodynamic effects from exports, Livingston Stone National Fish Hatchery managers will coordinate with DOSS to time the hatchery release of winter-run chinook with adequate hydrologic conditions, and track their movement down the Sacramento River into and through the Delta utilizing the acoustically-tagged winter-run released at approximately the same time. Real-time acoustic receivers will be deployed along the Sacramento River and Delta at various locations. DOSS will review the real-time acoustic tag data to determine the likely timing and distribution of the hatchery winter-run in the Sacramento River and into the Delta, and advise NMFS and Water Operations Management Team of potential risk of hatchery winter-run to the influences of the hydrodynamic effects of increased exports during sporadic storm events.

iii. Delta Cross Channel Gates

Based on current and projected water quality in the Delta, and at least 3 weeks prior to any need to open the DCC gates, Reclamation and DWR will determine whether adjustments in the timing of the opening of the DCC gates should occur in order to address the prospects of elevated salinities in the Delta (Action IV.1.2). The DCC gate triggers matrix will be used to determine risk to species and DCC gate operation in the event the DCC gates are opened to address water quality or supply concerns. The triggers outlined in this matrix provide direction for when the gates may remain open and a method that balances water supply and fishery objectives in the Delta.

iv. Emergency Drought Barriers

If winter forecasts show there will not be enough water in upstream reservoirs to repel the saltwater and meet health and safety and other critical needs, then installation of Emergency Drought Barriers will be considered to lessen water quality impacts. Excessive salinity increases in the Delta could render the water undrinkable by the 25 million Californians and unusable by the farms reliant upon this source. Temporary rock (rip-rap) Emergency Drought Barriers may be installed at up to three locations in the Delta during drought conditions in 2015 or in a subsequent year if necessary to manage salinity in the Delta when there is not enough water in upstream reservoirs to release to rivers to repel the saltwater. An interagency group is evaluating barrier installation – at this time, the following timeline is considered: The temporary rock barriers may be installed on or about May 7 in West False River and no sooner than May 22 at the Sutter Slough and Steamboat Slough. Construction would require approximately 30-60 days. Barrier removal would commence on or about October 1 and would require approximately 30-60 days for Sutter and Steamboat Sloughs and approximately 45-60 days for

West False River. The Agencies continue to work together to ensure compliance with appropriate State and federal laws.

In the event barriers are installed, barrier-associated biological and physical monitoring will be initiated in a timely fashion, in some cases in advance of barrier installation. Additionally, as described in Section V B, modifications to D-1641 standards would need to be requested.

VII. Real Time Monitoring Efforts to Inform Operations

A. Delta Smelt Early Warning Surveys

The current drought has highlighted the need to improve the array of information that is collected to support management decisions pertaining to the effect of winter/spring exports on the Delta Smelt population. Reclamation and USFWS coordinated for several months to develop early warning surveys to provide information on Delta Smelt distribution that will inform water operations in WY2015. The overall intent for early warning surveys is to inform USFWS and others whether, during weather events and freshets, substantial numbers of Delta Smelt are moving, or being moved, into areas potentially subject to entrainment. This information has helped to inform export operational decisions and allowed for flexibility in maximizing export opportunities early this year. The early warning surveys were initiated in December 2014 and will continue through April 2015. Reclamation, USFWS, CDFW and DWR are collaborating to leverage available funds from all agencies and integrate Delta Smelt and salmonid trawl efforts to improve efficiency.

Now that the storm systems in December have abated, per the study design weekly sampling is now occurring and will continue until weather or other circumstances indicate a need to return to daily sampling.

B. Salmonids Near-term Drought Monitoring

In WY2015, various salmonid monitoring efforts will continue, as long as drought conditions continue. Additional trawling and beach seining in the northern Delta, more frequent sampling at rotary screw traps further upstream in the Sacramento River Basin, and implementation of a DCC gate operations trigger matrix would accompany any modifications in operations of the DCC gates from those specified in the NMFS Biological Opinion or D-1641. Temperature and dissolved oxygen probes are planned to be deployed within redds of fall-run and winter-run salmon to monitor and allow for management of water quantity (minimizing the effects of dewatering) and water quality. An additional Kodiak trawl was conducted in December to monitor distributions of Delta Smelt and salmonids, and the early warning trawling planned for Jersey Point and Prisoner's Point will monitor salmonid species as well. This early warning trawling will provide information from additional locations in the Delta about the presence of salmonids, which will help to inform management decisions about OMR reverse flows. An increase in sampling duration at the salvage facilities was considered as part of the monitoring plan to minimize inaccuracies in expanded salvage counts and loss calculations. However,

after several discussions, DOSS advised NMFS not to increase the sampling duration because the disadvantages would outweigh the potential benefits.

Other studies on migration paths and mortality will continue in 2015 for winter-run and spring-run salmon, as well as steelhead and sturgeon, to improve scientific knowledge about the population dynamics of these species. An enhanced Particle Tracking Model that includes simulation of fish migration behavior will be tested in a pilot project to verify accuracy and the ability of the model to inform real-time management decisions. Using recent data, the upstream temperature model will also be recalibrated to improve its ability to forecast temperature conditions in the Sacramento River. A feasibility study on the use of passive integrated transponders to monitor the movement and fate of salmonids will also be conducted in 2015 to determine if this technology could be usefully deployed in California to improve knowledge of salmonid populations.

This monitoring in 2015 and beyond was developed to improve our understanding of timing and distribution of species in the Delta, as well as inform targeted research and fill data gaps that further detail risks resulting from water operations.

DROUGHT CONTINGENCY PLAN
(January 15, 2015 - September 30, 2015)

January 1 - 50% HYDROLOGIC EXCEEDENCE

END OF MONTH STORAGES (TAF)

RESERVOIRS	2015								
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Trinity	917	1019	1172	1287	1199	1080	958	867	783
Shasta	2188	2843	3498	3835	3898	3611	3195	2856	2733
Folsom	491	486	587	646	878	935	825	694	642
Oroville	1463	1933	2431	2742	2900	2910	2374	1883	1523
New Melones	583	635	684	675	655	597	502	397	322

MONTHLY AVERAGE RELEASES (CFS)

RESERVOIRS	2015								
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Trinity	300	300	300	550	4200	2100	1100	450	450
Sacramento	3250	3250	3250	5000	7000	10700	11050	9500	6200
American	900	5000	4700	4550	2100	2300	3400	3700	2250
Feather	950	950	800	1800	1050	1050	8600	8050	6950
Stanislaus	200	200	200	650	750	500	350	350	250

DELTA SUMMARY (CFS)

	2015								
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Rio Vista Flows	11150	27100	22300	13950	8200	6250	10600	10100	8850
Sac River at Freeport	13250	31750	26350	17250	11450	11700	19800	18950	16600
SJ River at Vernalis	1450	3150	3000	2650	3100	1400	1100	1050	950
Computed Outflow	13000	31900	27150	17950	11400	7500	6500	5450	4450
Combined Project Pumping	3550	5100	3300	1550	1600	2400	10500	11250	11200

January 1 - 90% HYDROLOGIC EXCEEDENCE

END OF MONTH STORAGES (TAF)

RESERVOIRS	2015								
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Trinity	888	926	1007	1075	967	862	761	658	599
Shasta	2036	2389	2751	2889	2815	2566	2261	1994	1875
Folsom	465	537	640	642	646	488	316	229	210
Oroville	1403	1641	1926	2067	2037	1874	1682	1523	1485
New Melones	543	544	537	492	411	333	255	180	123

MONTHLY AVERAGE RELEASES (CFS)

RESERVOIRS	2015								
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Trinity	300	300	300	550	2900	800	450	450	450
Sacramento	3250	3250	3250	4500	6400	8750	8500	7750	4900
American	900	1700	1900	3150	2500	4000	3800	2550	1350
Feather	950	950	800	1050	1300	1950	1400	1300	1200
Stanislaus	200	200	300	550	500	550	400	350	250

DELTA SUMMARY (CFS)

	2015								
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Rio Vista Flows	9450	12200	9800	7400	5800	5300	2650	2600	2600
Sac River at Freeport	11300	14550	12000	9700	8600	10450	8550	8350	7800
SJ River at Vernalis	1050	1400	1600	1450	1450	1050	900	750	750
Computed Outflow	9650	12750	12250	9250	7100	7100	4250	4350	4200
Combined Project Pumping	3550	4350	1800	1150	1150	1200	1250	1400	2300

Footnote: These forecast numbers include adjustments to January inflows based upon observed conditions through mid-January.

