

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

**In the Matter of Specified License and Permits¹ of the
Department of Water Resources and U.S. Bureau of Reclamation
for the State Water Project and Central Valley Project**

**APRIL 6, 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 March 5, 2015 Order (March 5 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) (collectively Petitioners) on January 23, 2015 (January 23 Petition). The January 23 Petition requested changes to the conditions of the Petitioners' water rights for the State Water Project (SWP) and Central Valley Project (CVP) (collectively 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 and agricultural use in the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta). The March 5 Order made several modifications to an order dated February 3, 2015, which approved most of the changes requested by the Petitioners. The February 3 and March 5 Orders 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 measured as electrical conductivity or EC (2.64 millimhos per centimeter (mmhos/cm) at Collinsville), plus the requirement to meet higher flows of 11,400 cfs or 29,200 cfs or equivalent salinity (2.64 mmhos/cm at Chipps Island or Roe Island respectively) for a specified number of days, depending on hydrology, was reduced to a minimum Delta outflow requirement of 4,000 cfs;

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.

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 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.

On March 24, 2015, Petitioners sought additional modifications of the March 5 Order.

This Order considers the requested modifications, extends the changes to Delta outflow and export requirements described above through June, and extends the change to DCC Gate requirements through May 20. In addition, this Order makes the following changes to D-1641 requirements:

1. The time period for the San Joaquin River at Vernalis pulse flow requirement was shifted from April 15 through May 15 to March 25 through April 25 already by the Executive Director. This Order reduces the required volume of the pulse flow during this time period from 3,110 cfs, depending on hydrology, to 710 cfs at Vernalis. In addition, this Order requires Reclamation to comply with the pulse flow requirement contained in the National Marine Fisheries Service's (NMFS) Biological Opinion (BO) and Conference Opinion for the Long-Term Operations of the CVP and SWP.
2. Until May 31, this Order modifies the minimum San Joaquin River flow requirement at Vernalis following the pulse flow period described above from 710 cfs or 1,140 cfs, depending on hydrology, to 300 cfs. In June, this Order reduces the requirement to 200 cfs.
3. This Order modifies the compliance point for the Western Delta agricultural salinity requirement at Emmaton on the Sacramento River to Three-Mile Slough on the Sacramento River from April through June.

This Order does not act on requested changes after June 30 because it is anticipated that a further request will be submitted for additional changes starting in mid-June if conditions continue to be historically dry (trending at the 99 percent hydrologic exceedance level). Further, DWR and Reclamation have not yet submitted a required renewal request for the TUCP that would be needed for changes after August 3.

In 2014, the Executive Director approved the same changes to Delta outflow, Delta export, and DCC Gate requirements, and somewhat similar changes to San Joaquin River flow requirements and the requirement to meet the salinity objective at Emmaton. The changes to San Joaquin River flows allow for lower flows during the pulse flow period relative to what was required last year. However, storage in New Melones is close to half of what it was last year at this time and inflows from other tributaries are expected to be very low. On reconsideration, the State Water Board upheld the approval of the changes that were made through September 2014. (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. In the February 3 Order, the Executive Director denied this request.

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. The February 3 Order did not authorize the use of an additional intermediate export rate, but the March 5 Order further considered and granted 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). The March 5 Order authorized the use of the intermediate export rate under very limited conditions. When Delta outflow was between 5,500 cfs and 7,100 cfs, the DCC Gates were closed, and DWR or Reclamation determined that additional water is necessary to meet minimum public health and safety needs, exports could be increased from 1,500 cfs up to 3,500 cfs, after notifying the Executive Director. In the notification, Petitioners were required to describe the timing and amount of the increase, the beneficiaries of the increase and the purpose of use of the water. In March, Reclamation pumped an additional 6,000 acre-feet of water under the intermediate export level for health and safety purposes in Central Valley communities.

Although opportunities to increase exports under the intermediate rate are likely to be limited, this Order further relaxes the restrictions on the intermediate export rate, in order to afford DWR and Reclamation additional flexibility in the event that future storm events temporarily increase Delta outflows. Specifically, this Order provides that the Executive Director may approve a request to export water at the intermediate rate, provided that Delta outflow is between 5,500 cfs and 7,100 cfs, the DCC Gates are closed, representatives of the fisheries agencies, State Water Board, DWR, and Reclamation agree that the increase in the export rate will not have an unreasonable effect on fish and wildlife. The use of any additional water exported pursuant to this provision may be used for purposes other than public health and safety, so long as the minimum public health and safety needs of DWR's and Reclamation's contractors are met.

In addition to the restrictions on the use of the intermediate export rate, the February 3 and March 5 Orders included other conditions of approval intended to ensure that the approved changes would be in the public interest, and would not injure other legal users of water, or unreasonably affect fish and wildlife. This Order includes the same conditions of approval, with some modifications. Specifically, this Order strengthens the requirement that Reclamation prepare a Temperature Management Plan for the Sacramento River acceptable to the Executive Director in order to ensure that the plan will provide reasonable protection for winter-run Chinook salmon and other salmonids. Last year, 95 percent of the winter-run Chinook salmon run experienced mortality due to elevated water temperatures, despite modeling that indicated that adequate flow and storage conditions would be provided to avoid such temperature impacts. High mortality levels associated with Shasta reservoir operations also occurred to spring-run Chinook salmon and possibly other salmonid runs. Given that winter-run and other salmonid runs have experienced significant impacts from the drought over the last four years and that most of these fish have a 3 to 4 year life-cycle, it is important to ensure their protection this year.

