STATE OF CALIFORNIA
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
STATE WATER RESOURCES CONTROL BOARD

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**In the Matter of Specified License and Permits[1] of the Department of Water Resources and U.S. Bureau of Reclamation for the State Water Project and Central Valley Project**

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# MARCH 5, 2015 ORDER MODIFYING AN ORDER THAT APPROVED IN PART AND DENIED IN PART A PETITION FOR TEMPORARY URGENCY CHANGES TO LICENSE AND PERMIT TERMS AND CONDITIONS REQUIRING COMPLIANCE WITH DELTA WATER QUALITY OBJECTIVES IN RESPONSE TO DROUGHT CONDITIONS

**BY THE EXECUTIVE DIRECTOR**

## 1.0 INTRODUCTION

This Order modifies the State Water Resources Control Board's (State Water Board) Executive Director's February 3, 2015 Order (February 3 Order) that responded to a temporary, urgency change petition (TUCP) filed by the Department of Water Resources (DWR) and the United States Bureau of Reclamation (Reclamation) (Petitioners) on January 23, 2015 (January 23 Petition). The January 23 Petition requested changes to the conditions of the Petitioners' water right permits for the State Water Project (SWP) and Central Valley Project (CVP) (Projects) specified in State Water Board Decision 1641 (D-1641) that require the Petitioners to meet water quality objectives designed to protect fish and wildlife in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta). The February 3 Order approved the following changes for the months of February and March:

1. The minimum daily Delta outflow of 7,100 cubic feet per second (cfs) or equivalent salinity (2.64 millimhos per centimeter (mmhos/cm) at Collinsville), plus the requirement to meet higher flows of 11,400 cfs or equivalent salinity (2.64 mmhos/cm at Chipps Island) for a specified number of days depending on hydrology, was reduced to a minimum Delta outflow requirement of 4,000 cfs;
2. A minimum level of exports from the Delta when outflow is between 4,000 cfs and 7,100 cfs was approved at 1,500 cfs, as well as allowance of exports in compliance

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[1] The petition was filed for Permits 16478, 16479, 16481, 16482 and 16483 (Applications 5630, 14443, 14445A, 17512 and 17514A, respectively) of the Department of Water Resources for the State Water Project and License 1986 and Permits 11315, 11316, 11885, 11886, 11887, 11967, 11968, 11969, 11970, 11971, 11972, 11973, 12364, 12721, 12722, 12723, 12725, 12726, 12727, 12860, 15735, 16597, 20245, and 16600 (Applications 23, 234, 1465, 5638, 13370, 13371, 5628, 15374, 15375, 15376, 16767, 16768, 17374, 17376, 5626, 9363, 9364, 9366, 9367, 9368, 15764, 22316, 14858A, 14858B, and 19304, respectively) of the United States Bureau of Reclamation for the Central Valley Project.

with D-1641 levels when outflow is above 7,100 cfs provided that the flows are limited to natural and abandoned flows and the Delta Cross Channel (DCC) Gates are closed;
3. The requirement to close the DCC Gates was changed to allow the gates to be open under certain circumstances; and
4. The minimum San Joaquin River flow requirement at Vernalis was reduced from between 710 cfs or 1,140 cfs, depending on hydrology, to 500 cfs.

In 2014, the Executive Director approved the same changes to Delta outflow, Delta export, and DCC Gate requirements, and similar changes to San Joaquin River flow requirements. The State Water Board upheld these changes upon reconsideration. (State Water Board Order WR 2014-0029.) This year, Petitioners added an additional request to increase the maximum export rate to 3,500 cfs when Delta outflow is between 5,500 cfs and 7,100 cfs. The Executive Director denied this request. The background section of this order has a more complete summary of the January 23 Petition and the conditions leading up to it.

Subsequent to the issuance of the February 3 Order, the State Water Board received written comments, objections, and petitions for reconsideration. The State Water Board also held a public workshop to receive oral comments on the January 23 Petition and the February 3 Order. These comments along with updated hydrologic, biologic, and water supply information are being used to inform this update to the February 3 Order. Three major areas of concern have been raised with respect to the February 3 Order:

1. Whether or not the Executive Director should determine how any water saved by operating to adjusted standards under the February 3 Order may be used;
2. Whether or not export limits in the February 3 Order should be applicable to exports of water transferred between CVP and SWP contractors and pre-1914 appropriative water right holders; and
3. Whether or not Delta outflow and export requirements should be further adjusted to allow for an intermediate level of exports when Delta outflows fall below 7,100 cfs.

This Order modifies the February 3 Order to address the issues set forth above. Specifically, the provision specifying that the Executive Director shall determine the use of water conserved as a result of this approval is modified to specify that Petitioners shall use the conserved water in accordance with their 2015 Drought Contingency Plan and Temperature Management Plan for the Sacramento River. In addition, this Order clarifies that water transfers are not constrained by the export limits in the Order. This change is consistent with the approach taken in 2014. This Order does require that the Drought Contingency Plan prepared by the Petitioners be updated to account for this transferred water, and that the quantities, transferors, and transferees be reported monthly such that the State Water Board can consider the transfers in the context of the TUCP and make any necessary modifications to this Order to ensure that it complies with the required Water Code findings discussed below. For the reasons explained in more detail below, this Order makes limited modifications to the maximum export limits established in the February 3 Order.

The February 3 Order granted in part the Petitioners' request to shift natural and abandoned flows from estuarine protection to exports to mitigate some of the devastating water supply impacts that the drought is having on many communities. While the February 3 Order did not authorize the use of an additional intermediate export rate, this Order further considers and grants limited approval of this provision, consistent with the established state policy that every

human being has the right to safe, clean, affordable, and accessible water adequate for drinking, cooking, and sanitary purposes (Wat. Code, § 106.3). This Order authorizes the use of the intermediate export rate under very limited conditions. When Delta outflow is between 5,500 cfs and 7,100 cfs, the DCC Gates are closed, and DWR or Reclamation determines that additional water is necessary to meet minimum public health and safety needs, exports can be increased from 1,500 cfs up to 3,500 cfs, after notifying the Executive Director. The notification must describe the timing and amount of the increase, the beneficiaries of the increase and the purpose of use of the water.

In order to approve a TUCP, the State Water Board or its Executive Director, acting under delegated authority, must find (1) that there is an urgent need for the proposed changes, (2) that the changes will not injure any legal user of water, (3) that the changes will not result in unreasonable effects to fish and wildlife, and (4) that the changes are in the public interest. In determining whether the impacts of a change on fish and wildlife would be unreasonable, and whether the change would be in the public interest, the impacts of the change must be weighed against the benefits of the change to all beneficial uses, including fish and wildlife.

The February 3 Order and this Order achieve a reasonable balance of competing demands for the limited water supplies available during the ongoing drought, taking into consideration: (1) the impacts of reduced Delta outflows on estuarine species and migrating salmonids in the Bay-Delta, (2) the need to conserve water in upstream storage for multiple, critical purposes later in the year, including temperature control on the Sacramento River to protect endangered winter-run Chinook salmon, agricultural use, wildlife refuges, municipal and industrial use, and salinity control in the Delta, and (3) the need to export water for a variety of uses south of the Delta, including agricultural use, municipal and industrial use, and wildlife refuges.

As described below, all of the proposed changes are likely to have a negative effective on fish and wildlife. In particular, the importance of Delta outflow to estuarine resource protection is well documented in the Bay-Delta and in estuaries around the world. Positive relationships between outflow and abundance have been developed for several species including longfin smelt, starry flounder, Crangon shrimp, American shad, splittail and zooplankton.

Presently, estuarine fish populations are at record low levels and cannot be considered resilient at all. The delta smelt index is at an all-time low. The Longfin smelt index is at the second lowest level recorded. American shad, striped bass and threadfin shad are at near record low levels. Exports also negatively affect aquatic resources through hydrodynamic changes in the Delta and entrainment. The latest estimate of salmon and estuarine fish distribution show that high percentages of their populations are presently in the Delta. Of particular concern are the presence of delta smelt and winter-run and spring-run Chinook salmon. As mentioned, delta smelt are at their lowest abundance level on record. Given that they are an annual species, this is highly concerning. Further, last year, loss of temperature control below Shasta Reservoir and upstream of the Delta caused the loss of 95 percent of winter-run and high percentage of spring-run on the mainstem. The remnant populations of these fish that survived are in the Delta and need additional protection. The impacts of the proposed changes on fish and wildlife in the Bay-Delta must be weighed against the impacts to all beneficial uses of water if the changes are not approved.

California is in the midst of a significant, multi-year drought driven by the lack of rain and snowfall around the state. The drought is having devastating effects on communities, farmers,

farm workers, the fishing industry, and the environment and has caused substantial human suffering, including:

- Direct costs to agriculture total $1.5 billion (revenue losses of $1 billion and $0.5 billion in additional pumping costs). This net revenue loss is about 3 percent of the state's total agricultural value.
- The loss of 17,100 seasonal and part-time jobs related to agriculture represents 3.8 percent of farm employment.
- 428,000 acres, or 5 percent, of irrigated cropland is going out of production in the Central Valley, Central Coast and Southern California due to the drought.

The human face of suffering, tied to lack of drinking water and loss of jobs, was clearly evident at the February 18 workshop.

In the face of this drought, the California Department of Fish and Wildlife (CDFW), the United States Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS) (collectively fisheries agencies), and the State Water Board have coordinated with DWR and Reclamation to allow a number of adjustments to biological opinion and water right requirements in order to increase diversions from the Delta and conserve water in storage so that more water can be delivered to farms and communities. These adjustments have temporarily set aside a number of scientifically based, environmental protections developed as part of rigorous evidentiary proceedings and established in decisions that were ultimately upheld by the courts.

Most of what was requested by the Petitioners in the January 23 Petition was approved in the February 3 Order, including a reduction of all fish and wildlife outflow requirements to the Bay-Delta in February and March, to allow more water to be exported and more water to be held in storage for future water deliveries. Assuming continued dry conditions, the reduction in Delta outflow approved in the February 3 Order amounts to approximately 56 to 64 thousand acre-feet (TAF) of water. This one-to-one reduction in Delta outflow will result in savings of 23 to 46 TAF of water in upstream storage and 18 to 33 TAF in increased south of Delta export of natural and abandoned flows during this timeframe. In granting similar requests last year, approximately 400 TAF of water was made available for other uses during the course of the water year.

Conserving upstream storage is particularly important because water released from storage can serve multiple purposes, thereby maximizing the beneficial use of scarce water supplies. Specifically, water released from storage for temperature control to benefit salmon also can be used for agricultural or municipal purposes, or for salinity control in the Delta. Water diverted south of Delta can only be used for beneficial uses south of the Delta.

Under Petitioners' proposal to increase unconditionally the maximum export rate to 3,500 cfs when Delta outflow is between 5,500 and 7,100 cfs, natural and abandoned flows would be shifted on a one-for-one basis from estuarine protection to south of Delta export. Assuming continued dry conditions, this intermediate export proposal could shift up to an additional 3.2 TAF per day for up to 20 days in March, with the likely monthly tradeoff between Delta outflow and exports ranging from 47 to 59 TAF in March.

Another factor in evaluating the merits of the intermediate export proposal is that it is difficult to predict exactly where any additional Delta exports would be delivered. Any incremental increase in Delta exports would not necessarily offset water shortages in areas such as the

service area of the Friant Division of the CVP. Water delivered south of Delta follows a contractual priority similar to the water rights priority system, meaning that any additional quantity of water would be apportioned to the most senior class contractor, and would not be apportioned based on the greatest need. Physical constraints also limit where and how much water can be delivered.