DROUGHT CONTINGENCY PLAN
(January 15, 2015 - September 30, 2015)

January 1 - 99% HYDROLOGIC EXCEEDENCE

END OF MONTH STORAGES (TAF)

RESERVOIRS	2015								
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Trinity	860	894	920	929	843	769	704	637	576
Shasta	1966	2173	2393	2424	2242	1843	1397	1070	936
Folsom	440	499	523	520	484	347	251	217	182
Oroville	1374	1516	1704	1762	1681	1468	1250	1027	1023
New Melones	543	544	537	491	409	331	254	178	122

MONTHLY AVERAGE RELEASES (CFS)

RESERVOIRS	2015								
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Trinity	300	300	300	600	1500	800	450	450	450
Sacramento	3250	3250	3250	4500	7000	10000	9850	7800	4900
American	900	800	1950	2000	1750	3050	2200	1200	1100
Feather	950	950	800	1650	1700	2700	2400	3100	950
Stanislaus	200	200	300	550	550	550	400	350	250

DELTA SUMMARY (CFS)

	2015								
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
Rio Vista Flows	7800	7550	7050	6100	5750	5850	2900	2600	2000
Sac River at Freeport	9350	9200	8800	8200	8550	11200	8950	8400	6950
SJ River at Vernalis	1050	850	850	1750	1550	300	250	350	350
Computed Outflow	7050	7100	8050	7800	7100	7100	4200	4300	4050
Combined Project Pumping	3550	3350	1300	900	850	900	900	900	900

Footnote: These forecast numbers include adjustments to January inflows based upon observed conditions through mid-January.

D-1641 Bay-Delta Standards

With Likely 2015 TUCP Requests

CRITERIA	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015	Aug 2015	Sep 2015
Jan 1 - 50% Hydrology								
• Outflow Spring X2 Minimum Outflow - mon.	Near-Term TUCP							
• River Flows @ Rio Vista - min. mon. avg. @ Vernalis: Base -min. mon. avg. Pulse objective	Near-Term TUCP		710 cfs	T.B.D.	710 cfs	710 cfs	710 cfs	
• Delta Cross Channel Gates	N-T TUCP							
• Salinity EC - Emmaton								

Jan 1 - 90% Hydrology									
• Outflow Spring X2 Minimum Outflow - mon.	Near-Term TUCP		7100 cfs	7100 cfs	7100 cfs				
• River Flows @ Rio Vista - min. mon. avg. @ Vernalis: Base -min. mon. avg. Pulse objective	Near-Term TUCP		500 cfs	T.B.D.	500 cfs			2500 cfs	
• Delta Cross Channel Gates	N-T TUCP								
• Salinity EC - Emmaton			Requirement Moved to Three Mile Slough						

Jan 1 - 99% Hydrology									
• Outflow Spring X2 Minimum Outflow - mon.	Near-Term TUCP		4000 cfs	4000 cfs	Suspended				
						Suspended			
• River Flows @ Rio Vista - min. mon. avg. @ Vernalis: Base -min. mon. avg. Pulse objective	Near-Term TUCP		T.B.D.	T.B.D.	T.B.D.			Suspended	
• Delta Cross Channel Gates	N-T TUCP		Conditional DCC Opening						
• Emergency Drought Barriers				Construction		Operational			
• Salinity EC - Emmaton			Suspended						

Interagency 2015 Drought Strategy
For the Central Valley Project and State Water Project
December 11, 2014
Working Draft

Overview

This Interagency 2015 Drought Strategy (2015 Drought Strategy) has been prepared by the Bureau of Reclamation (Reclamation), California Department of Water Resources (DWR), U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS) and California Department of Fish and Wildlife (CDFW). This 2015 Drought Strategy is comprised of three components which are outlined in this document: (1) a preliminary framework for the Drought Contingency Plan for Operations of the CVP and SWP (DCP), (2) the DCP Biological Monitoring Plan, and (3) Other Drought-Related Measures. The DCP, when finalized by the above agencies, will be submitted to the State Water Resources Control Board (SWRCB) on January 15, 2015, as required by the SWRCB's final Temporary Urgency Change Order dated October 7, 2014. The purpose of issuing this Drought Strategy is to inform stakeholders and the public of 2015 drought response actions being taken by the state and federal government relating to project water operations and related matters.

Introduction and Goals

As California approaches the winter after a third consecutive dry year, economic and environmental challenges for our State are mounting. Since December 2013, state and federal agencies that supply water, regulate water quality, and protect fish and wildlife have worked together to cope with persistent drought. Together, these agencies worked through existing statutory and regulatory obligations so that water operations could adjust quickly to changes in the weather and environment to support and improve water supply deliveries when possible while protecting water quality and fish and wildlife as required under state and federal laws and permits. The agencies recognize the importance of their efforts to minimize potential impacts from drought to food security, provide economic stability, and provide for species protection in California.

On January 17, 2014, the Governor issued a drought State of Emergency proclamation. On January 29, Reclamation and DWR sought a temporary modification to their water rights permits and licenses to allow appropriate modification of CVP and SWP operations to respond to the drought conditions. On January 31, 2014, the Executive Director of the State Water Resources Control Board (SWRCB) issued an Order that granted temporary modification to Water Rights Decision 1641 (D-1641). The modification allowed the Projects to reduce Delta outflow and thus

conserve upstream storage for later use. It also allowed the Projects to pump to meet critical supply needs when Delta outflow was lower than would typically allow such pumping

Consistent with the petition and subsequent acknowledgement in the Order, Reclamation and DWR convened a Real Time Drought Operations Management Team (RTDOMT) comprised of representatives from Reclamation, DWR, fisheries agencies, and the SWRCB to discuss more flexible operations of the Projects while protecting beneficial uses. Together, through subsequent petitions vetted through the RTDOMT and submitted to the SWRCB, Reclamation and DWR received modifications to the Order and adjustments to water operations under drought provisions of the smelt and salmon biological opinions. The RTDOMT developed a Drought Operations Plan (DOP) for April to November 2014 to address water operations which incorporated regulatory adjustments to balance water supply and biological benefits.

The modified Order, DOP, and subsequent biological reviews created flexibility for water operations which conserved water in upstream reservoirs for future beneficial uses. Some of the major modifications included shifting the Agricultural Western Delta Salinity Standard (EC) compliance from Emmaton upstream to Threemile Slough, adjusting Delta Outflow requirements, adapting OMR regulatory flows, and varying flow standards at Vernalis. These modifications allowed the projects to conserve a significant amount of water while operating under the Order and DOP.

As we approach 2015, Reclamation, DWR, FWS, NMFS and CDFW have prepared this 2015 Drought Strategy to be in a better position to address 2015 challenges and to inform stakeholders about the agencies' anticipated drought response efforts. The Strategy will help the five agencies to maximize operational flexibility of the CVP and the SWP to support water supplies while minimizing the adverse effects of the drought on water quality and imperiled species. This Strategy is currently intended to address drought responses through November 2015 through development and implementation of the individual key Strategy components and incorporates lessons learned from last year. The agencies recognize that effectively addressing a fourth year of drought will require extraordinary cooperation and action by water managers at the state, federal and local level to implement innovative water management measures. The agencies will support those efforts as appropriate to meet water needs in 2015.

The goals of this 2015 Drought Strategy are to operate the CVP and SWP and take other related actions consistent with the following core principles:

1. **Operate the CVP and SWP during the continuing drought to meet essential human health and safety needs and lessen critical economic losses throughout the CVP and SWP service areas from January 15 through November 15, 2015.** As a first priority, the Projects must assure that adequate water supplies are available for drinking water, sanitation, and fire suppression for communities within their service areas. Beyond

providing for these basic needs, this 2015 Drought Strategy provides for operation of the CVP and SWP systems to lessen critical economic losses due to water shortages through project water deliveries and by facilitating voluntary water transfers and exchanges to the extent possible, while balancing the other purposes of the Strategy described below.