In addition to the measures above, this Order requires that Reclamation develop and implement a plan approved by the Executive Director for operations of New Melones Reservoir that reasonably protects fish and wildlife on the Stanislaus River. Recent information raises significant concerns regarding whether adequate storage conditions will be maintained in New Melones Reservoir in order to reasonably protect fish and wildlife resources this year. Reclamation's March 90 percent exceedance forecast indicates that New Melones storage at the end of the water year (end of September) will be about 132 thousand acre-feet (TAF). However, this appears to be an optimistic estimate given current storage levels (558 TAF), projected contract deliveries (450 TAF), limited expected inflows based on the latest Bulletin 120 update, needed storage to meet TUCP requested flows and biological opinion flows, and

other system losses due to evaporation and seepage. Further, the San Joaquin River basin is tracking closer to a 99 percent exceedance level or worse, which may result in even lower actual storage levels. While there is some uncertainty regarding what would happen at different storage levels, Reclamation staff produced information identifying expected conditions at various storage levels. At storage levels between 225 and 160 TAF, all cold water coming into the reservoir may be trapped behind old Melones Dam, but existing cold water supplies should continue to be available in New Melones. At storage levels between 160 and 95 TAF, there may be no cold water resources available in New Melones. At storage levels between 95 and 87 TAF, old Melones and New Melones are likely disconnected and New Melones water will warm in accordance with air temperatures. At storage levels below 95 TAF there are further significant water quality concerns, including significant temperature and sediment and debris loading issues. It also appears questionable whether water can even be released below storage levels of 87 TAF, or possibly more, because all of the water would be stored behind old Melones Dam where sediment and debris may be blocking the outlet. Of further concern is the issue of when reservoir levels would recover after dropping to such low levels. During the early 1990s drought relatively shortly after New Melones was constructed, storage levels in New Melones dropped below 100 TAF in September of 1992 and did not begin to recover until mid-January of 1993 and still stayed below 1 MAF until March of 1995. Since the early 1990s, sedimentation and debris loading have likely increased as well as demands from New Melones. All of these issues create a significant concern regarding operations of New Melones this year and going into next year.

The February 3 Order, March 5 Order, and this Order are consistent with the legal requirements governing approval of a TUCP. 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, March 5 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 and San Joaquin Rivers 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.

All of the changes approved by this Order are to requirements to meet water quality objectives designed to protect fish and wildlife beneficial uses, with the exception of the change to the requirement to meet the salinity objective at Emmaton, which is designed to protect agricultural beneficial uses. As described in section 5.3 of this Order, the changes to Emmaton salinity as well as the other requirements will not injure any lawful user of water.

As described in section 2.7, estuarine fish populations now are at record low levels and cannot be considered resilient at all. Anadromous salmonid populations have also experienced significant impacts over the past four years associated with the drought. The changes are likely

to have negative effects on these and other fish and wildlife species, but as conditioned by this Order, the effects are not unreasonable under the circumstances. In particular, the importance of Delta outflow to estuarine resource protection is well documented in the Bay-Delta and in estuaries around the world. Adequate instream flows are also important to salmonids to provide appropriate habitat conditions, including temperatures and dissolved oxygen levels. The changes approved in this Order will reduce Delta outflows (and the associated river flows that provide these outflows) and San Joaquin River flows to the detriment of fish and wildlife. The opening of the Delta Cross Channel Gates and export operations with reduced outflows and river flows will also potentially increase impacts to fishery resources.

To limit the effects of changes approved in this Order on fish and wildlife, and to ensure that any effects are not unreasonable, this Order requires that actions be taken on the Sacramento and Stanislaus Rivers to protect against temperature and related impacts for the remainder of the water year going into next year. In addition, this order limits the use of the intermediate export rate to times when it can be determined that it would not have unreasonable impacts to fish and wildlife.

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 January through March time period in particular is the driest on record. The drought is having devastating effects on communities, farmers, farm workers, the fishing industry, and the environment, and has caused substantial human suffering.

In the face of this drought, the California Department of Fish and Wildlife (CDFW), NMFS, United States Fish and Wildlife Service (USFWS) (collectively fisheries agencies), and the State Water Board have coordinated with DWR and Reclamation to allow a number of adjustments to Endangered Species Act (ESA) 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 and March 5 Orders, 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. Similarly, this Order approves most of what was requested by the Petitioners for the April through June period. Assuming continued dry conditions, the changes approved in this order will significantly reduce flows in favor of improved water supplies and reservoir storage levels. The potential water supply and storage improvements from the changes approved by this Order and the February 3 and March 5 Orders total more than 1.2 million acre-feet (MAF) of water. In granting similar requests last year, more than 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.

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.

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 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 (Chippis 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 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

²D-1641 originally implemented the 1995 Bay-Delta Plan. In 2006, the State Water Board amended the Bay-Delta Plan to allow for staged implementation of pulse flow objectives consistent with D-1641.

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 mmhos/cm (Collinsville station C2). The standard does not apply in May and June if the best available May estimate of the Sacramento River Index for the water year is less than 8.1 MAF at the 90 percent exceedance level. Under this circumstance, a minimum 14-day running average flow of 4,000 cfs is required in May and June. 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 Eight River Index for March was 801 TAF. Based on this Eight River Index, there are no additional Table 4 requirements during April.

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.

³Pursuant 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 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.

Per Table 3, the San Joaquin River flow requirement for April 1 to April 14 and from May 16 to June 30 is 710 cfs or 1,140 cfs. Additionally a pulse flow of 3,110 cfs or 3,540 cfs is required during critically dry years. The default time period for the pulse flow requirements is April 15 to May 15. The time period for the pulse flow may be varied based on real-time monitoring to coincide with fish migration in the San Joaquin River tributaries and the Delta under consultation with the USFWS, the NMFS and the CDFW. This year, the time period for the pulse flows was modified to start on March 25 to promote early migration of salmonids out of the San Joaquin River before temperatures are too high. This change in timing was done in coordination with the proposed changes to the pulse flow volume considered in this order.

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-1641 and 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.

Export Limits

The export limits objective listed in Table 3 of the Bay-Delta Plan and D-1641 include 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. During the April 15 to May 15 San Joaquin River pulse flow period, the maximum export rate is 1,500 cfs or 100 percent of the 3-day running average of San Joaquin River flow at Vernalis, whichever is greater. Variations to this maximum export rate, including timing, may be authorized if agreed to by the USFWS, the NMFS and the CDFW. This year the timing of the export limits during the San Joaquin River pulse flow period was modified to coincide with the pulse flows and apply from March 25 through April 25.