Just as it is very difficult to determine a threshold at which changes made under this Order will tip the balance towards having an unreasonable effect on fish and wildlife, it is similarly difficult to determine a threshold beyond which a critical water supply need is, or is not, met. Although it is a simple matter to determine the per unit value of water for both an irrigation supply and a drinking water supply, there appears at this time to be no threshold quantity of water delivered south of Delta that tips the balance towards meeting all minimum health and safety needs. Just as for water needed to protect the ecosystem, so is it for overall public interest uses—more is better, as a specific threshold is unknown.

A number of stakeholders argued that the finding in the February 3 Order that the intermediate export rate would have unreasonable effects on fish and wildlife was inconsistent with the conclusions of USFWS, NMFS, and CDFW regarding the TUCP. Contrary to this argument, however, the fisheries agencies addressed only whether the proposed actions would be consistent with requirements under the federal Endangered Species Act (16 U.S.C.A. §§ 1531 et seq.) (ESA) and the California Endangered Species Act (Fish & Game Code, § 2050 et seq.) (CESA); the fisheries agencies did not address the broader question of whether the proposed changes would have unreasonable effects on fish and wildlife.

Pursuant to section 7 of the ESA, Reclamation obtained the concurrence of USFWS that the changes proposed in the TUCP for February and March would not result in any additional adverse effects on delta smelt or its critical habitat beyond those analyzed in the 2008 Biological Opinion on the Long-Term Operational Criteria and Plan for coordination of the CVP and SWP (USFWS BO). Similarly, Reclamation obtained NMFS's concurrence that the effects of the proposed actions on Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, North American green-sturgeon, and killer whales are within what was analyzed in the 2009 Biological Opinion and Conference Opinion on the Long-term Operation of the CVP and the SWP (NMFS BO), and that the proposed actions are not likely to jeopardize the continued existence of those species, or destroy or adversely modify their critical habitat. In addition, DWR obtained confirmation from CDFW that DWR could continue to rely upon existing CESA coverage under the consistency determinations for delta smelt and salmon and the incidental take permit for longfin smelt.

The concurrence letters submitted by the fisheries agencies support the conclusion that the proposed changes in Project operations will not jeopardize the continued existence of threatened and endangered species, but it does not necessarily follow that the changes will not have an unreasonable effect on fish and wildlife. Depending on the circumstances, the effect of a change on a given species may be unreasonable, even if the effect is not likely to cause the extinction of the species. In addition, the fisheries agencies did not address whether the proposed changes would have unreasonable effects on species of fish and wildlife that are not threatened or endangered. The fisheries agencies did, however, submit additional comments after the February 18 workshop. These comments reiterated that in their concurrence letters the fisheries agencies focused specifically on the operations proposed in the TUCP and their effects in relation to ESA and CESA authorizations for the SWP and CVP, and was not intended to address the potential for unreasonable effects on fish, wildlife and other instream beneficial

uses under the TUCP. These comments also identified additional information that the fisheries agencies have submitted to the State Water Board about the critical importance of freshwater flows to the Delta for a variety of species, and which the State Water Board may want to consider when making its determinations regarding unreasonable effects on fish and wildlife.

In light of the information summarized above, this Order finds that, although the changes approved will have a negative effect on fish and wildlife, the tradeoff, when weighed against the water supply benefits, strikes a reasonable balance between fish and wildlife protection and best serving other needs for water. This Order further finds that unconditional approval of intermediate exports would tip the balance too far in favor of exports, with resulting unreasonable effect on fish and wildlife. Approval of the intermediate export proposal is therefore conditioned upon the Petitioners notifying the Executive Director that additional water is necessary to meet minimum public health and safety needs, and including in this notification a description of the timing and amount of the increase, and the beneficiaries of the increase and the purpose of use of the water.

## 2.0 BACKGROUND

### 2.1 Bay-Delta Plan and D-1641

The Water Quality Control Plan for the Bay-Delta Estuary (Bay-Delta Plan) specifies water quality objectives for the protection of beneficial uses of water in the Bay-Delta, including fish and wildlife, agricultural, and municipal and industrial uses. The water quality objectives included in the Bay-Delta Plan were developed through a rigorous and extensive public process to determine the flow dependent water quality requirements that are needed to reasonably protect the beneficial uses of water in the Bay-Delta. During that process, the State Water Board considered and balanced the various beneficial uses of water under various hydrologic conditions and acknowledged that there would be tradeoffs, especially during dry conditions.

In Revised Decision 1641 (D-1641), based on various agreements that were reached by the Projects, the State Water Board amended the water right license and permits for the SWP and CVP to require the Projects to meet certain objectives in the Bay-Delta Plan.[2] Specifically, D-1641 places responsibility on DWR and Reclamation for measures to ensure that specified water quality objectives included in Tables 1, 2, and 3 of D-1641 are met, in addition to other requirements. The flow and water quality requirements established by the State Water Board in D-1641 are summarized in the tables and figures contained in Attachment 1 to this Order: Table 1 (Municipal and Industrial Beneficial Uses), Table 2 (Agricultural Beneficial Uses), and Table 3 (Fish and Wildlife Beneficial Uses). Included in Attachment 1 are the footnotes to Table 3 that refer to definitions and other requirements contained in Figure 1 (Sacramento Valley Water Year Hydrologic Classification), Figure 2 (San Joaquin Valley Water Year Hydrologic Classification), Figure 3 (Formulas for NDOI and Percent Inflow Diverted), and Table 4 (Chipps Island and Port Chicago Maximum Daily Average Electrical Conductivity).

The objectives are intended to protect fish and wildlife living in or migrating through the Bay-Delta, and also to keep the Delta and water exported from the Delta from getting too salty for municipal and agricultural uses. Analyses done to support the flow and salinity objectives in the Bay-Delta Plan and D-1641 were developed based on historic hydrologic conditions that

[2] D-1641 originally implemented the 1995 Bay-Delta Plan. Later, minor modifications were made to the plan in the 2006 Bay-Delta Plan that comport with D-1641.

included hydrologic conditions similar to the drought conditions experienced to date. However, the analyses did not include the additional constraints on Project operations that now exist under the USFWS BO and NMFS BO.. The analyses also did not account for the increased SWP demands that have been realized since the 1995 Bay-Delta Plan and D-1641 were adopted, or the large scale shifts from annual to permanent crops that have occurred since the 1995 Bay-Delta Plan and D-1641 were adopted that have increased the impacts of the drought on water users.

Delta Outflow Requirements

The Delta outflow objectives are intended to protect estuarine and migratory aquatic species and their habitat. Delta outflows affect migration patterns of both estuarine and anadromous species and the availability of suitable habitat for those species. The populations of several estuarine-dependent species of fish and shrimp vary positively with flow, as do other measures of the health of the estuarine ecosystem. Freshwater flow also is an important factor in cuing upstream migration of adult salmonids through the Delta, and in the downstream migration and survival of juvenile salmonids. Freshwater inflows also have chemical and biological consequences through the effects of inflows on loading of nutrients and organic matter, pollutant concentrations, and residence time.

Listed in Table 3 of the Bay-Delta Plan and D-1641, the Delta outflow objectives include year round requirements that vary by month and water year type. With some flexibility provided through a limited set of compliance alternatives, the basic outflow objectives require calculated minimum net flow from the Delta to Suisun and San Francisco Bays (the Net Delta Outflow Index or NDOI). During the late winter and spring, these flows may instead be met through achieving a maximum salinity level (measured as electrical conductivity or EC). Since salinity in the Bay-Delta system is closely related to freshwater outflows, both types of objectives are indicators of the extent and location of low salinity estuarine habitat important to estuarine species.

The Delta outflow objectives included in the Bay-Delta Plan and D-1641 for the February through June time frame are identified in footnote 10 of Table 3 and Table 4 of footnote 10. Pursuant to footnote 10, the minimum daily NDOI during February through June is 7,100 cfs calculated as a 3-day running average. This requirement may also be met by achieving either a daily average or 14-day running average EC at the confluence of the Sacramento and San Joaquin Rivers of less than or equal to 2.64 millimhos per centimeter (mmhos/cm) (Collinsville station C2). If the best available estimate of the Eight River Index for January is more than 900 thousand acre-feet (TAF), the daily average or 14-day running average EC at station C2 is required to be less than or equal to 2.64 mmhos/cm for at least one day between February 1 and February 14; however, if the best available estimate of the Eight River Index for January is between 650 TAF and 900 TAF, the Executive Director of the State Water Board is delegated authority to decide whether this requirement applies. Additional Delta outflow objectives are also contained in Table 4, which requires increasing outflows or reducing salinity levels as Delta inflows increase. Specifically, Table 4 requires a specified number of days of compliance with higher outflows of 11,400 cfs and 29,200 cfs or salinity of 2.64 mmhos/cm EC at Chipps Island and Port Chicago based on the previous month's Eight River Index. [3] The final Eight River

[3]Pursuant to footnote 9 of Table 3 of D-1641, the Eight River Index refers to the sum of the unimpaired runoff as published in the DWR Bulletin 120 for the following locations: Sacramento River flow at Bend Bridge, near Red Bluff; Feather River, total inflow to Oroville Reservoir; Yuba River flow at Smartville; American River, total inflow to Folsom

Index for January was 810 TAF, which resulted in a requirement for 1 day of compliance at Chipps Island pursuant to Table 4. Due to storm events in early February, this requirement was met along with 20 additional days of compliance with this requirement. The final Eight River Index for February is expected to be about 2.2 TAF. Based on this Eight River Index, Table 4 requires 31 days of compliance with 11,400 cfs or salinity compliance at Chipps Island in March. D-1641 specifies that excess compliance days from one month are to be applied to the next month. As such, the 20 additional compliance days from February will reduce the number of days of required compliance with 11,400 cfs or Chipps Island salinity to 11. Based on a February Eight River Index of 2.2 TAF, there will be no required days of compliance with the 29,200 cfs or Port Chicago requirement.

San Joaquin River Flow Requirements

The San Joaquin River Flow objectives at Airport Way Bridge, Vernalis from February through June are included in Table 3 of the Bay-Delta Plan and D-1641 and are intended to provide minimum net downstream freshwater flows in the San Joaquin River to protect fish and wildlife beneficial uses, including San Joaquin River salmonids. The objectives require a specified minimum monthly average flow rate based on the San Joaquin Valley Water Year Hydrologic Classification (at the 75 percent exceedance level) and include two levels. The higher flow level applies for the same number of days that any of the Delta Outflow requirements included in Table 4 apply (flow of 11,400 cfs or 29,200 cfs or salinity compliance at Chipps Island or Port Chicago). The current San Joaquin Valley Water Year Hydrologic Classification is critically dry. Per Table 3, the San Joaquin River flow requirement for February and March is 710 cfs or 1,140 cfs. As discussed above, in February 2015, the higher flow objective applied on 1 day and will apply on 31 days in March. Accordingly, the average monthly flow requirement during February was 725 cfs and will likely be 1,140 cfs for all of March.

DCC Gate Closure Requirements

The DCC Gates are located near Walnut Grove and at times allow for the transport of up to 3,500 cfs of water from the Sacramento River to Snodgrass Slough and the North Fork Mokelumne River to the interior Delta. The DCC was constructed in the early 1950s to convey Sacramento River water to the interior and southern Delta to improve water quality at the SWP and CVP export facilities. The DCC Gates also benefit recreational uses by providing boat passage. The DCC Gate objective was designed to protect fish and wildlife beneficial uses (specifically salmonids) while simultaneously recognizing the need for fresh water to be moved through the interior Delta to the southern Delta for SWP and CVP uses. The current objective is included in Table 3 of the Bay-Delta Plan and D-1641and requires that the DCC Gates be closed as follows: for a total of 45 days for the November through January period; from February through May 20; and for a total of 14 days for the May 21 through June 15 period. Opening the DCC Gates during winter and spring months can negatively affect juvenile salmonid survival by causing straying of those fish into the interior and then southern Delta where survival is much lower than for fish that stay in the mainstem of the Sacramento River. Opening the DCC Gates, however, significantly improves water quality (e.g. lowers salinity) in the interior and southern Delta including at the SWP and CVP export facilities and Contra Costa Water District's diversions, particularly when Delta outflow is low.