2. **Control of salt water intrusion in the Sacramento-San Joaquin Delta (Delta).** Salt water pushes inland from San Francisco Bay, driven in large part by tidal rise and fall of the ocean, and reaching inland to the point where fresh water inflows to the Delta present a barrier that keeps the salinity from proceeding further. The fresh water inflows to the Delta are primarily determined by managed releases from upstream reservoirs. If there is not enough water in upstream reservoirs to release to rivers to repel the saltwater, the salinity intrusion impairs water quality in the channels from which water supplies are drawn, not just for the SWP and CVP but also for Delta farmers and water districts in nearby Contra Costa, Alameda and San Joaquin counties. Maintenance of sufficient reservoir storage is critical to control Delta salinity in the upcoming (2015) spring through the fall months; therefore, this 2015 Drought Strategy balances the often conflicting needs of protecting upstream storage, providing critically needed water deliveries from the Delta in the spring and summer, and maintaining salinity control in the Delta for diversions and deliveries later in the year and possibly into 2016. If winter forecasts show there will not be enough water in upstream reservoirs to repel the saltwater and to meet health and safety and other critical needs, then installation of Emergency Drought Barriers will be considered to lessen water quality impacts.
3. **Preserve cold water pools in upstream reservoirs for temperature management to maintain cool water temperatures for salmon and steelhead.** These same water supplies also serve other beneficial uses including water deliveries and Delta salinity management in water year (WY) 2015 and in WY 2016 if dry conditions continue.
4. **Maintain adequate protections for state and federally endangered and threatened species and other fish and wildlife resources.** Operational criteria will be implemented this year in a manner that provides adequate fishery protections. This 2015 Drought Strategy identifies the criteria that have been or could be modified in order to balance all needs while continuing to provide the protections required by law. The key components that will be used to implement the strategy will be reviewed under applicable laws, including the federal Endangered Species Act (ESA), California ESA and the California Water Code.
5. **Provide an overview of biological monitoring that may be implemented to assist in development of forecasted operations as well as guide daily operations to increase the agencies' ability to support and improve water deliveries while also meeting**

water quality and species requirements. The goal of the monitoring is to provide data that can be assessed so that biological needs and water supply objectives are considered in real time (*i.e.*, on a weekly or daily basis). Monitoring provides important information to decision makers when considering the potential effects of real-time operations. Monitoring allows for decisions to be made using relevant information such as species presence and risk level.

6. **Highlight other drought-related measures that the federal and state agencies will pursue in 2015.** These actions, if implemented, may be helpful under certain conditions in alleviating some impacts to water supply caused by the drought. These measures may also have additional utility beyond the drought.

Key Components

Key components associated with the 2015 Drought Strategy for the CVP and SWP include the following:

- Drought Contingency Plan for Operations
- Biological Monitoring Plan
- Other 2015 Drought-Related Measures

1. Drought Contingency Plan (DCP) for Operations of the CVP and SWP

Reclamation and DWR are working collaboratively with the FWS, NMFS, CDFW and the SWRCB to prepare a 2015 DCP for operations of the CVP/SWP (also “Projects”) in the event that water supplies remain very low. The 2015 Interagency Drought Strategy will be used by DWR and Reclamation to inform the Drought Contingency Plan to be completed per the SWRCB final Temporary Urgency Change Order dated October 7, 2014. The SWRCB’s October 7, 2014, Order required the agencies to develop a two-phased DCP. Phase 1 was submitted to the SWRCB on October 15 (*see Enclosure I*) and addresses operation of the CVP and SWP from *October 15, 2014, through January 15, 2015*. Phase 2 is due to the SWRCB by January 15, 2015, and will include forecasted conditions related to the operation of the CVP and SWP from *January 15, 2015, through September 30, 2015*. The DCPs will be modified as needed in the future based on evolving circumstances, including additional direction from the SWRCB as well as current hydrologic and biological conditions. The agencies will use the outline below to develop the Phase 2 DCP ordered by the SWRCB. However, it may be difficult to include some of the actions outlined below in the monthly hydrology forecasts requested by the SWRCB.

Phase 2 of the 2015 DCP will address a range of potential hydrologic/runoff conditions through forecasted operation of the CVP and SWP to (not in order of priority):

- Meet essential human health and safety needs and, where possible, lessen critical economic losses
- Manage salinity intrusion in the Sacramento-San Joaquin Delta
- Manage cold water in Project reservoirs for various cold water species
- Maintain protections for listed species and other fish and wildlife resources to the extent possible given the severity of the drought
- Provide SWP and CVP contractual deliveries based on forecasts and available water supplies. The SWP initial water supply allocation is made December 1. The CVP initial allocation is released in February. Updated forecasting occurs monthly thereafter.

Anticipated Collaboration Process

Reclamation and DWR have recommenced the RTDOMT meetings that were established in 2014 (see Introduction). Reclamation, DWR, CDFW, FWS, NMFS, and the SWRCB will meet at least once a week in order to review real-time water operation and biological information to assess potential drought response actions. The RTDOMT provides state and federal water operators, fish agencies, and the SWRCB with a reliable communication schedule and established points of contact to timely respond to emerging issues.

Biological information will be collected through standard survey programs and via additional monitoring, including Early Warning Surveys (*see section 2 and Enclosure II for the DCP Biological Monitoring Plan*). The available physical and biological data will be evaluated on an ongoing basis by the RTDOMT agencies to ensure efficient water operations management through potentially dynamic weather and flow events. As circumstances permit, the Projects may request adjustments in OMR flow management through the RTDOMT process. In considering such requests, the RTDOMT will convene and evaluate real-time and forecasted hydrology, data from various monitoring and sampling locations, and any recommendations from the Delta Operations for Salmonids and Sturgeon (DOSS) or Smelt Working Group (SWG). If temporary adjustments to the Biological Opinions or D-1641 are requested by the Projects, they will submit a written request to the appropriate agencies for consultation or approval.

The RTDOMT will also monitor water transfers and address operational issues associated with making transfers in light of drought operations.

Summary of anticipated contents of the Phase 2 of the DCP:

- I. Introduction and Purposes of the Plan*
- II. 2015 Water Conditions and Forecasted Operations of the CVP and SWP for January 15-November 15, 2015*
- III. Critical CVP/SWP Operational Considerations*

- A. Essential Human Health and Safety
- B. Storage Conditions going into 2016 will be assessed in early January 2015 and included in the January 15 report to the SWRCB.
- C. Maintaining Salinity Control through Emergency Drought Barriers
 - i. Excessive salinity increases in the Delta could render the water undrinkable by 25 million Californians and unusable by farms reliant upon this source. Temporary rock (rip-rap) barriers may be installed at up to three locations in the Delta during drought conditions in 2015 or in a subsequent year if necessary to manage salinity in the Delta when there is not enough water in upstream reservoirs to release to rivers to repel the saltwater.
 - ii. An interagency group is considering installing barriers – at this time, the following timeline is considered: The temporary rock barriers may be installed on or about May 7 in West False River and no sooner than May 22 at the Sutter Slough and Steamboat Slough. Construction would require approximately 30-60 days. Barrier removal would commence on or about October 1 and would require approximately 30-60 days for Sutter and Steamboat Sloughs and approximately 45-60 days for West False River.
- D. Coldwater management and other fishery needs: The end-of-September 2014 storage of approximately 1.163 million acre-feet in Shasta Reservoir is very low and may not be adequate to maintain winter-run Chinook salmon egg incubation and fry production throughout the 2015 broodyear (through September 2015) in the Sacramento River without a marked increase in inflow into Shasta Lake. The April 8, 2014, *Central Valley Project and State Water Project Drought Operations Plan and Operational Forecast April 8, 2014 through November 15, 2014* (DOP) included a winter-run contingency plan (Attachment D), which provided for an enhanced monitoring program, various infrastructure improvements and decision points based on various considerations in order to minimize the negative effects of the drought and operations in 2014. A similar winter-run contingency plan will be needed for 2015.
- E. CVP and SWP Water Supplies for WY 2015: Reclamation and DWR will follow their normal processes for making allocations of supplies for 2015. Water contractors will be involved regularly in discussions regarding 2015 CVP/SWP operations and contract allocations.
- F. Refuge Water Supply: Central Valley Project Improvement Act (CVPIA) refuge water supplies will follow their normal process in making allocations. CVPIA refuge managers will be involved regularly in discussions regarding 2015 CVP/SWP operations and contract allocations.
- G. Operational Flexibility to support potential exchanges and transfers: The agencies will support efforts to implement extraordinary one-year transfers or multi-year exchange agreements between water users.