Western Delta Salinity at Emmaton

The western Delta salinity requirements are listed in Table 2 of the Bay-Delta Plan and D-1641 and include two compliance locations, including one on the Sacramento River at Emmaton for which a requested change was made. The salinity requirement is intended to provide protection of agricultural uses in the western Delta from salinity intrusion. For the April 1 to August 15 period in critically dry years the maximum 14-day running average of mean daily EC is 2.78 mmhos/cm.

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 March 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), Central Section (Carson, Yuba, American, Mokelumne, Stanislaus, Tuolumne, Merced and Walker River watersheds), and Northern Section snowpack (Trinity, Eel, Sacramento, Feather, and Truckee River watersheds) were all 5 percent of average on April 1, 2015. This historically low snow pack will result in very low inflows the remainder of the year that typically maintain stream flows over the summer and provide inflows to reservoirs. Without additional significant precipitation, inflows for the remainder of the year will likely be amongst the lowest on record, especially given that January through March was the driest on record for much of the state.

In the Sacramento River watershed, Water Year 2012 was classified as below normal, Water Year 2013 was dry, Water Year 2014 was critically dry, and 2015 may also be critically dry. Historically, January, February, and March the wettest months of the year. As of April 1, 2015, however, the Northern Sierra [8-Station Precipitation Index](#) was at 31.7 inches, 76 percent of average for this time of year, 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 most of February and March. While a 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 59, 51 and 58 percent of capacity, respectively, on March 31, 2015 (73, 66, and 91 percent of average for March, respectively). Trinity Lake (water from the Trinity system is transferred to the Sacramento River system) on the Trinity River is at 49 percent of capacity and 62 percent of the February average. These low storage levels are of particular concern given the very low inflows that will likely occur without significant additional precipitation this spring.

The San Joaquin River Watershed in particular has experienced severely dry conditions for the past four years. Water Year 2012 was classified as dry and Water Years 2013 and 2014 as critically dry. 2015 will also likely be critically dry. As of April 1, 2015, the San Joaquin Valley [5-Station Index](#) is at 13.7 inches, 41 percent of average for this time of year. The lack of precipitation in the last few years has contributed to historically 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 9, 44, 23 and 39 percent of capacity, respectively (16, 60, 37, and 56 percent of average for February, respectively). The lack of inflow through the rest of the year as a result of reduced snow pack will be an even greater concern in the San Joaquin River watershed.

The 2014 and 2015 End-of-March storage amounts in the major SWP and CVP reservoirs are shown in the table below.

Reservoir	March 2014 EOM	March 2015 EOM	Change in Storage
Trinity (CVP)	1,307	1,190	-117
Shasta (CVP)	2,199	2,689	+490
Oroville (SWP)	1,716	1,794	+78
Folsom (CVP)	436	571	+135
New Melones (CVP)	1,037	553	-484
San Luis (CVP)	468	395	-73
San Luis (SWP)	389	958	+569
Millerton (CVP)	168	204	+36
Total	7,720	8,354	+634

Current storage in Shasta, Oroville, Folsom, and Millerton reservoirs is slightly greater than in March 2014, but as discussed above remains low compared to long term historical conditions. Further, there will likely be very limited inflows this summer and fall unless there is significantly more precipitation this spring. Storage in Trinity and New Melones reservoirs is lower than in March 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 with both the Sacramento and San Joaquin River watersheds trending toward the 99 percent hydrologic exceedance level or worse.

To complicate the storage issue in 2015, some of the reservoirs have physical characteristics which limit the control of cold water released for fish and wildlife beneficial uses. For example, in 1992 New Melones Reservoir storage dropped to an elevation low enough that the release inlet had to be switched from the high elevation release inlet to the low elevation release inlet, and Old Melones Dam was also exposed adjacent to New Melones Dam. When this combination of events happened from approximately June through October in 1992, the reservoir releases went through dramatic and concerning swings in temperature and sediment releases. There is concern that New Melones storage in 2015 will go through a similar series of events if storage drops below 225 TAF as described in the introduction. In 2014 Shasta and Keswick dams also lost control of the ability to release cold water for fish and wildlife beneficial uses on the Sacramento River. The effects of limited cold water storage and loss of temperature control out of Shasta and Keswick dams from mid-August through the fall of 2014 led to substantial egg and fry mortality.

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, including south of Delta, from that runoff. However, given recent extreme dry conditions, these amounts may change further along with the current estimate to deliver 100 percent of requests to DWR's Feather River settlement contractors. 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. On March 27, 2015, Reclamation confirmed these allocations along with allocations of 75 percent to settlement and exchange contractors and refuges.

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 proclaimed a State of Emergency due to severe drought conditions and directed the State Water Board, among other things, to consider modifying requirements for reservoir releases or diversion limitations that were established to implement a water quality control plan. Such modifications, which could be accomplished through actions on requests such as the TUCP, would enable water to be conserved in upstream reservoirs that may be needed later in the year to protect cold water pools for salmon and steelhead, to maintain water supplies, and to improve water quality. To carry out this directive, Governor Brown also suspended the California Environmental Quality Act (CEQA), the CEQA regulations,

and Water Code section 13247 (requiring state agencies, including the State Water Board, to comply with water quality control plans unless otherwise directed or authorized by statute).

The directive applicable to the State Water Board's action on the Petitioners' request and suspensions of law remain in effect. On April 25, 2014, the Governor issued a Proclamation of a Continued State of Emergency providing that the provisions of the January 17, 2014 Proclamation remain in full force and effect and also adding 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. Most recently, on April 1, 2015, Governor Brown acknowledged the continuing magnitude of the drought and issued Executive Order B-29-15, which requires the orders and provisions of the prior proclamations and executive orders to remain in full force and effect unless otherwise modified. The provisions of the January 2014 Proclamation that apply to this action are still in effect.

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 the State Water Board denied the petitions for reconsideration in Order WR 2014-0029, it 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 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.