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Reservoir; Stanislaus River, total inflow to New Melones Reservoir; Tuolumne River, total inflow to Don Pedro Reservoir; Merced River, total inflow to Exchequer Reservoir; and San Joaquin River, total inflow to Millerton Lake.

Export Limits
The export limits objective listed in Table 3 of the Bay-Delta Plan and D-1641 includes requirements to limit the quantity of inflow that is diverted from the south Delta by the SWP and CVP pumping facilities to protect fish and wildlife uses. For the February through June time period, exports are required to be limited to 35 percent of Delta inflow unless the Executive Director allows for a variation upon concurrence of the fisheries agencies or an exception applies allowing for exports up to 45 percent in February of drier years, which included this year.

## 2.2 Drought Conditions, Water Supply Effects and Economic Effects

California is entering its fourth consecutive year of below-average rainfall and very low snowpack. Water Year 2015 is also the eighth of nine years with below average runoff, which has resulted in chronic and significant shortages to municipal and industrial, agricultural, and refuge supplies and historically low groundwater levels. As of February 24, 2015, 67 percent of the state is experiencing an Extreme Drought and 40 percent is experiencing an Exceptional Drought, as recorded by the National Drought Mitigation Center, U.S. Drought Monitor.

Of particular concern is the state's critically low snow pack which provides much of California's seasonal water storage. The South Section (San Joaquin, Kings, Kaweah, Kern, and Mono River watersheds) snow pack on March 3, 2015 was 22 percent of average for that date (California Data Exchange Center (CDEC), March 4, 2015). Central Section snowpack (Carson, Yuba, American, Mokelumne, Stanislaus, Tuolumne, Merced and Walker River watersheds) was 20 percent of average, and Northern Section snowpack (Trinity, Eel, Sacramento, Feather, and Truckee River watersheds) was 17 percent of average for this date.

In the Sacramento River watershed, Water Year 2012 was classified as below normal, Water Year 2013 was dry, and Water Year 2014 was critically dry. Historically, January and February are two of the three wettest months of the year. As of March 4, 2015, however, the Northern Sierra 8-Station Index was at 30.7 inches, 86 percent of average for this time of year (CDEC, March 4, 2015), despite the wet conditions in December and early February, due to the lack of any significant precipitation during the entire month of January and dry conditions for the remainder of February. While the storm event in early February improved water supply conditions to some extent, that storm did not improve snow pack.

The lack of precipitation the last several years has contributed to low reservoir storage levels in the Sacramento watershed. Shasta Reservoir on the Sacramento River, Oroville Reservoir on the Feather River, and Folsom Reservoir on the American River were at 58, 49 and 58 percent of capacity, respectively, on March 1, 2015 (79, 71, and 104 percent of average for February, respectively). Trinity Lake (water from the Trinity system is transferred to the Sacramento River system) on the Trinity River is at 47 percent of capacity and 63 percent of the February average.

The San Joaquin River Watershed in particular has experienced severely dry conditions for the past three years. Water Year 2012 was classified as dry and Water Years 2013 and 2014 as critically dry. As of March 4, 2015, the San Joaquin Valley 5-Station Index is at 13.4 inches, 47 percent of average for this time of year (CDEC March 4, 2015). The lack of precipitation in the last few years has contributed to low reservoir storage levels throughout the watershed. New Exchequer Reservoir on the Merced River, New Don Pedro Reservoir on the Tuolumne River, New Melones Reservoir on the Stanislaus River, and Millerton Reservoir on the upper San Joaquin River were at 8, 43, 25 and 38 percent of capacity, respectively (16, 61, 41, and 58 percent of average for February, respectively).

The 2014 and 2015 February storage amounts in the major SWP and CVP reservoirs are shown in the table below.

**Storage amounts in Major SWP and CVP Reservoirs in TAF**

| Reservoir | February 2014 | February 2015 | Change in Storage |
|---|---|---|---|
| Trinity (CVP) | 1,180 | 1,139 | -44 |
| Shasta (CVP) | 1,731 | 2,598 | +867 |
| Oroville (SWP) | 1,389 | 1,725 | +336 |
| Folsom (CVP) | 290 | 561 | +271 |
| New Melones (CVP) | 1,058 | 605 | -453 |
| San Luis (CVP) | 370 | 362 | -8 |
| San Luis (SWP) | 306 | 919 | +613 |
| Millerton (CVP) | 172 | 194 | +22 |
| Total | 6,496 | 8,103 | +1,604 |

Current storage in Shasta, Oroville, and Millerton reservoirs is greater than in February 2014, but as discussed above remains low compared to long term historical conditions. Folsom Reservoir storage is greater than in February 2014, and it is about equal to long term historical conditions. Storage in Trinity and New Melones reservoirs is lower than in February 2014. The February 50 percent, 90 percent, and 99 percent exceedance forecasts for 2015 project reservoir volumes throughout spring and summer operations that are below their historic averages for those months. These low initial storage levels and historically dry conditions will likely lead to critical water shortages in 2015. Forecasts for Water Year 2015 indicate it is increasingly likely to again be a dry year. Due to the expected dry hydrology, Reclamation and DWR stated in their TUCP that there is great risk that water supplies will not be adequate to meet all of the obligations of the Projects.

With respect to water supplies, in 2014, DWR delivered 5 percent of its long-term contractor delivery requests and 100 percent to its Feather River senior settlement contractors. In 2014, Reclamation delivered no water to its (non-settlement) agricultural contractors and 50 percent to municipal and industrial contractors. Reclamation also delivered 75 percent to its settlement contractors and 65 percent to the exchange contractors on the San Joaquin River. Wildlife refuges received 65 to 75 percent depending on the location.

For 2015, the long-term (Table A) SWP contract requests total nearly 4.2 MAF. On January 15, 2015, DWR announced 2015 allocations of 15 percent (up from 10 percent earlier in the year) of most SWP contractors' requests for Table A water amounts, for a total initial allocation of nearly 636 TAF. On March 2, 2015, DWR increased the allocation of 2015 SWP water for its long-term

contractors to 20 percent, an increase of 204 TAF, for a total initial allocation of 840 TAF. These increases in the initial allocation were due to precipitation from the early-December and early-February storms and the subsequent increase in reservoir storage from that runoff. In 2015, DWR currently expects to deliver 100 percent of requests to its Feather River settlement contractors. These projections are based on a 90 percent probability of exceedance hydrology and may change as water supply conditions change. On February 27, 2015, Reclamation announced that the initial 2015 water supply allocation for its agricultural and municipal contractors is 0 and 25 percent, respectively. Settlement and exchange contractor deliveries will also potentially be reduced if additional significant precipitation does not occur.

On July 15, 2014, the University of California Davis Center for Watershed Sciences released a report estimating the effects of the drought in 2014 on Central Valley farm production and providing data about effects of the drought in coastal and southern farm areas. The report also forecasted the drought's economic fallout through 2016. Key findings of the drought's effects in 2014 include:

- The total statewide economic cost of the drought in 2014 was $2.2 billion.
- Direct costs to agriculture totaled $1.5 billion of which $1 billion were due to revenue losses and $0.5 billion were due to additional pumping costs. This net revenue loss was about three percent of the state's total agricultural value.
- 17,100 seasonal and part-time jobs related to agriculture were lost representing 3.8 percent of farm unemployment.
- Approximately 428,000 acres, or five percent, of irrigated cropland went out of production in the Central Valley, Central Coast and Southern California.
- The Central Valley was hardest hit, particularly the Tulare Basin, with estimated losses of $800 million in crop revenue and $447 million in additional well-pumping costs.
- Statewide dairy and livestock losses from reduced pasture and higher hay and silage costs represented $203 million in revenue losses.

### 2.3 Governor's Executive Orders

On January 17, 2014, Governor Brown issued a Drought Emergency Proclamation that directed the State Water Board, among other things, to consider petitions, such as the TUCP, to modify requirements for reservoir releases or diversion limitations that were established to implement a water quality control plan. As indicated in the Proclamation, such modifications may be necessary to conserve cold water stored in upstream reservoirs that may be needed later in the year to protect salmon and steelhead, to maintain water supplies, and to improve water quality. As authorized by Government Code section 8571, the Governor's Proclamation also suspended the California Environmental Quality Act (CEQA), and the regulations adopted pursuant to it, to the extent that CEQA otherwise would have applied to specified actions necessary to mitigate the effects of the drought, including the State Water Board's action on the TUCP. In addition, the Governor's Proclamation suspended Water Code section 13247 to the extent that it otherwise would have applied to specified activities, including action on the TUCP. Section 13247 requires state agencies, including the State Water Board, to comply with water quality control plans unless otherwise directed or authorized by statute.

On April 25, 2014, the Governor issued a Proclamation of a Continued State of Emergency to strengthen the state's ability to manage water and habitat effectively in drought conditions and called on all Californians to redouble their efforts to conserve water. In the April Proclamation,

the Governor ordered that the provisions of the January 17, 2014 Proclamation remain in full force and also added several new provisions.

On December 22, 2014, Governor Brown issued Executive Order B-28-14, which extended the waiver of CEQA and Water Code section 13247 contained in the January 17, 2014 and April 25, 2014 Proclamations through May 31, 2016.

### 2.4 2014 TUCPs and Drought Contingency Plan

On January 31, 2014, the Executive Director conditionally approved a TUCP to modify the conditions of the water right permits for the SWP and the water right license and permits for the CVP. The approval temporarily modified Delta flow and water quality requirements to address critically dry conditions associated with California's ongoing drought. As the result of changed circumstances and subsequent requests from DWR and Reclamation, and in response to objections to the TUCP Order, the Executive Director modified the TUCP Order on February 7, 2014, February 28, 2014, March 18, 2014, April 9, 2014, April 11, 2014, April 18, 2014, May 2, 2014, and October 7, 2014 to extend and change the conditions of the TUCP Order. In the May 2, 2014 TUCP Order, the Executive Director renewed the TUCP Order, which subsequently expired on January 27, 2015.

On September 24, 2014, the State Water Board adopted Order WR 2014-0029, which addressed objections to and denied petitions for reconsideration of the Executive Director's January 31, 2014 TUCP Order and subsequent modifications thereto. While Order WR 2014-0029 denied the petitions for reconsideration, the Order did make some modifications to the TUCP Order in response to issues raised by some of the petitioners and other commenters in order to improve planning and coordination at that time and in the future if dry conditions were to continue. Specifically, the Order required the preparation of a Water Year 2015 Drought Contingency Plan in the event of continued drought conditions. The Order required the Drought Contingency Plan to identify planned minimum monthly flow and storage conditions that consider Delta salinity control, fishery protection, and supplies for municipal water users related to projected flow and storage conditions. The Order required the Petitioners to submit a plan for the beginning of the water year by October 15, 2014, and to submit a plan for the remainder of the water year by January 15, 2015, with updates as needed. Both Drought Contingency Plans were submitted as required. The January 15, 2015 Drought Contingency Plan identified likely 2015 TUCP requests by the Petitioners by month for the 50 percent, 90 percent, and 99 percent exceedance hydrologic scenarios. Each of these forecasts project monthly storage levels, reservoir releases, Delta pumping rates, and Delta outflow through the end of September 30, 2015. The January 15, 2015 Drought Contingency Plan indicated that much is still unknown about the hydrology for this year; therefore all specific changes to water right requirements that may be requested are also still unknown.