H. Water re-use and conservation: The agencies intend to pursue water re-use and promote conservation efforts where appropriate to make the most use of limited supplies.

IV. *Overview of 2015 Forecasts and Operations*

A. Overview

B. Process: The five agencies will continue coordinating with the SWRCB through the existing RTDOMT.

C. CVP and SWP Forecasts

V. *Proposed Upstream Tributary Operations (Temperatures and flows) – January 15- November 15, 2015- this section is under development; following is the current outline for the plan*

A. Upper Sacramento River, Trinity River, and Clear Creek Flows and Temperature Management Planning – NMFS Reasonable and Prudent Alternative (RPA) Action 1.2.3.C

i. Trinity Operations

ii. Clear Creek Operations

iii. Shasta Operations/Keswick Release Schedule

iv. These operations will be developed further and refinements will be incorporated based on operation from last year.

B. Folsom/American River Operations

C. New Melones/Stanislaus River Operations

D. Oroville/Feather River Operations

VI. *Proposed Delta Operations – Winter*

A. 2009 Biological Opinion and Conference Opinion on the Long-term Operations of the Central Valley Project and the State Water Project (NMFS BiOp) Provisions

i. Delta Cross Channel (DCC) Operation–Based on current and projected water quality in the Delta, and at least 3 weeks prior to any need to open the DCC gates, Reclamation and DWR will determine whether adjustments in the timing of the opening of the DCC gates should occur in order to address the prospects of elevated salinities in the Delta (Action IV.1.2). The DCC gate triggers matrix (as described in Appendix G of the DOP) will be used to determine operation the DCC gates. The triggers outlined in this matrix provide direction and a method that balances water quality and fishery objectives in the Delta. There is a reasonable potential that water quality will be adversely affected by a continuation of the drought into early water year (WY) 2015; therefore the January 15 DCP is expected to propose modifications to water quality criteria to achieve the aforementioned balance.

- ii. The interagency group continues to discuss short-term flexibilities to allow OMR exceedances of the 14-day running average during sporadic storm events under an exceptionally dry hydrology: Upon the onset of RPA Action IV.2.3 for OMR flow management, OMR shall be no more negative than -5,000 cfs as a 14-day running average, and no more negative than -6,250 cfs as a 5-day running average, except as needed to capture sporadic storms (increase exports). This exception would be evaluated based on listed species distribution and risk in the South and Central Delta, and if conditions remain very dry (according to subsections below).
1. While Action IV.2.3 is in effect, and drought conditions remain, the Projects may request an adjustment to its implementation by requesting that the use of the OMR Index criteria (as approved by USFWS, NMFS, and CDFW) to be no more negative than -6,000 cfs for limited periods in order to capture additional natural or abandoned flow in the Delta because of infrequent storm events. Through this operational flexibility, the Projects are expected to be able to increase exports over what they would otherwise be able to do, while providing protections for the listed species. During any potential adjustment to Action IV.2.3, the action triggers provided in RPA Action IV.2.3 (*e.g.*, combined older juvenile Chinook salmon loss density) will continue to be in effect. Additional flexibility, use of the OMR Index to be no more negative than -6,500 cfs for short periods, may be requested by the Projects to capture the peak of storm events. Once the operational flexibility has been exercised, operations will conform OMR flows consistent with RPA Action IV.2.3.
 2. On occasion, there may be multiple rainfall events that occur one right after the other that make implementation of subsection 3, below, difficult, especially in consideration of the Projects exporting as much natural and abandoned flow as possible. In these situations, Reclamation and DWR may request additional flexibility in OMR flow management through the RTDOMT. In considering the request, the RTDOMT will convene and evaluate real-time and forecasted hydrology, data from various monitoring locations (*e.g.*, Knights Landing RSTs, Sacramento trawl and beach seines, Jersey Point and Prisoners Point trawls, and the Federal and state fish facilities), and any advice from the DOSS, in making a decision whether to grant the additional flexibility, and for what duration.
 3. A similar flexibility was granted and implemented during a few storms in water year 2014. However, increases in combined exports lagged behind (a couple-day lag time) the peak of the increased natural flow in the Delta. If flexibility is requested and subsequently granted, increased exports during sporadic storm events in water year 2015 will

be implemented during the ascending limb of the hydrograph, followed by a subsequent reduction in exports during the descending limb of the storm events. The key to this operation is to capture the spike in water availability prior to a coincident spike in listed fish presence in the central and south Delta. This request will be accompanied by augmented real-time monitoring at Prisoners Point and Jersey Point in order to evaluate the timing, location and magnitude of listed anadromous salmonid species in the Delta.

4. Hatchery winter-run and their exposure to the hydrodynamic effects from exports: Livingston Stone National Fish Hatchery (LSNFH) managers will coordinate with DOSS to time the hatchery release of winter-run chinook to good hydrologic conditions, and track their movement down the Sacramento River into and through the Delta utilizing the acoustically-tagged winter-run released at approximately the same time. Real-time acoustic receivers will be deployed along the Sacramento River and Delta at various locations. DOSS will review the real-time acoustic tag data to determine the likely timing and distribution of the hatchery winter-run in the Sacramento River and into the Delta, and advise NMFS and Water Operations Management Team (WOMT) of potential risk of hatchery winter-run to the influences of the hydrodynamic effects of increased exports during the sporadic storm events. Beginning in March 2015, enhanced Particle Tracking Model (PTM) modeling will also be utilized to inform real time OMR limits and in consideration of any requests for flexibility in OMR flow management.

- iii. Fish migration non-physical barriers (*e.g.*, Georgiana Slough, Delta Cross Channel)
- iv. Preferential export shift to Jones Pumping Plant: One option to help reduce increased impacts on migrating fisheries due to these adjustments in operations may be to shift facility operations so that minimal export pumping will occur at the SWP's Banks Pumping Plant and the majority will occur at the CVP's Jones Pumping Plant. This export shift typically increases survival of salmonids through these facilities since fewer fish will enter the SWP where losses are higher due to substantial pre-screen mortality associated with Clifton Court Forebay. Combined exports would remain the same. The amount of shifted pumping from Banks to Jones would be made available to the SWP.

B. 2008 Biological Opinion for Delta Smelt (FWS BiOp) Provisions

- i. December-January OMR management. OMR management for Delta Smelt is best divided into two time periods to distinguish the early months (December

and first half of January) when a “first flush” migration can occur from later months when the fish are less likely to strongly respond to freshets.

- ii. December 1 through January 15. Delta Smelt may migrate into fresher water in response to physical environmental stimuli, including turbid freshets passing through the Delta, during December and early January. These freshets usually originate in the Sacramento River drainage. As such, Delta Smelt residing in or near the Low Salinity Zone usually move into the Sacramento River side of the Delta in response to early freshets. The current understanding is that they do not enter the San Joaquin River side of the Delta unless the freshet originated in the San Joaquin drainage or there is high negative OMR flow during the freshet that carries a strong plume of turbid Sacramento River water into the Central and South Delta. During December and January, but not other months, there is a significant potential for large numbers of Delta Smelt to be drawn into the Central and South Delta and become entrained at the pumps if high negative OMR flow is maintained while turbid freshets are passing through the Delta. Moreover, fish drawn into the Central and South Delta during such events are likely to remain in those areas and may spawn, potentially creating a management challenge that can persist for an extended period. Hence, there is considerable value in planning early freshet operations that optimize water exports while avoiding potentially lingering Delta Smelt entrainment concerns.
- iii. January 15 through March. The proposed approach for Delta Smelt in the early winter is focused on avoiding drawing Delta Smelt into areas where adult Delta Smelt and their progeny would be at risk of entrainment. If successful, that approach should minimize the need to take actions for Delta Smelt later in the winter that are more restrictive than those needed to protect salmon. In the event storms are infrequent, the RTDOMT expects to implement short-term flexibilities when they occur to allow OMR exceedances in situations where such exceedances may allow for increased water exports while avoiding excessive take of Delta Smelt. Any such request will be accompanied by augmented real-time monitoring at Prisoners Point and Jersey Point in order to evaluate in real-time any changes in the distribution or density of Delta Smelt in the Central Delta. In accordance with the approach employed in last year’s drought operations, such a request will also be accompanied by an analysis of effects of the proposed operations on Delta Smelt distribution and entrainment risk. The analyses will address monthly and real-time Delta Smelt distributional information and trends,

physical environmental conditions, and, if appropriate, hydrodynamic model output.