2.5 Substance of the Temporary, Urgency Change Petition

As summarized in the introduction to this Order, the March 24 TUCP requests 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

request these temporary changes in April, May, June, July and August, and 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 request the following temporary changes to requirements that were imposed pursuant to D-1641:

- The Petitioners request modification of the minimum monthly NDOI during April, May, June to be no less than 4,000 cfs and during July to be no less than 3,000 cfs.
- The Petitioners request a minimum monthly San Joaquin River flow during the 31-day pulse flow period of 710 cfs, for the period following the 31-day pulse flow through May 31 to be 300 cfs, and for the month of June to be 200 cfs.
- The Petitioners request modification of the DCC Gate closure requirements to allow the DCC Gates to be opened during April through May 20⁴ 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).
- The Petitioners propose 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

⁴ State Water Board staff confirmed with DWR staff that the request for modification of the DCC Gate close requirements is through May 20, 2015, and does not include the May 21 through June 15 time period.

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 the California Endangered Species Act (CESA).

- The Petitioners request modification to the Sacramento River flow requirements at Rio Vista for September to be no less than 2,500 cfs. This change cannot be considered at this time because it is for changes after the expiration date of the current TUCP. This request may be considered after a request to renew the TUCP is received.
- The Petitioners request modification of the western Delta agricultural salinity compliance location from Emmaton to Threemile Slough through August 15.
- The Petitioners request modification of the EC requirement on the San Joaquin River at Vernalis for the protection of agricultural beneficial uses. The Petitioners request that the requirement be modified from 0.7 mmhos/cm to 1.0 mmhos/cm EC . This change is not being considered as part of this Order because information has not yet been provided to support the finding that the change will not impact other legal users of water. Once that information is provided, this change may be considered.
- Additional potential future requests for changes under a continued 99 percent hydrologic exceedance level are described in the January 15, 2015 Drought Contingency Plan and referenced in the TUCP. The State Water Board has not yet received a request for those additional changes. Such potential future requests to modify D-1641 requirements include: (1) additional requests to modify Delta outflows during the months of June through October, (2) additional requests to change the Western Delta agriculture salinity objective, (3) additional requests to modify the Sacramento River flow requirements at Rio Vista during September, October and November, and (4) requests to modify the Suisun Marsh salinity requirements beginning in May. Because the current hydrology is tracking the 99 percent hydrology, this Order does not consider changes beyond June because it is likely that the requests for July on will be modified.

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 to protect aquatic species, water quality and water supplies.

2.6 Previous 2015 Orders

February 3, 2015 Order

On February 3, 2015, the Executive Director issued an order that took action on the January 23, 2015 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 were not being met, the maximum rate of export from the Delta was limited to: (a) 1,500 cfs when Delta outflow was 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 were closed and Delta outflow was above 7,100 cfs but the additional requirements included in Table 4 were not being met except that those diversions were 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 was at least 5,500 cfs.

March 5, 2015 Order

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 were used to inform the March 5, 2015 update to the February 3 Order. The March 5, 2015 Order modified the February 3 Order by specifying that:

1. Petitioners should use the conserved water pursuant to the TUCP in accordance with their 2015 Drought Contingency Plan and Temperature Management Plan for the Sacramento River.
2. Water transfers were exempted from the export provisions; and
3. The intermediate export rate of 3,500 cfs was approved when Delta outflow was between 5,500 cfs and 7,100 cfs, the DCC Gates were closed, and DWR or Reclamation determined that additional water was necessary to meet minimum public health and safety needs after notifying the Executive Director.

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 a review as an attachment to their March 24 TUCP, entitled “Biological Review for Endangered Species Act Compliance with the WY 2015 Drought Contingency Plan April through September Project Description” (Biological Review) 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 most recent Biological Review accompanying the March 24 TUCP and information from more recent monitoring...

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),⁵ which began

⁵ 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

in 1967, and the first three surveys of the Spring Kodiak Trawl (SKT).⁶ The third SKT survey conducted in March only caught 6 total individuals. Since the SKT targets delta smelt, the typical monthly survey captures between fifty and two hundred individuals. This low catch has only occurred over the period of record at this level once before in May surveys, when catches typically tail off because of post-spawn mortality. 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, only 10 percent of delta smelt captured in SKT surveys to date have been found in the Cache Slough and Liberty Island complex and Sacramento Deep Water Ship Channel (SDWSC; n=10 in the first three SKT surveys). In prior years, larger fractions of the population have typically been found in these locations, which have been considered a spatial refuge for delta smelt from the effects of entrainment and the Project pumping facilities. However, the distribution of adult delta smelt caught in recent surveys has been largely outside the influence of the export facilities.

Larval sampling (Smelt Larva Survey⁷, SLS, and 20mm Survey⁸, combined) has detected two larval delta smelt in the Cache Slough complex, two in the lower Sacramento River, and three in Old River. According to particle tracking model (PTM) runs in the Biological Review, larval delta smelt in Old River and other central and southern Delta locations will be vulnerable to entrainment under the baseline scenario and more vulnerable under the modified hydrological scenarios. This is of concern because a large fraction of larval delta smelt captured to date have been found in Old River, and early warning sampling of adults suggests that more larvae may hatch in the central and southern Delta in coming weeks. However, the Smelt Working Group (SWG; March 30 notes)⁹ indicates that the 20mm Survey reflects larval delta smelt distribution more reliably than the SLS gear, so information from the former survey will be critical during the period covered by this order. The estimated cumulative season total for adult delta smelt salvage is 68. No salvage has been reported since February 21. The SWP and CVP initiated larval fish monitoring on March 2nd and February 24th, respectively. The frequency of larval fish samples at the CVP has been reduced at times due to heavy debris load in the salvage collections. Regardless, no larval Delta Smelt have been reported at either facility to date. However, pre-screen loss of all life stages (e.g., predation) may decouple entrainment at low densities so that fish entrained at low densities are not observed in salvage. Capture of adult delta smelt in Early Warning Surveys¹⁰ has declined, with a single adult delta smelt most

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.

⁶The 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.

⁷The SLS, initiated in January 2009, provides near real-time distribution data for longfin and delta smelt larvae in the Delta, Suisun Bay and Suisun Marsh. These data are used by agency managers to assess vulnerability of longfin smelt larvae to entrainment in south Delta export pumps.