### 2.5 Substance of the Temporary, Urgency Change Petition

As summarized in the introduction to this Order, the January 23 TUCP requested temporary changes to conditions of the water right permits and license for the SWP and CVP that require the Projects to meet certain water quality objectives in the Bay-Delta Plan. The Petitioners requested these temporary changes in February and March, and identified possible future change requests for the period from April to September. The TUCP was filed pursuant to Water Code section 1435 et seq.

According to the TUCP, the proposed changes are being requested to: 1) conserve storage in upstream reservoirs for use later in the year if the drought continues; 2) ensure that salinity

levels in the Delta are maintained at levels that protect public health and safety; and 3) lessen critical economic losses to agricultural, 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.

The Petitioners requested the following temporary changes to requirements that were imposed pursuant to D-1641:

- The Petitioners requested modification of the minimum monthly NDOI during February and March to be no less than 4,000 cfs.

- The Petitioners requested a minimum monthly San Joaquin River flow of 500 cfs during February and March.

- The Petitioners requested modification of the DCC Gate closure requirements to allow the DCC Gates to be opened during February and March as necessary to reduce intrusion of high salinity water into the Delta in order to preserve limited storage in upstream reservoirs. The Petitioners proposed to use the DCC Gate Triggers Matrix as described in Appendix G of the April 2014 Drought Operations Plan and Operational Forecast to determine operation of the DCC Gates in consultation with the Real Time Drought Operations Management Team (RTDOMT) (described below).

- The Petitioners proposed to add the following additional export requirements, to be applicable when different levels of Delta outflow are maintained:

    a. When an NDOI of at least 5,500 cfs is not being met or the DCC Gates are open, the combined maximum SWP and CVP export rate for SWP and CVP contractors at the Clifton Court Forebay Intake and C.W. “Bill” Jones Pumping Plant SWP and CVP export rate would be no greater than 1,500 cfs.
    b. When footnote 10 of Table 3 and Table 4 of footnote 10 of D-1641 are not being met, but NDOI is greater than 5,500 cfs and the DCC Gates are closed, the combined maximum SWP and CVP export rate for SWP and CVP contractors at the Clifton Court Forebay Intake and C.W. “Bill” Jones Pumping Plant would be no greater than 3,500 cfs on a 3-day running average.
    c. When precipitation and runoff events occur that allow the DCC Gates to be closed and footnote 10 of Table 3 of D-1641 is being met [3-day average Delta outflow of 7,100 cfs, or electrical conductivity of 2.64 mmhos/cm 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 would be permitted up to D-1641 export limits contained in Table 3, and in compliance with other applicable laws and regulations including ESA and CESA.

- Additional potential changes from April through September 30 are described in the January 15, 2015 Drought Contingency Plan and referenced in the TUCP, which may be considered by the Executive Director or the State Water Board in the future. Potential future requests under various hydrologic scenarios (50, 90, and 99 percent

exceedances) are identified in the Drought Contingency Plan and TUCP, but will depend on actual hydrology. According to the TUCP, potential future requests to modify D-1641 requirements include: (1) additional requests to modify Delta outflows to balance upstream storage and fish protection, (2) requests to move the compliance point for the Western Delta agriculture salinity objective from Emmaton to Three-Mile Slough, (3) additional requests to modify San Joaquin flows at Vernalis, and (4) requests to modify Rio Vista flow requirements. Additionally, the Petitioners may exercise the flexibility provided in D-1641 to adjust the export limits to modify required averaging periods for sporadic storm events.

The TUCP also identified a number of additional actions the Petitioners plan to take in response to the dry conditions including: managing upstream reservoirs to conserve storage; water supply actions for contractors and refuges; preferential pumping at the SWP and CVP facilities to reduce fisheries impacts; temporary emergency drought barriers to reduce the need for upstream storage releases to repel salinity; hatchery operations to mitigate for drought impacts to fish resources; transfers and exchanges to mitigate for water supply impacts; and actions related to Trinity River releases consistent with existing requirements.

### 2.6 February 3, 2014 Order

On February 3, 2015, the Executive Director issued an order that took action on the January 23 TUCP. The February 3, 2015 Order approved the following temporary changes to D-1641 requirements during February and March:

- The minimum daily average net Delta outflow requirement of 7,100 cfs or equivalent salinity specified in footnote 10 of D-1641, plus the requirement to meet higher flows of 11,400 cfs or equivalent salinity at Chipps Island for a certain number of days specified in Table 4 of D-1641, was reduced to a minimum Delta outflow requirement of 4,000 cfs;
- When D-1641 requirements are not being met, the maximum rate of export from the Delta was limited to: (a) 1,500 cfs when Delta outflow is between 4,000 cfs and 7,100 cfs or the DCC Gates are open, or (b) up to the D-1641 limits when the DCC Gates are closed and Delta outflow is above 7,100 cfs but the additional requirements included in Table 4 are not met except that those diversions are limited to natural and abandoned flows;
- The requirement to close the DCC Gates was changed to allow the gates to be open under certain circumstances; and
- The minimum San Joaquin River flow requirement at Vernalis was reduced from 710 or 1,140 cfs, depending on hydrology, to 500 cfs.

The February 3 Order did not approve the requested intermediate export level of 3,500 cfs when NDOI is at least 5,500 cfs.

### 2.7 Status of Fish Species and Biological Reviews

The extreme drought conditions that have been occurring for the last four years are having significant impacts on fish and wildlife. Reclamation submitted two reviews dated January 27, 2015, entitled “Smelt Supporting Information for Endangered Species Act Compliance for Temporary Urgency Change Petition Regarding Delta Water Quality” and “Salmonid and Green Sturgeon Supporting Information for Endangered Species Act Compliance for Temporary Urgency Change Petition Regarding Delta Water Quality” (Biological Reviews) evaluating the potential effects of the TUCP on fish species listed as threatened or endangered under the ESA

and CESA. These species are also thought to be indicators of conditions for aquatic species in general in the Delta. Below is a summary of some of the significant conclusions from the Biological Reviews that was included in the February 3 Order and more recent information related to the status of the species and the potential effects of the TUCP.

Delta Smelt

The population of delta smelt, which is listed as threatened under both ESA and CESA, has reached record low numbers, as measured by the Fall Midwater Trawl (FMWT),[4] which began in 1967, and the first two surveys of the Spring Kodiak Trawl (SKT).[5] This is of particular concern because delta smelt are annual species, so reduced survival in one year can have significant effects on the population over the long term. Further, few delta smelt have been detected in the Cache Slough and Liberty Island complex and Sacramento Deep Water Ship Channel (n=8 in the first two SKT surveys), locations that in previous years have been considered a spatial refuge for delta smelt, especially from the effects of entrainment and the Project pumping facilities. Information from the Smelt Working Group (SWG; SWG notes, February 23, 2015)[6], continues to indicate that the centroid of the delta smelt population distribution is within the potential influence of the Project export facilities, making the condition of and risks to the delta smelt in the lower Sacramento River and San Joaquin River of greater importance to the overall status of the species. Storm events in December were thought to have stimulated a pre-spawning migration of delta smelt that expanded the population west and east of its centroid, which led to increased entrainment at Project facilities this water year that was not observed last water year. Further, delta smelt captured in trawl surveys during 2014 were reported to have been in relatively poor condition and of smaller size than in previous years, which indicates a potential for lower fecundity and survival of offspring in 2015.

During an increase in the CVP pumping rate between February 19 and 22, 2015, a delta smelt was salvaged in a ten minute sample at the CVP facilities on February 21, 2015, which translates to an estimated expanded salvage of twelve. This salvage event suggests strong delta smelt presence in the southern Delta and could possibly indicate undetected entrainment at the SWP (SWG notes, February 23, 2015) where most fish are preyed upon in the Clifton Court Forebay (CCF) before making it to the fish salvage facilities. The salvage numbers also do not reflect predation in the southern Delta outside of the CCF which is likely very significant for delta smelt and other species. The second SKT survey, conducted from February 9 to 12, 2015, and Early Warning Survey (EWS) catches at Jersey Point provide further evidence that delta smelt are present in the south Delta (SWG notes, February 23, 2015) and are at risk of both direct entrainment at the Project facilities and at risk of high predation from indirect Project

[4] The CDFW has conducted the FMWT survey to index the fall abundance of pelagic fishes nearly annually since 1967. FMWT equipment and methods have remained consistent since the survey's inception, which allows the indices to be compared across time. The FMWT conducts monthly surveys from September through December. The annual abundance index is the sum of the September through December monthly survey indices.

[5] The SKT has sampled annually since its inception in 2002. The SKT determines the relative abundance and distribution of spawning delta smelt. The SKT samples 40 stations each month from January to May. These 40 stations range from San Pablo Bay upstream to Stockton on the San Joaquin River, Walnut Grove on the Sacramento River, and the Sacramento Deep Water Ship Channel.

[6] The SWG consists of experts in delta smelt biology from the USFWS, Reclamation, U.S. Environmental Protection Agency, DWR, NMFS, and CDFW. The SWG evaluates up-to-date biological and technical issues regarding delta and longfin smelt and develops recommendations for consideration by the USFWS in its implementation of the USFWS BO.

effects that cause fish to enter the interior Delta. The SWG indicated that the risk of entrainment for delta smelt was elevated for the week of February 23, 2015.

Because of elevated water temperatures from the drought and the pre-spawn migration that occurred, an early spawning event is expected this year, which will expose both adult delta smelt and eggs to the changes considered under the TUCP. In January, the SWG indicated that they expected that delta smelt would remain in the central and south Delta in preparation for spawning as long as conditions remain turbid during February and March (SWG notes, January 5, 2015). Recently, some delta smelt sampled at Jersey Point were reported to have expressed eggs and milt, suggesting that spawning is occurring (SWG notes, February 23, 2015). According to the Biological Reviews, continued reduced Delta outflows proposed in the TUCP are expected to cause the centroid of the delta smelt population to shift inland, exposing a greater proportion of the population to entrainment if the distribution does not shift back into the Sacramento River in response to lower outflow and higher water transparency. The Biological Reviews indicated that potential impacts from entrainment were expected to be higher in February than March because more delta smelt spawning was expected in February than in March.

According to the Biological Reviews, with the DCC Gates closed adult delta smelt entrainment would be expected to be low if NDOI is between 4,000 cfs and 5,500 cfs and pumping remains at 1,500 cfs. However, under turbid conditions, if pumping were to increase on the ascending limb of the hydrograph in response to increased NDOI between 5,500 and 7,100 cfs, model results indicated that if delta smelt are east of Franks Tract, upward of 70 percent of adults would be at risk of entrainment. However, according to the Biological Reviews and subsequent monitoring, the special and first two regular SKT surveys showed that the majority of delta smelt were distributed around Decker Island and the confluence of the Sacramento and San Joaquin Rivers. The Biological Reviews concluded that as long as the proposed operations do not draw delta smelt into the San Joaquin River in the vicinity of Prisoner's Point, it would be unlikely that delta smelt distribution would change in a way that would increase their entrainment risk. It is worth note however, that there were no delta smelt caught at Prisoners Point immediately preceding the salvage event on February 21, 2015. The Biological Reviews called for continued monitoring and evaluation to inform real-time operations.

Longfin Smelt

Longfin smelt, which is listed as threatened under CESA and is a candidate for listing as threatened or endangered under ESA, experienced its second lowest FMWT index in 2014. According to the Biological Reviews, reductions in flows associated with the TUCP were expected to shift the centroid of the longfin smelt population inland which would expose a greater proportion of the adult population to entrainment at the Project facilities. The primary concern for entrainment however was for larval and juvenile longfin smelt. The Biological Reviews also found that based on the longfin smelt distributions at the time, a reduction in outflows was expected to result in an elevated risk of entrainment of larvals and juveniles during February and March. The Biological Reviews also stated that the strong and consistent relationship between outflows and survival of juvenile to age-1 longfin smelt, also supported the conclusion that reductions in outflows this year will reduce the survival of these fish (Jassby et al. 1995, Kimmerer 2002, McNally et al. 2010). However, detection of larval longfin smelt in the Cache Slough Complex and the distribution of adults indicated that the larval population was likely to be widely dispersed during February and March. Therefore, operations were not expected to affect the species population as heavily as may be the case with delta smelt unless a greater percentage of the population migrated into the lower San Joaquin River. The

Biological Reviews concluded that entrainment risk of adult longfin smelt is likely to be low unless their distribution narrowed and shifted further into the interior and south Delta.