Management decision-making during both period (1) and period (2) of the winter will be aided by review of information obtained through “early warning” trawl sampling for Delta smelt that began on December 1. Early-warning drought monitoring will include a survey of the Spring Kodiak Trawl program in December, where the program formerly began in January, and a “real-time” component that samples as frequently as on alternate days in the Central Delta. The “real-time” component has a high potential to quickly answer whether Delta smelt are in danger of moving so far into the Central and South Delta that strong entrainment concerns will eventuate. The information from the “early warning” sampling will be very carefully evaluated along with other sources of information bearing on operations management.

The combination of turbidity modeling and augmented biological monitoring is expected to allow more focused management of OMR flow. Where in the past agencies were forced to rely on a combination of monthly biological monitoring and real-time turbidity and flow monitoring, it may now be possible to incorporate real-time monitoring in all three of these areas into management decision-making. As such, FWS expects to be able to more narrowly focus reductions in exports during early storm events than would have been possible in the past, while still maintaining adequate entrainment protection for Delta smelt that may be in the lower Sacramento and San Joaquin rivers.

C. D-1641 Provisions

- i. Triggers for DCC gate operation to balance water quality and fish
- ii. Modify D-1641 Export to Inflow (E/I) ratio’s averaging period for sporadic storm events (similar to last year)
- iii. Triggers for modified X2 criteria to balance upstream storage and fish protection
- iv. Modify Vernalis-based flows if drought persists

D. Consistency with CESA for SWP

- i. CDFW will work in coordination with FWS and NMFS through the RTDOMT to review requests by DWR for operational adjustments to implement the actions described above pursuant to the California Endangered Species Act (CESA) and the existing consistency determinations on the BiOps

for the SWP, to ensure ongoing CESA compliance in light of flexibility provided in the RPAs and the range of effects analyzed.

- ii. Compliance with Longfin Smelt Incidental Take Permit (ITP) – CDFW will work through the RTDOMT and in consultation with the Smelt Working Group (SWG) to monitor the risk to Longfin Smelt and review proposed changes in operations to ensure compliance with the Longfin Smelt ITP for the SWP. The proposed approach for Longfin Smelt in the early winter is focused on avoiding drawing Longfin Smelt into areas where adult Longfin Smelt and their progeny would be at risk of entrainment. If successful, that approach should minimize the need to take actions for Longfin Smelt during the winter that are more restrictive than those needed to protect salmon. The RTDOMT will continue to consider short-term flexibilities to allow OMR exceedances in situations where such exceedances may allow for increased water exports while avoiding excessive take of Longfin Smelt. Any such request will be accompanied by analysis of the effects of the proposed operations on to Longfin Smelt based on the distribution and entrainment risk of Longfin Smelt in the Central and South Delta. The analyses will address monthly and real-time Longfin Smelt distributional information and trends, physical environmental conditions, and, if appropriate, hydrodynamic model output.

VII. *Proposed Delta Operations – Spring*

A. NMFS BiOp Provisions

- i. Short-term flexibilities to allow OMR exceedances of the 14-day running average during sporadic storm events under an exceptionally dry hydrology: Upon the onset of RPA Action IV.2.3 for OMR flow management, OMR shall be no more negative than -5,000 cfs as a 14-day running average, and no more negative than -6,250 cfs as a 5-day running average, except as needed to capture sporadic storms (increase exports). This exception would be evaluated based on listed species distribution and risk in the South and Central Delta, and if conditions remain very dry (according to subsections below).
 - 1. While Action IV.2.3 is in effect, and drought conditions remain, the Projects may request an adjustment to its implementation by requesting that the use of the OMR Index criteria (as approved by USFWS, NMFS, and CDFW) to be no more negative than -6,000 cfs for limited periods in order to capture additional natural or abandoned flow in the Delta because of infrequent storm events. Through this operational flexibility, the Projects are expected to be

able to increase exports over what they would otherwise be able to do, while providing protections for the listed species. During any potential adjustment to Action IV.2.3, the action triggers provided in RPA Action IV.2.3 (e.g., combined older juvenile Chinook salmon loss density) will continue to be in effect. Additional flexibility, use of the OMR Index to be no more negative than -6,500 cfs for short periods, may be requested by the Projects to capture the peak of storm events. Once the operational flexibility has been exercised, operations will conform OMR flows consistent with RPA Action IV.2.3. Through this operational flexibility, the Projects are expected to be able to increase exports over what they would otherwise be able to do, while providing protections for the listed species. During any potential adjustment to Action IV.2.3, the action triggers provided in RPA Action IV.2.3 (e.g., combined older juvenile Chinook salmon loss density) will continue to be in effect. Additional flexibility may be requested by the Projects to address changing hydrologic and species distribution conditions throughout the water year.

2. On occasion, there may be multiple rainfall events that occur one right after the other that make implementation of subsection B, below, difficult, especially in consideration of the desire for the Projects to export as much natural and abandoned flow as possible. In those situations, Reclamation and DWR may request additional flexibility in OMR flow management through the RTDOMT. In considering the request, the RTDOMT will convene and evaluate real-time and forecasted hydrology, data from various monitoring locations (e.g., Knights Landing RSTs, Sacramento trawl and beach seines, Jersey Point and Prisoners Point trawls, and the Federal and state fish facilities), and any advice from the DOSS, in making a decision whether to grant the additional flexibility, and for what duration.
3. A similar flexibility was granted and implemented during a few storms in water year 2014. However, increases in combined exports lagged behind (a couple-day lag time) the peak of the increased natural flow in the Delta. If flexibility is requested and subsequently granted, increased exports during sporadic storm events in water year 2015 will be implemented during the ascending limb of the hydrograph, followed by a subsequent

reduction in exports during the descending limb of the storm events. The key to this operation is to capture the spike in water availability prior to a coincident spike in listed fish presence in the central and south Delta. This request will be accompanied by augmented real-time monitoring at Prisoners Point and Jersey Point in order to evaluate the timing, location and magnitude of listed anadromous salmonid species in the Delta.

- ii. Flexibility with San Joaquin I/E ratio. Currently, the agencies are discussing several concepts for providing additional flexibility in the April-May period, in the event that conditions remain very dry. These operations will be discussed further and evaluated as part of the phased operations plan as hydrology is updated. These concepts include the following:
 - a. Consider different functional forms of the relationship between Vernalis flow and exports in the implementation of the San Joaquin I/E ratio, such that if there is a dry year classification, the ratio is less than 2:1 (closer to 1:1).
 - b. If critically dry, consider added flexibility in the 1:1 ratio on the shoulders of Vernalis pulse flows to capture sporadic storm events (similar to last year).
 - c. Clarify the treatment of potential transfers during this period.
 - d. Declare San Joaquin River water year classification (dry or critically dry year classification) as early as possible (see Reclamation's February 7, 2014, letter to NMFS for example).
- iii. The spring head of Old River barrier (HORB) will be installed and operational by April 1 if hydrological conditions are compatible. The HORB is installed in the spring and is intended to prevent downstream-migrating salmonids in the San Joaquin River from entering Old River. Flow conditions will be assessed to determine actual date of installation.
- iv. Preferential export shift to Jones Pumping Plant: An element to reduce potentially greater exports during April and May 2015 than would occur under an unmodified RPA Action IV.2.1 could be a facility shift in exports so that minimal pumping will occur at the SWP's Banks Pumping Plant and the majority will occur at the CVP's Jones Pumping Plant. This export shift will increase survival of salmonids through these facilities, since fewer fish will enter the SWP, where loss is higher due to substantial pre-screen mortality associated with Clifton Court Forebay. Combined exports would remain the

same. The amount of shifted pumping from Banks to Jones would be made available to the SWP.