⁸The 20mm Survey, initiated in April, 1995, monitors postlarval-juvenile delta smelt distribution and relative abundance throughout their historical spring range in the Sacramento-San Joaquin Delta and San Francisco Estuary.

⁹The 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.

¹⁰Additional surveys with the intent to inform USFWS and others, whether, during weather events and freshets, substantial numbers of delta smelt are moved, or being moved, into areas potentially subject to entrainment. Sampling effort was reduced from daily to weekly surveys in early March.

recently captured at Jersey Point on March 23. No delta smelt have been caught at Prisoners Point since February 15.

Poor conditions from the drought can impact Delta Smelt in a variety of ways. The area of low salinity habitat to which delta smelt migrate for spawning can be reduced which lessens food availability for adults and migrating juveniles. Warming temperatures shortens the spawning window, which causes fewer clutches to be produced per female and impacts the reproductive potential. These mechanisms combine with low adult abundance to impair population fecundity.

According to the most recent Biological review, the proposed changes to D-1641 may increase entrainment risk for delta smelt moving around in the central and southern Delta and the San Joaquin River. For the confluence, as described above, and indicated by forecasted daily EC results, salinity is expected to shift the centroid of the population distribution associated with X2 inland. This will expose larvae and juveniles to higher predation rates, greater contaminant effects, losses in irrigation diversions, water temperatures stress, and generally poorer physical habitat.

Following is a summary from the Biological Review of the potential effects of the TUCP on delta smelt.

Delta Smelt	Life stage Affected	Change in Risk of Lowered Recruitment	Change in Risk of Entrainment at Facilities	Certainty
Eggs	Attached to substrate with very low risk of entrainment			
Larvae	Presence has been established based on Smelt Larva Survey #5 and 20 mm Survey #1. This life stage has not yet recruited to most sampling gear			
Juvenile	Juvenile Delta Smelt (>20mm) have not yet been detected this year			
Adults	Distribution based on February 2015 Spring Kodiak Trawl survey and salvage at SWP/CVP export facilities			
No detections in South Delta	Yes	Not Applicable	Reduced	Moderate
Present in San Joaquin River	Yes	Not Applicable	Reduced	Moderate
Present in Sacramento River	No	Not Applicable	Not Affected	Moderate
Present in Confluence and down	No	Not Applicable	Not Affected	High

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. San Francisco Bay Study (Bay Study)¹¹ trawls have detected adult longfin smelt primarily in

¹¹ The San Francisco Bay Study (Bay Study) was established in 1980 to determine the effects of freshwater outflow on the abundance and distribution of fish and mobile crustaceans in the San Francisco Estuary, primarily downstream of the Sacramento-San Joaquin Delta.

Suisun Bay, the confluence, and the lower Sacramento. To date, no adult longfin smelt have been salvaged in water year 2015, but they were detected in Early Warning Surveys at Jersey Point in January. This presence suggested that larval longfin smelt would be present in the central and southern Delta later in the season. This has been corroborated by catch of larval longfin smelt in the central and southern delta during the fifth and sixth SLS, detection of small numbers of larvae at both SWP and CVP facilities during February and March, and salvage of juveniles at CVP facilities on March 26 and 29. The majority of the larval longfin smelt population remains in the confluence and lower Sacramento River, but based on a comparison of the fifth and sixth SLS, the centroid of the larval longfin smelt distribution has moved upstream.

The Biological Review estimated the effect of the proposed decreases in Delta outflow on longfin smelt using PTM results. The results indicate it is likely the proposed changes will exacerbate poor longfin smelt recruitment and survival already expected in 2015 due to the severity of the drought. Furthermore, it is likely that longfin smelt larvae in the San Joaquin River (Prisoner’s Point and upstream) and in the south Delta will have a somewhat increased risk of entrainment into the south Delta as part of the requested changes.

According to the Biological Review, longfin smelt are likely to experience poor recruitment this year due to effects of the continuing drought. Low spawning and larval detection rates this year seem to verify these low survival rates. The reduction of Delta outflow due to the proposed changes will likely have some negative impact on longfin spawning and recruitment, though the strength of this effect is uncertain when considering the drought conditions.

Following is a summary from the Biological Review of the potential effects of the TUCP on longfin smelt.

Longfin Smelt	Life stage Affected	Change in Risk of Lowered Recruitment	Change in Risk of Entrainment at Facilities	Certainty
Eggs	Attached to substrate with very low risk of entrainment			
Larvae	Distribution based on Smelt Larva Survey #5			
~1% South Delta	Yes	Increased	Increased	High
~11% San Joaquin River	Yes	Increased	No Change	Moderate
~22% Sacramento River	Yes	Increased	No Change	Moderate
~66% Confluence and Suisun	Yes	Increased	No Change	Moderate
Juvenile	Juvenile Longfin (>20mm) have not yet been detected this year			
Adults	Distribution based on February 2015 Bay Study survey			
0% South Delta	Not Applicable	Not Applicable	Not Applicable	Moderate
0% San Joaquin River	Not Applicable	Not Applicable	Not Applicable	Moderate
<5% Sacramento River	No	Not Affected	Not Affected	Moderate
95% Confluence, Suisun & SF Bay	No	Not Affected	Not Affected	High

Estuarine Habitat and Species

The Biological Review focused on species listed under ESA and CESA, but the proposed action is also likely to have adverse effects on other beneficial uses protected by D-1641. In particular, the Delta outflow objectives in Tables 3 and 4 of D-1641 protect estuarine habitat and several species of pelagic fish and crustaceans whose populations show strong positive relationships to Delta outflow. Although most of these species are not afforded the protections of ESA or CESA, many have undergone population declines over the history of water development in the Bay-Delta. As discussed above for longfin smelt, decreasing Delta outflow moves low salinity zone habitat inland from the shallow, more favorable habitats of Suisun Bay to the deeper, channelized, and less hospitable habitats of the lower Sacramento and San Joaquin Rivers and their confluence. This reduction in low salinity zone habitat quantity and quality will likely result in lower recruitment of several estuarine-dependent species.