Salmonids and Green Sturgeon

The endangered winter-run Chinook salmon is of particular concern during dry years. Winter-run inhabit the upper reaches of the Sacramento River below Keswick Dam and are entirely dependent on adequate temperature and flow conditions below the dam for their survival. Despite temperature modeling that indicated that temperatures could be maintained below 56 degrees throughout the 2014 temperature control season immediately below the dam under the conditions that existed last year, temperature control was lost several weeks before the end of the egg incubation life stage last year. As a result, the 2014 winter-run brood year (BY) is estimated to have experienced 95 percent mortality. This is of particular concern given winter-run's endangered status and extremely limited distribution, reducing the resilience of this species to withstand impacts, especially during a prolonged drought. According to the Delta Operations for Salmonids and Sturgeon team (DOSS)[7] , it is currently estimated that 95 percent of the naturally produced surviving winter-run are in the Delta, with 45-65 percent of the hatchery produced winter-run also in the Delta(DOSS notes, March 3, 2015). Based on historical Delta exit timing and warming water temperatures, naturally- and hatchery-produced winter-run Chinook are likely to be actively migrating through mid-March, and will likely be more vulnerable to entrainment during this period than rearing salmonids (DOSS notes, February 17, 2015), especially at lower flows and high export levels (higher reverse Old and Middle River flows) (DOSS notes, March 3, 2015). At this time, adult winter-run are also starting to enter the Sacramento River system and have begun to migrate to the upper reaches of the river. These adult winter-run must hold in the upper Sacramento River below Keswick Dam until they are ready to spawn during the summer. These fish require cold water holding habitat for several months prior to spawning to allow for maturation of their gonads, and then subsequently require cold water to ensure the proper development of their fertilized eggs, which are highly sensitive to thermal conditions during this embryo development period. Adults returning to the river in 2015 are predominantly members of the cohort from BY 2012 (assuming a 3-year cohort cycle). Based on cohort replacement rate (CRR)[8] estimates, BY 2012 had the fifth lowest CRR since 1992, making this run of particular concern.

The 2014 spawning run of spring-run Chinook salmon returning to the upper Sacramento River also experienced significant impacts due to drought conditions as well as from sedimentation resulting from rain events in late October through December that covered eggs leading to mortality. According to the Biological Reviews, the run was lower in four of seven locations compared to the 2013 escapement,[9] with considerably lower escapement observed in the Butte Creek and Feather River Hatchery. Spring-run eggs in the Sacramento River underwent significant, and potentially complete, mortality due to high water temperature downstream of

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[7] Delta Operations for Salmonids and Sturgeon (DOSS) is a technical advisory team that provides recommendations to WOMT and NMFS on measures to reduce adverse effects of Delta operations of the CVP and SWP to salmonids and green sturgeon and coordinates the work of the other technical teams.

[8] An evaluation of one spawning generation compared to the next is known as the CRR. It is a parameter used to describe the number of future spawners produced by each spawner. This spawner-to-spawner ratio is defined by the number of naturally produced and naturally spawning adults in one generation divided by the number of naturally spawning adults in the previous generation. The ratio describes the rate at which each subsequent generation, or cohort, replaces the previous one, and can be described as a natural cohort replacement rate.

[9] Escapement refers to that portion of an anadromous fish population that returns from the ocean and reaches the freshwater spawning grounds.

Keswick Dam starting in early September when water temperatures exceeded 56 degrees Fahrenheit. Extremely few juvenile spring-run Chinook salmon have been observed this year migrating downstream on the Sacramento River during high winter flows, when spring-run originating from the upper Sacramento River, Clear Creek, and other northern tributaries are typically observed, which presents a significant concern for the population. Based on the currently available data, the majority (70 percent) of yearling and young of the year (80-95 percent) of spring-run are estimated to be in the Delta, while only a few stragglers remain upstream of Knights Landing on the upper Sacramento River and about 30 percent of yearling and 5 percent of young of the year have already exited the Delta (DOSS notes, March 3, 2015).

Steelhead and green sturgeon have also likely been affected by the drought, but given the difficulty in sampling for these fish it is problematic to determine exactly how the species have been affected. Salvage of both naturally- and hatchery-produced steelhead have increased during February, although salvage of naturally-produced steelhead remains well below the level that requires the reinitiation of consultation under the NMFS BO. Impacts to other species, including commercially important fall-run are also expected as a result of the drought. If these impacts are severe enough they could result in significant impacts to the commercial and recreational fishing industry.

According to the Biological Reviews, both positive and negative effects of the TUCP were expected on salmonids and green sturgeon during February and March. The TUCP changes were expected to affect the abundance and spatial distribution of juvenile winter-run and spring-run Chinook salmon, steelhead, and green sturgeon. The modifications to outflows and DCC Gate operations were also expected to affect the spatial distribution and abundance of adult winter-run Chinook salmon and green sturgeon. Life history diversity of steelhead was also expected to be affected due to reduced survival through the San Joaquin River migration corridor. The modification of outflow, exports, and Vernalis flows were also expected to reduce survival of juvenile listed salmonids, steelhead and green sturgeon, and to modify their designated critical habitat. The modification of juvenile winter-run and spring-run Chinook salmon and steelhead survival due to changes in outflow were expected to occur primarily in migratory corridors in the north Delta due to increased entrainment into the interior Delta. Steelhead survival was also expected to be reduced along the mainstem of the San Joaquin River downstream of the Stanislaus River leading to increased entrainment of steelhead toward the Project pumping facilities.

The Biological Reviews also indicated that there may be impacts from opening the DCC Gates on Sacramento River origin salmonids from straying and entrainment. However, the Biological Reviews concluded that those effects would be minimized due to compliance with the DCC Gate operations matrix which limits opening of the DCC when migrating ESA-listed salmonids are present in the lower Sacramento River region. Further, during the period the gates are open, exports are proposed to be limited to 1,500 cfs. This export limit along with the implementation of the DCC Gate Triggers Matrix was expected to minimize entrainment of existing rearing fish in the interior and south Delta. However, the Biological Reviews concluded that operations of the DCC Gates may still cause straying of adult winter-run and green sturgeon.

While there may be impacts from modifications to outflows, San Joaquin River flows and opening of the DCC on salmonids and other species, the Biological Reviews concluded that these effects would be offset by increased storage in Project reservoirs which will help to maintain water temperatures necessary for Chinook salmon, steelhead, and green sturgeon

over the summer and fall of 2015. The Biological Reviews concluded that without the changes to outflows, the low reservoir storage conditions would likely result in extremely high egg mortality or even complete failure of natural BY 2015 spring-run Chinook and winter-run Chinook below Keswick Dam due to high water temperatures. Relaxation of Delta outflow requirements and San Joaquin River flow requirements, while still continuing to meet required tributary releases from Oroville, Folsom, and New Melones, was projected to enhance the opportunities for summertime cold water management across Project reservoirs in 2015.

With respect to the proposed modifications to exports, the Biological Reviews found that unmeasured mortality of salmonids in the south Delta region may increase as a result of increased entrainment towards the Project facilities under the proposed intermediate export rate of 3,500 cfs when NDOI is between 5,500 and 7,100 cfs. The Biological Reviews also found that mortality may increase due to long transit times on the San Joaquin River where exposure to degraded habitat and predaceous species is constant. The Biological Reviews concluded that under exports of 1,500 cfs with NDOI of 5,500 or less, reduced entrainment and salvage of listed species at the Project fish collection facilities adjacent to the South Delta export facilities would be expected due to increased positive flows in the south and central Delta.

## 3.0 APPLICABILITY OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) AND WATER CODE SECTION 13247

Ordinarily, the State Water Board must comply with any applicable requirements of CEQA prior to issuance of a temporary urgency change order pursuant to Water Code section 1435. (See Cal. Code Regs., tit. 23, § 805.) The Governor's December 22, 2014 Executive Order extended the waiver of CEQA and Water Code section 13247 contained in the January 17, 2014 and April 25, 2014 Proclamations through May 31, 2016. Absent suspension of section 13247, the State Water Board could not approve a change petition that modifies permits and licenses in a way that does not provide for full attainment of the water quality objectives in the Bay-Delta Plan, even during a drought emergency.

## 4.0 PROCEDURAL REQUIREMENTS CONCERNING THE TEMPORARY URGENCY CHANGE PETITION

The State Water Board may issue a temporary urgency change order in advance of public notice. (Wat. Code, § 1438, subd. (a).) Public notice must be provided as soon as practicable, unless the change will be in effect less than 10 days. (*Id.*, § 1438, subds. (a), (b) & (c).) Any interested person may file an objection to a temporary urgency change. (*Id.*, subd. (d).) The State Water Board must promptly consider and may hold a hearing on any objection. (*Id.*, subd. (e).) State Water Board Resolution 2012-0029 delegates to the Board Members individually and to the Executive Director the authority to hold a hearing, if necessary, and act on a temporary urgency change petition. (Resolution 2012-0029, ¶¶ 2.2, 4.4.1.)[10]

The State Water Board issued a notice of the TUCP and notice of a public workshop on January 27, 2015. In addition to the Board providing public notice of the TUCP, the Petitioners published the notice in 19 newspapers from January 31 to February 5, 2015 in accordance with Water Code section 1438, subdivision (b)(1). Objections to the TUCP were due by February 13, 2015. To date, the State Water Board has received over 70 written submittals including 14 objections and 13 petitions for reconsideration. The workshop on this matter was held on

[10] The Deputy Director for Water Rights may act on a temporary urgency change petition if there are no objections to the petition. (Resolution 2012-0029, ¶ 4.4.1.)

February 18, 2015. At the workshop, the State Water Board received public comment and input on the January 15, 2015 Drought Contingency Plan, the TUCP request, the February 3, 2015 Order taking action on the January 23 Petition, and any potential future change requests. The State Water Board did not take formal action at the workshop.

This Order does not provide written responses to comments and objections due to limited time and the large number of comments and objections received. Written responses will be provided at a later date. Similarly, the State Water Board will take action on the petitions for reconsideration at a later date. Although written responses are not being provided at this time, the comments, objections and petitioners for reconsideration were considered in reaching this decision.

The January 23 Petition, notice of the January 23 Petition and workshop, and supporting information are available via the State Water Board's website at: www.waterboards.ca.gov/waterrights/water_issues/programs/drought/index.shtml.

## 5.0 REQUIRED FINDINGS OF FACT

Water Code section 1435 provides that a permittee or licensee who has an urgent need to change the point of diversion, place of use, or purpose of use from that specified in the permit or license may petition for a conditional temporary change order. The State Water Board's regulations set forth the filing and other procedural requirements applicable to temporary urgency change petitions. (Cal. Code Regs., tit. 23, §§ 805, 806.) The State Water Board's regulations also clarify that requests for changes to permits or licenses other than changes in point of diversion, place of use, or purpose of use may be filed, subject to the same filing and procedural requirements that apply to changes in point of diversion, place of use, or purpose of use. (*Id.*, § 791, subd. (e).)

Before approving a temporary urgency change, the State Water Board must make the following findings:

1. the permittee or licensee has an urgent need to make the proposed change;
2. the proposed change may be made without injury to any other lawful user of water;
3. the proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses; and
4. the proposed change is in the public interest.

(Wat. Code, § 1435, subd. (b)(1-4).)