B. FWS BiOp Provisions

- i. The proposed approach for Delta Smelt in the early winter is focused on avoiding drawing Delta Smelt into areas where adult Delta Smelt and their progeny would be at risk of entrainment. If successful, that approach should minimize the need to take actions for Delta Smelt in the spring that are more restrictive than those needed to protect salmon. In the event storms are infrequent, the RTDOMT expects to implement short-term flexibilities when they occur to allow OMR exceedances in situations where such exceedances may allow for increased water exports while avoiding excessive take of Delta Smelt. Any such request will be accompanied by augmented real-time monitoring at Prisoners Point and Jersey Point in order to evaluate in real-time any changes in the distribution or density of Delta Smelt in the Central Delta. In accordance with the approach employed in last year's drought operations, such a request will also be accompanied by an analysis of effects of the proposed operations on Delta Smelt distribution and entrainment risk. The analyses will address monthly and real-time Delta Smelt distributional information and trends, physical environmental conditions, and, if appropriate, hydrodynamic model output.

C. D-1641 Provisions

- i. Implement D-1641 E/I ratio's averaging period for sporadic storm events (similar to last year).
- ii. Triggers for modified X2 criteria to balance upstream storage and fish protection.
- iii. Triggers for moving Western Delta Ag compliance point (i.e.:Emmaton to Three-Mile Slough).
- iv. Modify San Joaquin-based flows at Vernalis if drought persists.

D. Consistency with CESA for SWP

- i. CDFW will work in coordination with FWS and NMFS through the RTDOMT to ensure that requests by DWR for operational adjustments to implement the actions described above pursuant to the CESA and the existing consistency determinations on the BiOps for the SWP, to ensure ongoing CESA compliance in light of flexibility in the RPAs and the range of effects analyzed.
- ii. Compliance with Longfin Smelt ITP – CDFW will work through the RTDOMT and in consultation with the SWP to monitor the risk to Longfin

Smelt and review proposed changes in operations to ensure compliance with the Longfin Smelt ITP for the SWP. The proposed approach for Longfin Smelt in the spring is focused on minimizing entrainment of Longfin Smelt juveniles. If successful, that approach should minimize the need to take actions for Longfin Smelt during the spring that are more restrictive than those needed to protect salmon. The RTDOMT will continue to consider short-term flexibilities to allow OMR exceedances in situations where such exceedances may allow for increased water exports while avoiding excessive take of Longfin Smelt. Any such request will be accompanied by analysis of the effects of the proposed operations on to Longfin Smelt based on the distribution and entrainment risk of Longfin Smelt in the Central and South Delta. The analyses will address monthly and real-time Longfin Smelt distributional information and trends, physical environmental conditions, and, if appropriate, hydrodynamic model output.

- E. Maintaining Salinity Control through Possible Emergency Drought Barriers: Reclamation and DWR's planning assumptions for 2015 include the possibility of installing temporary rock barriers across three Delta waterways to mitigate water quality impacts when there is not enough water in upstream reservoirs to meet other beneficial uses and repel the saltwater. The three barriers would be constructed at Sutter Slough, Steamboat Slough and West False River. Releases from Shasta, Folsom, Oroville and other reservoirs to provide sufficient Delta outflow to repel saltwater and protect Delta water quality could be reduced with the temporary barriers in place. If the barriers are determined to be necessary, DWR would complete installation within 30-60 days, delaying construction as long as possible to minimize effects on fish. In the event barriers are installed, barrier-associated biological and physical monitoring will be initiated in a timely fashion, in some cases in advance of barrier installation. Additionally, adjustments to D-1641 will need to occur.
- F. Allow transfers outside the July through September window provided for in the Biological Opinions if conditions permit.

VIII. Proposed Delta Operations – Summer and Fall

- A. Maintaining Salinity Control through Possible Emergency Drought Barriers: Use of the temporary rock barriers, if applicable, would continue throughout the summer. If temporary rock barriers are constructed, removal would commence on or near October 1. For Sutter Slough and Steamboat Slough, removal must start no later than October 15, and complete barrier removal must occur by November 1. For a barrier at West False, complete removal must occur by November 15.
- B. NMFS BiOp Provisions

C. FWS BiOp Provisions

- i. Fall X2 Action (if Sacramento Valley classification is above normal or wet). This RPA component is not expected to be triggered in WY 2015; however, during the year, Reclamation will work with DWR, NMFS, FWS, CDFW and others to refine the Fall Outflow AMP based on findings to date, including, if appropriate, proposing new experimental management strategies based on those findings.

D. D-1641 Provisions

- i. Rio Vista Flow
- ii. Net Delta Outflow
- iii. October San Joaquin base flow at Vernalis

E. CDFW Consistency Determination and CESA ITP Provisions

F. Fall head of Old River barrier

- i. Fall HORB installation. The fall HORB barrier is similar in design to the spring barrier, but smaller in size. The fall barrier is intended to benefit migrating adult salmon in the San Joaquin River by improving flow and dissolved oxygen conditions in the river downstream of the barrier. The fall HORB is typically installed upon request by CDFW.

G. Allow transfers outside the July through September window provided for in the Biological Opinions if conditions permit.

- IX. *Measures to Minimize Effects of Drought Operations to Species*- Agencies are exploring potential measures to minimize effects of drought operations to species. Current ideas include less negative OMRs following peak storm events, enhanced protection of hatchery winter run Chinook release through real-time operations informed by monitoring, providing for additional flows in the San Joaquin River, shifting exports to Jones Pumping Plant (CVP), and construction of non-physical barriers at Georgiana Slough and/or the DCC.

2. DCP Biological Monitoring Plan

Reclamation, DWR, FWS, CDFW and NMFS have been working on a DCP Biological Monitoring Plan focused on smelt and salmonids for 2015 and beyond (*See Enclosure II*). The goals of this initiative is to provide additional data on the location and movement of Delta Smelt and salmonids that will increase the agencies' ability to manage water operations in a manner that protects the imperiled fish while supporting and improving water deliveries.

Delta Smelt Early Warning Surveys

Reclamation and FWS have been coordinating for several months to develop early warning surveys to provide information on Delta smelt distribution that will inform water operations in WY2015. The current drought has highlighted the need to improve the array of information that is collected to support management decisions pertaining to the effect of winter/spring exports on the Delta Smelt population. The overall intent for early warning surveys is to inform FWS and others whether, during weather events and freshets, substantial numbers of Delta Smelt are moving, or being moved, into areas potentially subject to entrainment. This information will allow exports to continue as long as Delta smelt are not in the area of influence of the pumps and result in additional exports. The early warning surveys were initiated in December 2014 and will continue through April 2015. FWS is also conducting additional Kodiak trawling at Jersey Point and Prisoner's Point. A Delta Smelt mark and recapture element may also be implemented in this monitoring program. A FWS proposal dated September 26, 2014, identifies resource needs totaling \$830,000. Reclamation, FWS, CDFW and DWR are collaborating to leverage available funds from all agencies and integrate Delta smelt and salmonid trawl efforts to improve efficiency.

Salmonids Near-term Drought Monitoring

Reclamation, NMFS, FWS, CDFW and DWR have been coordinating on long-term and near-term drought monitoring efforts. In WY 2014, various salmonid monitoring efforts (e.g., installation of temperature and dissolved oxygen probes adjacent to winter-run redds, implementation of a DCC gate operations trigger matrix, and increased beach seining and trawling efforts to determine the timing and magnitude of salmonid emigration into the Delta) were implemented in order to determine the effect of the drought and operations on the salmonids and to be able to make optimal real-time management decisions regarding operations and protection of the listed anadromous fish species.

Similar activities are planned for 2015, as long as drought conditions continue. Additional trawling and beach seining in the northern Delta, as well as more frequent sampling at rotary screw traps further upstream in the Sacramento River Basin, would accompany any modifications in operations of the DCC gates from those specified in the NMFS BiOp or D-1641. Temperature and dissolved oxygen probes are planned to be deployed within redds of fall-run and winter-run salmon, to monitor and allow for management of water conditions. An additional Kodiak trawl is planned for December to monitor distributions of Delta Smelt and salmonids, and the early warning trawling planned for Jersey Point and Prisoner's Point will monitor salmonid species as well. This early warning trawling will provide information from additional locations in the Delta about the presence of salmonids, which will help to inform management decisions about OMR reverse flows. Sampling frequency at salvage facilities at the export pumps may also be increased to provide more accurate information about entrainment impacts.