Winter-Run Chinook Salmon

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 Fahrenheit throughout the 2014 temperature control season at the designated Clear Creek temperature compliance location 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 when each of the existing brood years has been affected by drought already.

Monitoring data throughout the Sacramento River suggest that the majority of juvenile salmonids, including natural-origin winter-run Chinook salmon are currently residing in the Lower Sacramento River and Delta. According to the Delta Operations for Salmonids and Sturgeon team (DOSS)¹², as of March 17 greater than 85 percent of the natural origin winter-run juveniles were rearing in the Delta, less than 15 percent had exited the Delta, and few remaining stragglers had yet to enter the Delta. Additionally, 70 to 85 percent of hatchery winter-run Chinook salmon have entered the Delta. During April and May, the seaward migration of juvenile winter-run is likely to be completed. 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 (with temperatures above 56 degrees being less than optimal). 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

¹² Delta Operations for Salmonids and Sturgeon (DOSS) is a technical advisory team that provides recommendations to WOMET 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.

replacement rate (CRR)¹³ estimates, BY 2012 had the fifth lowest CRR since 1992, making this run of particular concern.

With respect to the effects of the changes on the Sacramento River, the Biological Review defers to the Sacramento River Temperature Management Plan required by State Water Board Order WR 90-5 and the March 5, 2015 TUCP Order. The March 90 percent forecast for Shasta Reservoir shows storage levels slightly higher than last year at the end of September. These storage levels are an indicator of the resources available to control temperatures throughout the year. Initial temperature modeling indicates that this storage level would mostly meet a 56 degree Fahrenheit temperature target at the Clear Creek compliance location. However, the current hydrology is tracking much drier than the 90 percent hydrologic exceedance level. Further, based on last year's experience, the Sacramento River temperature model may under-predict elevated temperatures, particularly later in the season with the projected low storage levels. As a result, the State Water Board is continuing to work with Reclamation and the fisheries agencies on this matter to develop proposed operations that will reasonably protect winter-run and other fish species this year.

With respect to the proposed changes on winter-run in the Delta, the biological review finds that the proposed reductions in Delta outflows and associated reductions in Sacramento River flows may reduce through-Delta survival of migrating juvenile winter-run by increasing the time it takes for juveniles to leave the Delta, which may increase the potential for predation. Also, at low outflows, channel margin habitat becomes exposed above the surface of the water and is unavailable to juvenile salmonids. This lack of cover may reduce juvenile survival. It is hypothesized that lower outflows may also intensify the density of predators into a smaller, shallower area and decrease the quantity of cover available to outmigrating salmonids to avoid predators.

The biological review also finds that the decreased outflows will lead to increased tidal excursions which may increase juvenile entrainment into Georgiana Slough and, if open, the DCC Gates. However, at this time, it is believed that an open DCC Gate has a low potential for entraining a substantial proportion of the juvenile winter-run population because a majority of the juveniles are believed to already be in the Delta and past the DCC gate location. The remaining fraction of the natural and hatchery winter-run juvenile population that may still occur above the DCC Gate location will be vulnerable to entrainment into an open DCC Gate as they emigrate downriver past the DCC Gate location but these effects are expected to be limited because most fish should pass the DCC Gates by mid-April and exports will be relatively low. Opening the DCC gates may also affect adult winter-run by causing straying into the Mokelumne River system which may delay migration to the Sacramento River spawning grounds which may affect reproductive success.

With respect to exports, the Biological Review finds that the changes are expected to result in minimal additional entrainment risk because exports are expected to be low and the majority of juvenile winter-run will have exited the system shortly. Because the export rates will be limited to 1,500 cfs or 100 percent of the San Joaquin River flow pursuant to D-1641 until April 25 (the TUCP did not request a modification in this requirement), it is likely that exports will not increase

¹³ 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.

substantially unless there is a significant storm event. While salvage of juveniles is projected to remain moderate if exports increase in April and May, the Projects plan to shift exports from the SWP to the CVP in order to reduce the risks associated with entrainment loss in this event.

Following is a summary from the Biological Review of the potential effects of the TUCP on winter-run Chinook salmon.

Winter-run Chinook Salmon Life Stage	Life Stage Present	Tributary Habitat Effect	South/Central Delta Entrainment Effect	Facility Loss Effect
Egg/Alevin	This life stage will be present in the Sacramento River May through September for BY 15.			
Sacramento R	Yes	Yes ^o	N/A	N/A
Juvenile	This life stage will be present in the Delta during April and May for BY 14 and in the Sacramento during August to September for BY 15.			
Sacramento R	Yes	Reduced Survival	N/A	N/A
Delta	Yes	N/A	Yes	Uncertain
Adults	This life stage will be present in the Sacramento River and Delta during April through July			
Sacramento R	Yes	No Change	N/A	N/A
Delta	Yes	N/A	N/A	N/A

Spring-run Chinook Salmon

The 2014 spawning run of spring-run Chinook salmon returning to the upper Sacramento River system 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. The run was lower in four of seven locations compared to the 2013 escapement,¹⁴ 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 Keswick Dam starting in early September 2014 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. As of March 17, DOSS estimates that the majority (80-95 percent) of natural-origin spring-run are rearing in the Delta, 5-20 percent remain upstream of the Delta, and less than 5 percent have exited the Delta. Adult spring-run will be entering the upper Sacramento River and Clear Creek during spring and continue into

¹⁴ Escapement refers to that portion of an anadromous fish population that returns from the ocean and reaches the freshwater spawning grounds.

the summer of 2015, then holding until they start spawning in mid-August, with peak spawning occurring in September and completing by mid-October.

With respect to effects of the changes on the Sacramento River and Clear Creek, the Biological Review defers to the Sacramento River Temperature Management Plan. The same issues described for winter-run apply to spring run given the similar needs for temperature control through mid-October. With respect to Delta conditions resulting from the change, effects of opening the DCC Gates, and export operations, the biological review describes similar effects as described for winter-run.

Following is a summary from the Biological Review of the potential effects of the TUCP on spring-run Chinook salmon.