The State Water Board exercises continuing supervision over temporary urgency change orders and may modify or revoke temporary urgency change orders at any time. (Wat. Code, §§ 1439, 1440.) Temporary urgency change orders expire automatically 180 days after issuance, unless they are revoked or an earlier expiration date is specified. (*Id.*, § 1440.) The State Water Board may renew temporary urgency change orders for a period not to exceed 180 days. (*Id.*, § 1441.)

### 5.1 Summary of the Ordering Conditions that Support the Required Findings of Fact

As summarized and described in the introduction, this Order continues changes from the February 3 Order, approves the intermediate export level requested in the TUCP to a limited extent, clarifies the use of conserved water under the TUCP and the allowance of transfers, and includes other conditions intended to ensure that the changes can be made (1) without injury to

other legal users of water; (2) without unreasonable effects on fish, wildlife, or other instream beneficial uses; and (3) in the public interest.

Specifically, this Order continues the modifications approved in the February 3 Order to: reduce the minimum Delta outflow requirement to 4,000 cfs during February and March; reduce the minimum monthly San Joaquin River flow requirement from 710 or 1,140 cfs to 500 cfs; and allow the DCC Gates to be opened from February through March (to reduce the need for upstream releases to maintain salinity conditions in the interior Delta) in compliance with the DCC Gate Triggers Matrix as described in Appendix G of the April 2014 Drought Operations Plan and Operational Forecast, and in coordination with the State Water Board and fisheries agencies using the consultation process discussed below.

This Order modifies the export limits that were imposed by the February 3 Order when the above modifications are in effect by adding a conditional approval of the intermediate export limit that was previously not approved. Specifically, under this Order exports are limited to 1,500 cfs when Delta outflow is less than 7,100 cfs, or the DCC Gates are open with one exception. An intermediate level of exports, up to 3,500 cfs, is allowed when Delta outflow is between 5,500 cfs and 7,100 cfs and the DCC Gates are closed, to the extent that the Petitioners determine that a higher export rate is necessary to meet the minimum health and safety needs of their contractors. Health and safety needs for the purposes of this Order are defined on page five in the January 15, 2015 Drought Contingency Plan prepared by DWR and USBR. The Order requires that the Petitioners notify the Executive Director before pumping at the intermediate export level and that the Petitioners identify the amount of water that will be exported, where that what will be served and for what purpose. Exports are also allowed in compliance with D-1641 provided that outflows of 7,100 cfs are achieved and the DCC Gates are closed. Any exports higher than 1,500 cfs when all of the D-1641 requirements are not being met are limited to natural and abandoned flows. This Order also clarifies that these export limits do not apply to transfers, but requires that specific information about proposed and actual transfers be provided on a monthly basis so that the effects of thetransfers can be considered and any necessary modifications to the Order can be made in order to ensure that transfers will be consistent with the required findings for the TUCP.

This Order continues the requirement for the Petitioners to consult on a regular basis with designated representatives of the State Water Board and the fisheries agencies to coordinate real-time operations based on current conditions and fisheries information to ensure that the proposed changes pursuant to this Order will not unreasonably affect fish, wildlife, and other instream uses of water. During the effective period of this Order, Petitioners propose to continue to consult with members of an ad hoc team, referred to as the RTDOMT that was established in 2014 to fulfill this requirement.

This Order also includes the condition from the February 3 Order that required DWR and Reclamation calculate and maintain a record of the amount of water conserved through the changes authorized by this Order, as well as to describe where that water is being conserved. This Order modifies the part of the condition that provided that the Executive Director would determine how that water will be used. Instead, this Order provides that DWR and Reclamation shall use the water in accordance with the 2015 Drought Contingency Plan and the Temperature Management Plan for the Sacramento River.

This Order continues the requirement for DWR and Reclamation to develop monthly water balance estimates indicating actual and proposed operations through the end of the water year,

with the addition of actual and proposed transfers discussed above. In addition, this Order continues the requirement for DWR and Reclamation to conduct necessary modeling and monitoring to inform real-time operational decisions and for Reclamation to conduct additional temperature modeling and planning to ensure that temperature control on the Sacramento River for salmonids is maintained throughout the year and that issues encountered last year with temperature control are factored into that planning. This Order changes the due dates for submittal of a report on hindcast modeling for Sacramento River temperature control and the Temperature Management Plan for the Sacramento River, consistent with the Executive Director's approval of a March 4, 2015 USBR request. This Order continues to reserve the Executive Director's authority to require modifications to the Order to protect fish and wildlife or other uses of water based on additional information.

### 5.2 Urgent Need for the Proposed Changes

Under Water Code section 1435, subdivision (c), an "urgent need" means "the existence of circumstances from which the board may in its judgment conclude that the proposed temporary change is necessary to further the constitutional policy that the water resources of the state be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented . . . ."

Relevant to the issue of urgency, as well as the findings regarding unreasonable impacts on fish and wildlife and the public interest, are the water supply benefits that are expected as a result of the changes.[11] Assuming continued dry conditions, the changes to Delta outflows approved in the February 3 Order will result in a reduction in Delta outflows of approximately 56 to 64 TAF through the end of March. This reduction in Delta outflow is estimated to result in savings of 23 to 46 TAF of water in upstream storage and an increase in south of Delta exports of 18 to 33 TAF of natural and abandoned flows during this timeframe that would go to Delta outflow absent the change. The increased storage will be realized in a combination of Shasta, Oroville and Folsom Reservoirs where it can be used for various purposes later in the year, including water supplies for contractors, salinity control and fisheries purposes. The increased exports will benefit south of Delta Project contractors and potentially refuges.

Assuming continued dry conditions, the changes to San Joaquin River flows approved in the February 3 Order will result in a reduction in flows of approximately 26 TAF through the end of March. This reduction in flows is estimated to result in a savings of 26 TAF of water in New Melones Reservoir for various purposes, including agriculture and fisheries purposes in the San Joaquin River watershed later in the year that will mitigate to a limited extent the very low storage conditions in San Joaquin River reservoirs.

Assuming continued dry conditions, the approval of the intermediate export rate of 3,500 cfs when outflows are at least 5,500 cfs made in this Order may increase exports of natural and abandoned flows for health and safety needs by up to approximately 47 TAF to 59 TAF through

[11] Values for water saved under the TUCP are based on DWR's February 25, 2015 predicted Delta inflow recession limb, health and safety exports of 1,500 cfs, and D-1641 critical year requirements. Ranges reflect different assumptions regarding how the D-1641 Table 4 requirements would have been met in the absence of the TUCP. Higher values reflect the assumption that D-1641 March Table 4 requirements would be met primarily through flow while lower values reflect the assumption that D-1641 March Table 4 requirements would be met primarily through salinity.

the end of March. Absent the modifications made in this Order, these flows would go toward helping to achieve required Delta outflows under D-1641 on a one to one basis. These intermediate export amounts are in addition to the exports that were approved in the February 3 Order that allow for continual exports of 1,500 cfs when outflows of 4,000 cfs are achieved and exports up to the D-1641 maximum that are allowed when the Table 4 requirements are not being met but 7,100 cfs outflow or equivalent salinity compliance is being met and the DCC Gates are closed. Together, these export provisions will allow for the Projects to continue to export water for health and safety and other water supply needs when the Projects are not in compliance with D-1641 requirements, which has a significant overall positive effect on Project water supplies south of the Delta and supplies to refuges.

It is difficult to estimate the water supply and storage improvements gained from the modifications to the DCC Gate closure requirements, but they are considered to be potentially significant. It also is not possible to calculate at this time what the improvements to water supplies will be from allowing all transfers to be exempted from the exports constraints established in this Order, but the clarification will remove a potential obstacle to the transfer of thousands of acre-feet of additional water supply to south of Delta water users, which will likely be critical for maintaining supplies to permanent crops and other economically important crops, as well as for other Project uses.

Together, operations to meet unchanged Delta outflow, San Joaquin River flow and DCC Gate closure requirements approved in this Order and the February 3 Order could significantly reduce stored water supplies and opportunities to store additional supplies and reduce opportunities to export water as discussed above, making those supplies unavailable for the remainder of the season, primarily to water supply contractors and prior water right holders, and to some extent for fisheries protection, control of Delta salinity and refuge supplies. Without the changes, the Projects would need to reduce deliveries more than they would with the changes in order to satisfy D-1641 requirements. It is unclear to what extent the changes would benefit storage conditions only for temperature control because there are existing temperature control requirements on the Sacramento and Stanislaus Rivers that might require other actions if the D-1641 Delta outflow and San Joaquin River flow requirements are not modified to improve storage. Further, while conservation and improvements in storage resulting from the changes may benefit temperature control to the extent that existing temperature requirements would not otherwise be met (which is not a given), temperature control is a non-consumptive use and as such the flows released for temperature control are available for diversion by in-basin users, salinity control, or export from the Delta. Accordingly, the primary beneficiaries of the changes will be water users. Reductions in supplies to water users upstream of the Delta would reduce the ability of those water users to provide much needed transfers during the drought, which would adversely affect south of Delta export users and potentially refuges. Reductions in surface water supplies would also place additional strain on already significantly depleted groundwater basins. As such, these changes are considered urgent.

The export allowances were made to mitigate to some extent the significant water supply reductions to municipal, industrial, and agricultural water users that are likely to occur due to the drought. Specifically, the limited approval of the intermediate export rate should ensure that DWR and Reclamation are able to meet the minimum health and safety needs of their contractors. Though this change will not solve the very urgent domestic water supply issues facing many Central Valley communities that do not rely on surface water deliveries from the Projects, it may assist other communities and is thus considered urgent. The exemption of all transfers from the export constraints is also considered urgent as transfers, especially from CVP

and SWP settlement contractors, are a critical source of supply for south of Delta water users and potentially refuges during dry conditions. The identification of proposed transfers in the water balance will allow the Board to consider the effects of the transfers without hindering them. If information indicates that the transfers cannot be implemented consistent with the required findings of this approval, this issue can be revisited.

In summary, the water supply considerations discussed above are considered urgent due to the significant impacts to water supplies that occurred last year and the associated severe economic impacts in some communities, especially given that foregone opportunities to conserve storage for later use cannot be regained.

### 5.3 No Injury to Any Other Lawful User of Water

The proposed changes will not injure any other lawful user of water. As used in Water Code section 1435, the term "injury" means invasion of a legally protected interest. (*State Water Resources Control Board Cases* (2006) 136 Cal.App.4th 674, 738-743.) Riparian and appropriative water right holders with rights to divert water below Project reservoirs only are entitled to divert natural and abandoned flows, and in the case of riparians only natural flows; they are not entitled to divert water previously stored or imported by the Projects that is released for use downstream, including stored water that is released for purposes of meeting water quality objectives. (See *id.* at pp. 738, 743, 771.) Accordingly, other legal users will not be injured to the extent that the Projects release less previously stored water as a result of the changes.

To the extent that the Projects divert natural or abandoned flows during the effective period of this Order, other lawful users will not be injured by the proposed changes because the Projects will continue to meet modified Delta outflow and San Joaquin River flow requirements, and adequate flows are expected to remain in the system to meet the demands of other lawful users of water. Moreover, approval of the proposed changes does not affect the Petitioners' obligation to curtail their diversions of natural and abandoned flows to the extent necessary to protect senior water right holders. Further, this Order requires that the Petitioners' bypass adequate natural and abandoned flows to prevent injury to senior water right holders.

At the present time, DWR and Reclamation have proposed changes to requirements to meet certain water quality objectives established to protect fish and wildlife beneficial uses. DWR and Reclamation have not yet requested any changes to requirements to meet water quality objectives established to protect municipal, industrial, or agricultural beneficial uses. For this reason, the proposed changes will not injure other water users due to a change in water quality. (See *State Water Resources Control Bd. Cases, supra*, at pp. 744-745.)