Other studies on migration paths and mortality will continue in 2015 for winter-run and spring-run salmon, as well as steelhead and sturgeon, to improve scientific knowledge about the population dynamics of these species. An enhanced particle tracking model that includes simulation of fish migration behavior will be tested in a pilot project to verify accuracy and the ability of the model to inform real-time management decisions. Using recent data, the upstream temperature model will also be recalibrated to improve its ability to predict temperature conditions in the Sacramento River. A feasibility study on the use of passive integrated transponders to monitor the movement and fate of salmonids will also be conducted in 2015 to determine if this technology could be usefully deployed in California to improve knowledge of salmonid populations.

In conclusion, the interagency group will conduct this monitoring in 2015 and beyond in order to improve our understanding of timing and distribution of species in the Delta, as well as inform targeted research and data gaps associated with risks associated with water operations.

3. **Other 2015 Drought-Related Measures**

Other drought-related measures have been discussed in the past as administrative actions. These actions are being taken as part of the Interagency 2015 Drought Strategy. The actions, taken as a whole, will increase the agencies' ability to operate the CVP and SWP in a manner that protects water quality and imperiled fish species while supporting and improving water supplies. The first category is a list of items first identified in late 2013 that will be continued in WY 2015.

➤ ***Status of August 2013 Items:***

- ***Incidental take to provide operational flexibility.*** Investigate a regression analysis based on measured turbidity in the Sacramento River and modeled OMR flows over an 18-year period to evaluate a new cumulative salvage index calculation. The current incidental take statement (ITS) in the 2008 FWS Biological Opinion calculates the incidental take limit (ITL) based on the cumulative salvage index (CSI) from three years, 2006-2008. Metropolitan Water District of Southern California and Reclamation staff have developed a new calculation utilizing 18 years of data to calculate the CSI. The new calculation was reviewed by environmental groups in October 2014 and was part of the RPA Annual Science Review on November 6 and 7, 2014.
 - ***Status:*** Adjustments and new analysis were performed based on comments from environmental groups and the public meeting of the Long-term Operations Annual Science Review. Reclamation submitted the proposal to FWS on November 21, 2014, requesting that FWS consider using this

new CSI calculation. If FWS concludes the proposal has merit, this new calculation could be utilized in calculating the ITL for 2015.

- ***Old and Middle River (OMR) Index.*** Reclamation and DWR developed the OMR Index Demonstration Project to test whether using an index rather than actual United States Geological Survey (USGS) gauge data to determine OMR flow enables compliance with the BiOps and the Longfin Smelt ITP.
 - *Status:* This project has been implemented since spring 2014. NMFS granted an initial trial period of one year, subject to modifications based on real-time information. An additional trial period of one year (WY 2015) will be requested. Operations will revert to the RPA should any unanticipated adverse effects occur to listed species. Results of the demonstration project will be presented to the independent review panel during the 2015 annual review expected in November 2015. Reclamation, FWS, NMFS, DWR and CDFW support this action.

- ***New and refined turbidity models.*** For predicting Delta Smelt salvage, develop a model to predict turbidity conditions that lead to entrainment events and determine the conditions likely to create a “turbidity bridge” for the Delta Smelt’s movement between the Central Delta and the export pumps. Further steps are intended to determine under what circumstances export operations can be managed to reduce turbidity intrusion, thereby increasing total seasonal water deliveries while maintaining adequate protection for Delta Smelt.
 - *Status:* The Metropolitan Water District of Southern California funded the agencies’ development of a model based on data from the period 2011-present that has been used to provide turbidity projections for the water projects. The current drought did not provide an opportunity or need to use the model in WY2014. Model results will be shared with the Delta Conditions Team in WY 2015. In addition, discussions are underway to develop tools to evaluate when “first flush” conditions are amenable to management intervention to protect seasonal water exports and Delta smelt. To provide better data for the model as well as to improve the ability to track smelt movement, additional monitoring sampling efforts are being planned in Suisun Marsh and the Central Delta.

- ***Temporary barrier(s).*** Installation of HORB to minimize movement of salmonids from the San Joaquin River into the South Delta.
 - *Status:* The spring HORB was installed every year from 2000-2004 and has been installed in six of the subsequent ten years (including in 2014). In two of those years, the bioacoustic fish fence served as the barrier. It

was not installed in the other four years. The Collaborative Science and Adaptive Management Process, through the Salmon Scoping Team, is currently developing an analysis of the HORB to identify data gaps concerning export effects on hydrodynamics and, if possible, recommend how such processes could be managed to minimize entrainment of salmonids with consequent reductions to predation and salvage. These analyses will supply information to better inform decisions regarding barrier placement and thereby potentially reducing constraints on water pumping.

- **Water transfers.** Water transfers in spring 2014 were considered on a case-by-case basis. It is anticipated that the need for additional water transfers in early WY 2015 could occur if dry conditions persist. For WY 2015, the agencies will continue to identify ways to streamline the water transfer approval process as much as practical.
 - *Status:* Due to continued dry conditions, unusually high river depletions in the Sacramento Valley, water quality conditions in the Delta and minimum exports through the summer 2014, some transfer water was diverted at the federal export facilities between July and September. As a result, Reclamation conducted environmental analysis to extend the period to convey transfer water across the Delta through November 15, 2014. This modification to the established transfer window in both the NMFS and FWS BiOps allowed the conveyance of approximately 75 to 90 TAF of additional transfer water (excluding carriage water) that has been retained in Shasta and Folsom reservoirs for export from the South Delta at the Jones Pumping Plant during WY 2015. Both NMFS and FWS concurred that this modification to the DOP would not result in additional adverse effects to salmon or Delta smelt or to any critical habitat beyond those analyzed in the biological opinions. CDFW also concurred that there would be no effect to existing CESA coverage for the SWP.
- **Delta smelt life cycle model.** Life cycle models allow more detailed and comprehensive evaluation of the effects of environmental and demographic variables on Delta smelt, as well as projecting the population-level consequences of potential management actions. Development of accurate life cycle models for Delta Smelt will allow the agencies to better tailor CVP/SWP water operations to protect the Smelt while supporting and improving water supplies.
 - *Status:* FWS is currently developing a Delta Smelt Life Cycle Model. An initial manuscript is expected to be submitted for peer review shortly, and a technical workshop was held on the model on October 27, 2014. Other

efforts are under development in the Collaborative Science and Adaptive Management Process. They include refinement and further evaluation of the Maunday & Deriso Delta Smelt model, the development of new model-based tools to predict Delta Smelt entrainment vulnerability, proportional entrainment of Delta Smelt depending on water operations and other factors, and population viability consequences of entrainment. These efforts are expected to reinforce each other, potentially providing important new information that can be considered in management decision-making, potentially during the current extended drought.

- ***Technology advances for smelt monitoring.*** The “early warning” monitoring described above addresses a specific informational need for managing water operations during the current drought; however, other informational needs related to Delta Smelt monitoring need to be addressed on a longer-term basis. The “standard” monitoring programs for Delta Smelt are in some cases many decades old, based on original efforts for species other than smelt, and based on sampling methods known to have significant shortcomings. Improving the assessment of smelt abundance and distribution, when coupled with life cycle and other model advancements, is expected to enable improved analysis and management of water operations that maximize exports while providing adequate protection for Delta Smelt. Improvements potentially include use of new sampling gears, random sampling protocols, increased survey efforts, and improved spatial coverage.
 - *Status:* Efforts currently underway at the five agencies and the Interagency Ecological Program include ongoing monitoring methods studies, drought-specific fish monitoring and early-warning monitoring for Delta Smelt.

FWS has initiated an investigation of monitoring gear efficiencies and Delta Smelt distribution with the expressed intent to better understand gear efficiency, distribution and effective monitoring approaches. Application of new information is highly likely to improve the monitoring programs upon which management decisions depend by introducing improved equipment, better sampling protocols and/or improved allocation of survey effort. Improved monitoring would potentially allow for more precisely targeted protective actions when necessary and better evaluation of the population-level impacts of water operations.