Spring-run Chinook Salmon Life Stage	Life Stage Present	Tributary Habitat Effect	South/Central Delta Entrainment Effect	Facility Loss Effect
Egg		This life stage will be present in the Sacramento River in September		
Sacramento R	Yes	Yes	N/A	N/A
Clear Creek	Yes	Yes	N/A	N/A
Juvenile		This life stage will be present in the Sacramento River and Delta during April and May		
Sacramento R	Yes	Reduced Survival	N/A	N/A
Clear Creek	Yes	No Modification in Project	N/A	N/A
Delta	Yes	N/A	Increased	Uncertain
Adults		This life stage will be present in the Sacramento River and Delta during April through September		
Sacramento R	Yes	No Change	N/A	N/A
Delta	Yes	N/A	No Change	No Change

Steelhead

Steelhead 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. Adult steelhead abundance is not estimated in the mainstem of the Sacramento River or any waterways of the Central Valley. For juveniles a low to moderate level of salvage of natural- and hatchery-origin has occurred this winter, with a cumulative loss of 95 natural-origin and 1,754 hatchery-origin juveniles as of March 15. Based on recoveries in the Stanislaus River at the Caswell and Oakdale rotary screw traps, 50 percent of steelhead have emigrated by March 4, and 76 percent of smolts have exited the Stanislaus River by the end of March. Additionally, as of March 9, 36 adipose-clipped steelhead and no unmarked steelhead have been recovered in various beach seine and trawling efforts in the Delta and Lower San Joaquin River.

According to the Biological Review, the drought conditions are causing increased stress to steelhead populations (with or without water project operations) from low flows causing reduced rearing and migratory habitat, increased water temperatures affecting survival, and likely higher than normal predation on juvenile steelhead. The changes proposed in the TUCP will add to some degree to these effects, but the conservation of storage will also mitigate these effects to some extent. Steelhead survival will be low in all tributaries and migratory pathways, and is likely to result in a smaller returning year class of steelhead emigrating this year.

Following is a summary from the Biological Review of the potential effects of the TUCP on steelhead.

Steelhead Life Stage	Life Stage Present	Tributary Habitat Effect	South/Central Delta Entrainment Effect	Facility Loss Effect
Egg	This life stage will be present in the Sacramento River and tributaries April through May			
Sacramento R and tributaries	Yes	Yes	No	N/A
San Joaquin R and Stanislaus R	Yes	Yes	No	N/A
Juvenile	This life stage will be present in the Sacramento River, San Joaquin River and Delta during April through September			
Sacramento R and tributaries	Yes	Potentially reduced survival	N/A	N/A
San Joaquin R and Stanislaus R	Yes	Potentially reduced survival	N/A	N/A
Delta (Sac River side)	Yes	N/A	Increased	Uncertain
Delta (SJR side)	Yes	N/A	Increased	Increased
Adults	This life stage will be present in the Sacramento and San Joaquin Rivers and Delta during April-May and August-September			
Sacramento R and tributaries	Yes	No Change	No Change	No Change
San Joaquin R and Stanislaus R	Yes	No Change	No Change	No Change
Delta	Yes	No Change	No Change	No Change

Fall-Run Chinook Salmon

Impacts to other anadromous species not addressed in the Biological Review, including commercially important fall-run Chinook salmon 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.

Central Valley fall-run Chinook salmon typically migrate into natal rivers from September to December, with peak migration typically occurring in November. Fall-run Chinook salmon typically begin spawning between November and January when temperatures in the rivers are lower than 55 degrees Fahrenheit. Egg incubation typically occurs between November and March, lasting 40–60 days, but can vary depending on water temperatures and timing of spawning. Optimal water temperatures for egg incubation range from 41 to 55 degrees Fahrenheit. Eggs that incubate at temperatures higher than 60 degrees and lower than 38 degrees Fahrenheit suffer high mortality rates. Newly hatched salmon (alevins) remain in the gravel for about 4–6 weeks, depending on surrounding water temperatures, until the yolk sac has been absorbed. Generally, alevins suffer low mortality when consistently incubated at water temperatures between 50 and 55 degrees Fahrenheit. However, if incubated at constant temperatures between 55 and 57.5 degrees Fahrenheit, mortality at the alevin stage has been shown to increase significantly. Most fall-run Chinook salmon fry emerge from the gravel between February and March and are immediately dispersed into downstream feeding areas. However, many juveniles may rear in the river for some length of time before migrating downstream. Rearing and outmigration of fall-run Chinook salmon typically occurs between February and June; with peaks in fry outmigration occurring in February and March, and peaks in smolt (>75 mm) outmigration occur in April and May.

Fall-run Chinook salmon have likely been affected by the drought and water operations during the drought. Relaxations of fish and wildlife flow requirements during the spring time period are likely to impact rearing and migration juvenile fall-run Chinook salmon. In addition, projected end of September storage conditions may impact fall-run Chinook salmon reproduction during the end of 2015 because of a lack of cold water pool availability. Therefore this year's drought conditions will affect two cohorts of fall-run Chinook salmon. Not minimizing drought and water operation impacts during 2015 could lead to an extremely bleak outlook for fall-run Chinook salmon in the San Joaquin River basin, because adult abundance is already near record lows. Sacramento River basin fall-run Chinook salmon are also likely to be impacted, but because of higher abundance and diversity of distribution compared to the San Joaquin River basin, the impacts on the population will likely be less than on the San Joaquin River basin.

Green Sturgeon

Information on Green Sturgeon is extremely limited. Adult green sturgeon migrate into the upper Sacramento River through the Delta in March and April. Last year, a review of telemetric data found 26 tagged green sturgeon entered the San Francisco Bay with only half migrating upstream. This year, one acoustically-tagged adult was recorded migrating past Sacramento this winter and based on typical migration rates, has reached Red Bluff. Adult green sturgeon have been observed to overwinter in the Sacramento River, and a number of tagged 2014 adults appeared to still be present in the upper Sacramento River as of January. According to the Biological Review, the proposed changes to D-1641 should not reduce riverine or through-Delta survival of juvenile green sturgeon. However, the changes in Sacramento River outflow during April and May can possibly delay juvenile, sub-adult, and adult green sturgeon migration.