### 5.4 No Unreasonable Effect upon Fish, Wildlife, or Other Instream Beneficial Uses

As conditioned by this Order, the changes to Delta outflows, export limits, San Joaquin River flows, and DCC Gate closure requirements approved in this Order and the February 3 Order will not unreasonably impact fish, wildlife, or other instream beneficial uses of water. Further, if information indicates that unreasonable impacts are resulting from the changes, the Executive Director and the Board have continuing authority to modify the requirements of this Order. In determining whether the impacts of a change on fish and wildlife would be unreasonable, and whether the change would be in the public interest, the impacts of the change must be weighed against the benefits of the change to all beneficial uses.

The fisheries agencies submitted concurrence letters on January 29 (NOAA) and January 30 (USFWS and DFW) indicating that the changes proposed in the TUCP are in compliance with ESA and CESA requirements. As stated in the introduction to this Order, the concurrence letters submitted by the fisheries agencies support the conclusion that the proposed changes in Project operations will not jeopardize the continued existence of threatened and endangered species, but it does not necessarily follow that the changes will not have an unreasonable effect on fish and wildlife, including species not listed under CESA or ESA that are commercially and recreationally important. Depending on the circumstances, the effect of a change on fish and wildlife may be unreasonable, even if the effect is not likely to cause the extinction of species.

The concurrence letter from NMFS stated that it is difficult to quantify the effects of the TUCP due to uncertainties associated with the specific timing of any action, specific migration timing of any species and uncertainty in the quantitative relationship between the TUCP actions and the response of the species. The letter calls for improved measures to avoid impacts to species. The USFWS and DFW concurrence letters also identified the need to further evaluate evolving scientific information to better understand the effects of the kinds of actions included in the TUCP. These uncertainties will be addressed through continued monitoring and evaluation by the fisheries agencies, and their consultation on a regular basis with DWR and Reclamation, as conditioned by this Order. Furthermore, updated data on the current distribution and status of fish populations (described in more detail below) provides increased confidence in decision-making with regard to these uncertainties. In determining whether the impact of the proposed changes on fish and wildlife is reasonable, the short-term impact to fish and wildlife must be weighed against the long-term impact to all beneficial uses of water if the changes are not approved, including impacts to irrigated agriculture, municipal and industrial use, use by wildlife refuges, stored water needed for downstream temperature control and salinity control in the Delta, and other fish and wildlife uses. Further, the effects that have occurred to the species over several years must be considered. Additional information submitted by the fisheries agencies (on February 26) subsequent to the February 18 workshop summarize how insufficiencies in the quality and quantity of Delta flows have contributed to the decline of the Delta ecosystem. Several processes to ameliorate the effects of these insufficiencies at the state, federal and local levels include development of Biological Opinions, Recovery Plans, Delta Outflow criteria, comprehensive review and update of the Bay-Delta Plan, and drought contingency planning, as well as many other efforts.

As discussed above, low initial storage and historically dry conditions will likely lead to critical water shortages in 2015. Dry conditions during this winter and spring are expected to adversely affect spawning and rearing conditions for delta smelt and longfin smelt, and migration conditions for winter-run Chinook salmon, spring-run Chinook salmon, steelhead trout, and North American green sturgeon. While maintaining the D-1641 Delta outflows and San Joaquin River flow requirements would provide some short-term benefits to these species, the overriding effects of the drought would persist. Further, meeting those requirements would reduce the storage available in Project reservoirs later in the year, primarily for agricultural and other water supply users, as well as potentially for salinity control and cold-water flows for fish.

While the Projects' ability to maintain temperature control for fish and salinity control in the Delta may be improved by the changes approved by this Order, there are existing regulatory requirements that would likely ensure that these minimal requirements are met regardless of the changes. Specifically, Project operators are unlikely to operate Delta facilities, or to be permitted to operate Delta facilities, in a manner that results in salinity intrusion. With respect to temperature control, State Water Board Order WR 90-5 requires Reclamation to operate its

facilities on the Sacramento River to ensure temperature control for salmonids. The NMFS BO also includes temperature requirements on the Sacramento and Stanislaus Rivers. Further, as discussed above, releases for temperature control are non-consumptive and as such are available for downstream water supply and salinity control uses. Accordingly, whether or not the changes conditioned in this Order result in more stored water available for temperature control, the changes will primarily benefit water supplies.

Those water supplies include allocations to senior water right holders and senior water supply contractors on the Sacramento Stanislaus, and San Joaquin Rivers, as well as refuges. As discussed above, increased water supplies available to users upstream of the Delta are also likely to benefit users south of the Delta who engage in transfers, which are expected to occur later this year. Transfer supplies are critically important sources of supply to south of Delta users during dry conditions when there are low to no contract allocations. These transfers help to ensure that permanent crops and other economically important agricultural uses are sustained. Transfers also reduce the reliance on groundwater to some extent. As mentioned previously, groundwater supplies after four years of drought are significantly depleted. Prolonged overdraft of groundwater basins may result in a permanent reduction in the capacity of those storage basins, subsidence, and associated significant infrastructure effects. All of these effects present a significant concern.

In summary, the changes to Delta outflows and San Joaquin River flow requirements approved in this Order balance the various uses of stored water in Project reservoirs over the year by improving water supplies for water allocations, wildlife refuges, and salinity control, and at the same time meeting temperature control requirements. Given the persistent drought conditions and associated impacts that have occurred to groundwater, agriculture, refuges and salmonids, such balancing is reasonable and as such the changes approved in this Order will not have unreasonable effects on fish and wildlife. As mentioned above, this Order requires Reclamation to conduct additional modeling and planning for temperature control (Condition 6) to ensure that any tradeoffs for temperature control will be realized this year. This Order also requires the Projects to provide additional information about actual and planned operations. This information along with fisheries information provided by the fisheries agencies will enable the Executive Director and the Board to monitor the effects of this Order and make changes as necessary to avoid any unreasonable impacts to fish and wildlife or other instream beneficial uses.

With respect to the DCC Gates, the Petitioners propose to open the gates as necessary to reduce intrusion of high salinity water into the Delta while preserving limited storage in upstream reservoirs and reducing impacts to migrating Chinook salmon through use of the DCC Gate triggers and consultation with the RTDOMT. The principal benefit of opening the DCC Gates in February and March is to move more fresh water to the interior Delta, using less storage releases than would be needed to achieve the same salinity with the gates closed. This freshening of the Delta will maintain water quality at the CVP and SWP export pumps and the intakes of Contra Costa Water District that are needed for the protection of public health and safety. With the DCC Gates open, there is potential for decreased survival of Sacramento River-origin species as they move through the central Delta. Potential hazards include increased entrainment, predation, and salvage. These impacts will be reduced by implementing the DCC Gate closure criteria proposed in the TUCP. Further, the tradeoff with maintaining upstream storage will also reduce impacts to other uses as discussed above. The State Water Board concludes that the potential for impairment to instream beneficial uses from this

temporary change is not unreasonable considering the potential impacts to agricultural and municipal water supplies and potentially fish and wildlife that could occur if the temporary change is not approved.

With respect to the export limits, the Petitioners proposed additional export requirements at varying levels of Delta outflow. When the February 3, 2015 Order was approved, fish monitoring data presented in the TUCP and discussed above, indicated that winter-run Chinook salmon, as well as other salmonids, and delta smelt were at an elevated risk of entrainment due to their spatial distribution, abundance, and productivity.

Current monitoring and advice from SWG and DOSS indicates that delta smelt, winter-run and spring-run Chinook, and steelhead continue to experience increased risk of entrainment. One delta smelt was salvaged at the CVP on February 21, 2015, and a substantial increase in wild and hatchery steelhead salvage has occurred at both SWP and CVP facilities since February 16, 2015. Warming temperatures are also likely to initiate migratory behaviors in rearing winter- and spring-run Chinook, leading to greater risk of entrainment.

As discussed above, this Order approves the requested intermediate pumping level of 3,500 cfs when NDOI is at least 5,500 cfs to the extent that the Petitioners determine that an increase in the export rate is necessary to meet the minimum health and safety needs of their contractors. This Order also continues to allow for exports of 1,500 cfs when NDOI is at least 4,000 cfs, regardless of whether the DCC Gates are open, consistent with the February 3 Order. Also consistent with the February 3 Order, this Order continues to allow for exports of natural and abandoned flows above 1,500 cfs consistent with D-1641 export limits when NDOI is at least 7,100 and the DCC Gates are closed. These approvals, except for the conditional approval of the intermediate pumping level, are consistent with export levels approved in 2014, which balanced water supply needs with the need to protect fish and wildlife. While there may be impacts to fish and wildlife from entrainment and associated effects associated with the approved export levels, these changes are reasonable given the extremely limited water supply conditions that water supply contractors and wildlife refuges are likely to face this year and the prolonged depletions of groundwater resources that have occurred associated with the drought.

The intermediate pumping level is reasonable if the Petitioners determine that an increase in exports is needed to satisfy minimum health and safety needs. The TUCP and Biological Reviews state that additional monitoring will be conducted to evaluate the effects of any intermediate exports. It is not clear if this monitoring will be adequate to avoid entrainment and Project pumping impacts given the preferential pumping at the SWP facilities and concerns with the accuracy of entrainment estimates due to the extensive amount of water hyacinth in the vicinity of the export facilities, especially for eggs and larvae. Nonetheless the need to export water for minimal health and safety purposes offsets this uncertainty. Updated water supply information will be evaluated and provided by the Projects continually through the accounting of water on a monthly basis (Condition 3), and estimated water balance estimates (Condition 4). If adequate information is developed to determine that the intermediate pumping level should be discontinued, this Order may be amended to disallow for the intermediate pumping level or to make other modifications.

Based on the above, the State Water Board concludes that the potential for impairment to fish, wildlife, or other instream beneficial uses from the approved temporary changes is not unreasonable considering the impacts to agricultural, municipal and wildlife refuge supplies and fish and wildlife that could occur if the temporary changes are not approved.

### 5.5 The Proposed Change is in the Public Interest

The temporary modifications authorized in this Order will make the best use of limited water supplies and are accordingly in the public interest. As discussed above, hydrologic and water supply conditions in the Sacramento and San Joaquin River basins continue to be highly impacted by the drought and are inadequate to meet all of the demands for water in the basin this year and heading into next year if conditions continue to be dry. To respond to these conditions, the changes in the Order are warranted to reduce to some extent the significant water supply related impacts expected if conditions remain dry. The changes approved in this Order will help conserve stored water so that it can be released throughout 2015 for multiple purposes, including municipal and agricultural supply, wildlife refuge supplies, temperature control on the Sacramento River, fisheries flows on the Stanislaus River and salinity control in the Delta. The changes approved in this Order will also allow for exports for critical purposes. The changes approved in this Order balance the various uses of water now and in the future while preserving water right priorities and protecting the public interest. The Order also continues reporting, consulting, and monitoring requirements and authority to modify the Order to ensure that it remains in the public interest.

## 6.0 CONCLUSIONS

The State Water Board has adequate information in its files for the Executive Director to make the findings required by Water Code section 1435 and to issue modifications to the February 3 Order, as discussed above.

I conclude that, based on the available evidence:

1. The Petitioners have an urgent need to make the proposed changes that are approved by this Order;

2. The approved changes, as conditioned by this Order, will not operate to the injury of any other lawful user of water;

3. The approved changes, as conditioned by this Order, will not have an unreasonable effect upon fish, wildlife, or other instream beneficial uses; and,

4. The approved changes, as conditioned by this Order, are in the public interest.

## ORDER

**NOW, THEREFORE, IT IS ORDERED** the February 3 Order is affirmed, subject to the modifications set forth below. Changes to the February 3 Order are provided in **bold underline** and ~~**bold strikethrough**~~.