- ***Improve hatchery operational coordination with North of Delta diverters.*** Develop and implement a process for better future coordination of hatchery releases to improve survivability. In some instances, hatchery fish releases could

be better timed to coincide with adequate natural flows or other operational releases so as to result in greater fish survival.

- *Status:* In 2014, NMFS, CDFW and FWS developed criteria based on various operational, biological and environmental conditions that, when met, would likely result in extremely poor to non-existent in-river survival for out-migrating Chinook salmon. Based on these criteria, a large proportion of Chinook salmon produced at Central Valley hatcheries were trucked downstream and released at Rio Vista or San Pablo Bay. These criteria will be applied again in 2015 if similar conditions occur. Reclamation has initiated discussions with FWS' flow managers and hatchery managers to develop a *Hatchery and Operations Coordination Plan*. The plan will establish better coordination of hatchery fish releases to coincide with adequate natural flows or other operational releases. Better coordination would reduce the need for specific release of stored water as a separate effort for the hatcheries, as well as further harmonize water operations to support natural spawning of salmon runs. NMFS and FWS will continue to coordinate regarding the status of various NMFS RPA actions (e.g., the DCC gate operations) as they pertain to the consideration and determination of river release or trucking of hatchery fish. Reclamation and FWS will continue work on a coordination plan for implementation in WY 2015.
- ***Adjustment to water quality or flow objectives.*** Identify opportunities to collaborate to review and propose temporary modifications to state water quality or flow objectives in order to balance beneficial uses and avoid disproportionate drought impacts through continued operation. Reclamation will effectively coordinate with DWR, the SWP and CVP contractors, the state and federal fishery agencies, and the SWRCB. The goal is to balance risks and reduce disproportionately high water supply impacts or shift a significant fishery concern or water supply impact to another part of the system.
 - *Status:* In January 2014, Reclamation and DWR, in coordination with FWS, NMFS and CDFW, identified the need to file a TUC Petition to the Water Board. The proposal requested modification of the D-1641 outflow standards (outflow at 7,100 cfs starting February 1) which allowed for movement of the X2 salinity position further upstream into the central part of the Delta. This provided more flexibility in water operations and conserved storage in upstream reservoirs to conserve cold water pools for use later in the year to benefit fishery resources. The petition also requested flexibility in the operations at the DCC gates, providing additional opportunities to manage water quality (mainly salinity) in the

central part of the Delta. For 2015, Reclamation and DWR will continue to assess hydrological and operational conditions and coordinate with the appropriate agencies and stakeholders to effectively manage water quality in the Delta. Coordination will primarily occur at regular meetings of the RTDOMT, WOMT, and DOSS group and SWG. Additional meetings and briefings will occur as needed.

- ***Other drought related measures 2014-2015:*** In addition to the list above of drought operations and augmented science and monitoring plans, the agencies are undertaking the following additional inter-agency measures that will continue to be implemented in 2015:
 - ***Fisheries management and fish hatchery actions:*** CDFW, FWS and NMFS will meet on a weekly basis to coordinate on critical fisheries management and fish actions. These include, but are not limited to:
 - 1) Coordination on hatchery production and release strategies, including decisions on in-river releases versus trucking.
 - 2) Decisions on emergency angling restrictions if conditions remain dry
 - 3) Emergency monitoring strategies related to adverse in-river conditions, including permitting needs
 - 4) Winter-run Chinook contingency planning
 - 5) Fish rescues

The criteria (based on various operational, biological and environmental conditions) that NMFS, CDFW and FWS developed in 2014 to determine release location of hatchery Chinook salmon will be used again in 2015 if similar conditions occur. Reclamation, FWS' flow managers, and hatchery managers will develop and implement a *Hatchery and Operations Coordination Plan* in 2015 to establish better coordination of hatchery fish releases to coincide with adequate natural flows or other operational releases. Better coordination would reduce the need for specific release of stored water as a separate effort for the hatcheries as well as further harmonize water operations to support natural spawning of salmon runs. NMFS and FWS will continue to coordinate regarding the status of various NMFS RPA actions (e.g., the DCC gate operations) as it pertains to the consideration and determination of river release or trucking.

- ***Projects to reduce drought related effects on salmonids:***
 - 1) Preferential pumping at CVP. The amount of shifted pumping from Banks to Jones would be made available to the SWP.
 - 2) Water purchases (e.g., implementation of the San Joaquin River action from last year)

- 3) Predation related studies/pilot program, including Stanislaus River and lower San Joaquin River.
 - 4) Upstream priority restoration projects (from the Golden Gate Salmon Association, NCWA and CDFW lists).
 - 5) Non-physical barriers at DCC and Georgiana Slough.
- ***Voluntary Drought Initiative*** - NMFS and CDFW will continue to implement the Voluntary Drought Initiative in 2015. This initiative was started in 2014 to encourage minimum flow releases in priority salmonid watersheds where there is no ESA Section 7 nexus.
 - ***Accelerate two pilot projects to advance the use of forecast-based reservoir operations-*** In order to revise the storage and release strategies to improve available water supplies, DWR and Reclamation will accelerate components of the forecast-based reservoir reoperations evaluation. The purpose of these evaluations is to examine if shifting to forecast-based operations will enable the more efficient use of existing storage capacity within the system while still managing flood risks appropriately. DWR and BOR will work with NOAA (NWS, OAR, and NESDIS), USGS, and others as appropriate, in order to test the ability to shift to more precise real-time reservoir operations that can optimize benefits for water supply and flood risk management while also meeting real-time requirements for fish migrations as described above. This will be further developed in consultation with relevant agencies. One specific example includes the DWR System Reoperation Study.
 - ***Seasonal prediction for water resources*** – Using forecasts to better inform reservoir operations on the seasonal timescale requires forecasts with some amount of skill over climatology. In addition to skill, forecasts should be focused on watersheds important for water resources (e.g. the watersheds above the major reservoirs) and focus on, at a minimum, accumulated rainy season precipitation. During the rainy season, a frequently updating forecast for the precipitation expected for the remainder of the season is required. In partnership with DWR, USBR, and other operating agencies, NOAA should move toward developing such a forecast capability. This includes continuing to invest in research and development through NOAA/OAR as well as scoping operational implementation through NOAA/NWS and NOAA/NESDIS.
 - ***DWR System Reoperation Study-*** System reoperation is necessary to improve existing facilities in order to meet system needs more efficiently

and reliably and to better integrate the state's flood control and water supply management. In 2008, DWR was authorized by legislation to conduct a System Reoperation Study in order to analyze how changes influence the system, including the impacts of climate change, and in what ways the system can be optimized to meet water management goals. The study, which considered many reoperation concepts and strategies through a vetting process with experts, is moving four potential reoperation strategies forward for further evaluation including reoperations of Shasta reservoir, Oroville reservoir, New Exchequer Dam (Lake McClure), and further integration of SWP and CVP operations. The current phase of the study provides an evaluation of these potential strategies for benefits and ranking based on their performance in meeting state water management goals and objectives – including drought response efforts. The last phase of the study will focus on a reconnaissance-level assessment of the remaining strategies, including evaluating costs, quantifying economic benefits and developing conceptual designs.

- ***Continue and expand water conservation initiatives at the federal, state and local levels*** - While the 2015 Drought Strategy is focused on operations of the SWP and CVP, it is developed within the context that increased water conservation efforts is a critical aspect of drought response. Making conservation a “California way of life” is the first goal of the Governor’s 2014 California Water Action Plan (Plan) – a strategy setting state priorities and investments for the next five years. The Plan recognizes that with technological advances and a growing population, more can and should be done to increase conservation efforts within the state. Recent legislation, such as SBx7-7 (2007), has set standards requiring a 20-percent reduction in urban per capita water use by 2020, promoting expanded development of sustainable water supplies at the regional level, and requiring agricultural water management plans and efficient water management practices for agricultural water suppliers. The Plan prioritizes building and expanding on conservation efforts and ensuring water security at the local level through conserving and using water more efficiently, protecting habitat for local species, recycling water for reuse, capturing and treating storm water for reuse, and removing salts and other contaminants from brackish water and saltwater.

Next Steps

Following the release of the 2015 Interagency Drought Strategy, the agencies will continue public outreach in early 2015 to inform the planning of drought operations and implementation of the Drought Contingency Plan.