**IT IS ORDERED** that the petition for temporary urgency change in permit and license conditions under Permits 16478, 16479, 16481, 16482 and 16483 (Applications 5630, 14443, 14445A, 17512 and 17514A, respectively) of the Department of Water Resources (DWR) for the State Water Project (SWP) and License 1986 and Permits 11315, 11316, 11885, 11886, 11887, 11967, 11968, 11969, 11970, 11971, 11972, 11973, 12364, 12721, 12722, 12723, 12725, 12726, 12727, 12860, 15735, 16597, 20245, and 16600 (Applications 23, 234, 1465, 5638, 13370, 13371, 5628, 15374, 15375, 15376, 16767, 16768, 17374, 17376, 5626, 9363, 9364, 9366, 9367, 9368, 15764, 22316, 14858A, 14858B, and 19304, respectively) of the United States Bureau of Reclamation (Reclamation) for the Central Valley Project (CVP); is approved in part, subject to the following terms and conditions. Except as otherwise provided below, all other terms and conditions of the subject license and permits, including those added by the State Water Resources Control Board (State Water Board) in Revised Decision 1641 (Decision 1641) shall remain in effect. This Order shall be effective from February 4, 2015, until March 31, 2015.

1. Except as otherwise provided in condition 2, below, during February and March of 2015, or until such time as this Order is amended or rescinded, the requirements of Decision 1641 (D-1641) for DWR and Reclamation (or Petitioners) to meet specified water quality objectives are amended as follows:

    a. The minimum Delta outflow levels specified in Table 3 are modified as follows: the minimum Net Delta outflow Index (NDOI) described in Figure 3 of Decision 1641 during the months of February and March shall be no less than 4,000 cubic-feet per second (cfs) on a monthly average. The 7-day running average shall not be less than 1,000 cfs below the monthly average. In addition to base Delta outflows, pursuant to this Order, a higher pulse flow may also be required through the consultation process described in Condition 2 below.

    b. The San Joaquin River Flow requirements at Airport Way Bridge, Vernalis, specified in Table 3 are modified as follows: the minimum flow rate during the months of February and March shall be no less than 500 cfs on a monthly average.

    c. The Delta Cross Channel (DCC) Gate Closure requirements specified in Table 3 are modified as follows: the DCC Gates may be opened during the months of February and March as necessary to preserve limited storage in upstream reservoirs and reduce infiltration of high salinity water into the Delta while reducing impacts to migrating Chinook salmon. Requirements for closure of the DCC Gates during the months of February and March shall be informed and shall be conducted in compliance with the DCC Gate triggers matrix described in Appendix G of the April 2014 Drought Operations Plan and Operational Forecast

and shall be coordinated in accordance with the process described in Condition 2, below.

d. The maximum Export Limits specified in Table 3 are modified as follows:

   **i.** When precipitation and runoff events occur that allow the DCC Gates to be closed and Footnote 10 of Table 3 of D-1641 is being met [3-day average Delta outflow of 7,100 cfs, or electrical conductivity of 2.64 mmhos/cm 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 at the SWP Banks Pumping Plant and the CVP Jones Pumping Plant, subject to other applicable laws and regulations including the federal Endangered Species Act (ESA) and California ESA (CESA).

   **ii.** When NDOI of at least 7,100 cfs is not being met as specified above or the DCC Gates are open, the combined maximum exports at the SWP Banks Pumping Plant and the CVP Jones Pumping Plant shall be no greater than 1,500 cfs **with one exception. To the extent that DWR and Reclamation determine that an increase in the export rate is necessary to meet the minimum public health and safety needs of their contractors, then DWR and Reclamation may export up to a combined 3,500 cfs of natural and abandoned flows, on a 3-day running average, provided that NDOI is greater than 5,500 cfs and the DCC Gates are closed. If DWR and Reclamation make this determination, they must notify the Executive Director of their intent to increase exports prior to exporting water under this provision, the amount of the export increase, where the water will be delivered, and for what purpose. Health and safety needs for the purposes of this Order are defined on page five in the January 15, 2015 Drought Contingency Plan prepared by DWR and USBR.**

   **iii.** During the effective period of this Order, if precipitation events occur that enable DWR and Reclamation to fully comply with the Delta outflow and DCC Gate Closure requirements contained in D-1641, then D-1641 requirements shall be operative, except that any SWP and CVP exports greater than 1,500 cfs shall be limited to natural or abandoned flow, or transfers as specified in condition 1e.

e. These export limitations do not apply to water transfers ~~**under non-SWP or CVP permitted or licensed water rights**~~. Based on additional information or changed circumstances, the export limits imposed pursuant to this Order may be modified through the consultation process described in condition 2, below.

2. DWR and Reclamation shall consult on a regular basis with designated representatives from the State Water Board, Department of Fish and Wildlife, National Marine Fisheries Service and U.S Fish and Wildlife Service (fisheries agencies) concerning current conditions and potential changes to SWP and CVP operations to meet health and safety requirements and to reasonably protect all beneficial uses of water. The Executive Director will designate a representative who will be authorized to make real-time operational decisions to modify

requirements to meet pulse flows associated with the modification to the Delta outflow requirement described above, San Joaquin River flow requirements, DCC Gate closure requirements, Export Limits, and the associated requirements of this Order, including how often DWR and Reclamation need to consult with representatives of the State Water Board and fisheries agencies. If the State Water Board approves any additional temporary urgency changes pursuant to the temporary urgency change petition that is the subject of this Order, or otherwise modifies this Order, the State Water Board will provide notice and an opportunity for interested persons to comment or object. Based on public comments or objections, further changes may be made to this Order. Information concerning changes to this Order will be posted on the State Water Board's website within 24 hours.

3. DWR and Reclamation shall calculate and maintain a record of the amount of water conserved **in storage or exported** through the changes authorized by this Order, as well as a record of where that water was conserved, and shall submit such records on a monthly basis to the State Water Board and fisheries agencies within 20 working days after the first day of the following month. ~~**The use of such water shall be determined by the Executive Director or his representative, taking into consideration input from DWR, Reclamation, the fishery agencies, and other interested persons.**~~ **The water conserved as a result of this approval shall be used in accordance with the Petitioners' 2015 Drought Contingency Plan and Temperature Management Plan for the Sacramento River.**

4. DWR and Reclamation shall develop monthly water balance estimates indicating actual and proposed operations through the end of the water year. Specifically, ~~**actual and projected inflows, north and south of Delta deliveries (contract deliveries and transfers), other channel depletions, exports, and Delta outflows**~~ **the following information** shall be ~~**identified**~~**provided** under at least the 50 percent, 90 percent, and 99 percent hydrologic exceedance scenarios**:**

    a. **Delta: inflows, channel depletions, exports, and outflows;**
    b. **SWP: deliveries to Feather River Service Area contractors, North of Delta Table A contractors, South of Delta Table A contractors;**
    c. **CVP: deliveries to Settlement contractors, American River municipal and industrial (M&I) contractors, Sacramento River agricultural water service contractors, Sacramento River M&I water service contractors, Contra Costa Water District, north of Delta refuges, exchange contractors, south of Delta agricultural water service contractors, south of Delta M&I water service contractors, south of Delta refuges, East side water right holders, New Melones East side, and Friant Unit; and**
    d. **South of Delta water transfers, including the transferors, transferees and the quantities transferred.**

    The water balance shall be posted on DWR's website and updated as necessary based on changed conditions. Monthly updates shall be posted and provided to the State Water Board and fisheries agencies within 20 working days after the first day of the following month.

5. DWR and Reclamation shall conduct necessary modeling and monitoring and prepare other necessary technical information to inform operational decisions. Required modeling and monitoring shall be determined by the Executive Director or his

representative, taking into consideration input from the relevant agencies, including DWR, Reclamation, and the fishery agencies. DWR and Reclamation shall make available, upon request of State Water Board or fisheries agency staff, technical information to inform these operational decisions, including planned operations, temperature models, modeling and monitoring information, water quality modeling and monitoring information, and information about potential impacts of operational changes on other water users and fish and wildlife. DWR and Reclamation shall report to the Board monthly at its Board meetings on their drought operations and the information discussed above beginning with the second February 2015 Board meeting.

6. Pursuant to the requirements of this Order and State Water Board Order WR 90-5, Reclamation, in consultation with the fisheries agencies, shall take the following actions:

    a. Perform hindcast temperature modeling of the water year 2014 temperature control season to verify Reclamation's temperature model accuracy. Model inputs will reflect observed water year 2014 conditions, including, but not limited to, observed air temperatures, inflows, inter-basin transfers, and all other relevant operations. Reclamation will perform further analysis to identify the source of any significant discrepancies between modeled and observed temperatures. Reclamation shall prepare a report comparing the results of the aforementioned hindcast model run(s) to the observed Sacramento River temperatures during the water year 2014 temperature control season. This report will include the full model input and output files used in the hindcast. The report shall be submitted to the State Water Board and Sacramento River Temperature Task Group by March **4~~1~~3**, 2015.

    b. Reclamation, in coordination with the fisheries agencies, shall update the Temperature Management Plan for the Sacramento River for the 2015 winter-run Chinook salmon spawning and rearing period that considers other fisheries needs, including spring- and fall-run Chinook salmon. That plan shall identify and evaluate all available options for reducing temperature and redd dewatering impacts to winter-run Chinook salmon on the Sacramento River for the remainder of the 2015 Water Year. As part of the development of the Temperature Management Plan, Reclamation shall include three temperature model run scenarios: (a) Reclamation's preferred operations, (b) the fisheries agencies' preferred operations and (c) an optimal operation for which temperature control pursuant to Order 90-5 is the primary objective for operations in Water Year 2015 without consideration for contract deliveries and other demands for water from Shasta Reservoir. Reclamation shall follow direction from the fisheries agencies for the assumptions that should be made for model run scenario (b) and shall follow direction from State Water Board staff to determine the assumptions that shall be made for model run scenario (c). The 2015 temperature management plan shall be submitted to the Sacramento River Temperature Task Group (SRTTG) for review no later than March ~~15~~**25**, 2015, with updates as necessary to reflect changing conditions. The final Temperature Management Control Plan shall be submitted to the State Water Board by June 1, 2015. Temperature model input and output files for all scenarios shall be included as an appendix to the Temperature Management Plan.

c. Reclamation shall update the plan as conditions change or upon the request of the fisheries agencies or Executive Director or his designee. Any updates to the Temperature Control Plan shall include updated model results for all three scenarios. For the remainder of the drought, Reclamation shall meet weekly with the SRTTG to discuss operations and options for reducing or avoiding redd dewatering, stranding and temperature impacts to winter-run Chinook salmon. Reclamation shall confer on recommendations from the SRTTG during the consultation process and other applicable CVP and SWP operational decision-making meetings. Reclamation shall immediately make available technical information requested by the Executive Director or his designee through the consultation process. Reclamation shall report monthly to the State Water Board during its Board meeting on actions that have been or will be taken to reduce impacts to winter-run Chinook salmon, through the remainder of the drought.

7. DWR and Reclamation shall bypass natural and abandoned flows to the extent necessary to prevent injury to senior water right holders.

8. This Order may be further modified by the Executive Director or the State Water Board based on additional public input or changed circumstances.

9. This Order does not authorize any act that results in the taking of a candidate, threatened or endangered species, or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). If a "take" will result from any act authorized under this Order, the Petitioners shall obtain authorization for an incidental take permit prior to construction or operation of the project. Petitioners shall be responsible for meeting all requirements of the applicable Endangered Species Act for the temporary urgency changes authorized under this Order.

10. Petitioners shall immediately notify the Executive Director of the State Water Board if any significant change in conditions occurs that warrants reconsideration of this Order.

STATE WATER RESOURCES CONTROL BOARD

ORIGINAL SIGNED BY:

*Thomas Howard*
*Executive Director*
Dated: March 5, 2015