Following is a summary from the Biological Review of the potential effects of the TUCP on green sturgeon.

Green sturgeon Life Stage	Life Stage Present	Tributary Habitat Effect	South/Central Delta Entrainment Effect	Facility Loss Effect
Egg	This life stage will be present in the Sacramento River in April-June.			
Sacramento	Yes	No Change	N/A	N/A
Juvenile	This life stage will be present in the Sacramento River and Delta April-September.			
Sacramento R	Yes	No Change	N/A	N/A
Delta	Yes	N/A	No Change	No Change
Subadults	This life stage may be present in the Delta April- September.			
Delta	Limited	N/A	No Change	No Change
Adults	This life stage will be present in the Sacramento River and Delta April-September.			
River	Yes	No Change	N/A	N/A
Delta	Yes	N/A	No Change	No Change

3.0 APPLICABILITY OF 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 April 1, 2015 Executive Order B-29-15 extended the waiver of CEQA and Water Code section 13247 contained in the prior proclamations and executive orders 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.)¹⁵

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). The State Water Board also posted the latest request of March 24, 2015, on its website and notified persons on its email distribution lists for Bay-Delta and drought matters of the request. Since the original petition was received in January 2015, the State Water Board has received numerous comments, objections, protests and petitions for reconsideration, including many on the March 24, 2015 request. This Order does not provide written responses to comments and objections due to the urgent nature of the request and the limited time to respond to the large number of comments and objections received. Written responses will be provided at a later date. Similarly, the State Water Board will consider the petitions for reconsideration at a later date. Although written responses are not being provided at this time, the comments, objections and issues raised in the petitions for reconsideration were considered in reaching this decision.

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 conditionally approves changes to Delta outflows, San Joaquin River flows, DCC Gate closure requirements, export constraints, and Western Delta EC requirements at Emmaton on the Sacramento River. This Order also 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.

As discussed above, this Order does not act on changes beyond June 2015. Because orders on temporary urgency changes expire 180 days from issuance, but may be renewed for an additional 180 days, the Petitioners must submit a renewal request for changes that extend beyond August 3. While changes to Delta outflows and Western Delta EC could have been acted on up to August 3, as discussed above, it is anticipated that an additional request to modify the TUCP Order will be submitted for July forward and potentially part of June. The January 15, 2015, Drought Contingency Plan indicates that under the 99 percent hydrologic exceedance, additional requests for changes will likely be made. Since the current hydrology is tracking the 99 percent exceedance, it is anticipated that a further request may be submitted as is contemplated under the Drought Contingency Plan. Accordingly, this Order only acts on changes through June. In addition, this Order also does not act on the requested changes to the EC requirements on the San Joaquin River at Vernalis because additional information is needed from the Petitioners on the effects of the proposed changes to other legal users of water. Absent additional information, the requisite findings regarding injury cannot be made.

Following is a summary of the changes conditionally approved in this Order:

- Reduction of the minimum Delta outflow requirement to 4,000 cfs during April, May, and June;
- Reduction of the San Joaquin River at Vernalis pulse flow requirement to 710 cfs at Vernalis in addition to compliance with the pulse flow requirement contained in the NMFS BO;
- Reduction of the San Joaquin River flow requirement following the pulse flow to 300 cfs through May 31 and 200 cfs in June;
- Allowance of the DCC Gates to be opened from April 1 to May 20 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;
- Modification of the Western Delta EC compliance point at Emmaton to Three-Mile Slough; and
- Modification of the export constraints to limit exports 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, provided that representatives of the fisheries agencies, State Water Board, Reclamation, and DWR agree that the increase in the export rate will not have an unreasonable effect on fish and wildlife and the Executive Director approves the use of the intermediate level. The use of any additional water exported pursuant to this provision must first be used to meet any unmet Project health and safety needs.

To avoid adverse New Melones end of the year storage conditions and associated water temperature, water quality and sediment issues as described above, this Order also requires Reclamation to develop and implement a plan acceptable to the Executive Director to reasonably protect fish and wildlife on the Stanislaus River going into next water year. The draft plan is due on April 15 with a final plan due by April 25, 2015. The Executive Director provided advanced notification of this requirement to Reclamation on March 30, 2015.

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 continues the condition from the February 3 and March 5 Orders 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 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 and adds additional information requirements to the requirement for DWR and Reclamation to develop monthly water balance estimates indicating actual and proposed operations through the end of the water year, including proposed and actual transfers. 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 further requires Reclamation to comply with the Temperature Management Plan as approved by the Executive Director and also modifies the dates for submittal of a draft and final plan in order to have the plan in place in time to inform earlier operational decisions. The Executive Director provided advanced notification of this requirement to Reclamation on March 30, 2015. 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"

As discussed in section 2.2, California is in its fourth year of drought. Reservoir levels are very low and will likely recede quickly due to historically low snowmelt and resulting significantly reduced inflows to reservoirs and streams. These reduced storage levels and reduced inflows create an urgent need to conserve, protect, and provide flexibility in making existing water resources available for various uses.

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.¹⁶ Assuming continued dry conditions, the changes approved in this Order are

¹⁶ 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

expected to result in significant water supply and storage benefits of over 1.2 MAF for various purposes as identified in the introduction. There will be impacts to fish and wildlife from the reduced flows and other changes. However, these effects will be offset to some extent by increasing cold water pool resources throughout the year and supplies for fisheries and other purposes. The increased storage will be realized in a combination of Shasta, Oroville, Folsom, New Melones, and potentially south of Delta Reservoirs where it will mitigate to some extent the low storage conditions caused by the drought and where it can be used for various purposes later in the year, including water supplies for contractors, salinity control and fisheries purposes. Increased water supply deliveries will benefit north and south of Delta Project contractors and refuges.

Assuming continued dry conditions, the changes approved in this Order could result in the following reductions in flows and increases in water supplies and storage.

**Reductions in Flows and Water Supply/Storage Savings
Under the TUCP Order February Through June***

Assumed D-1641 Requirements (cfs)	Feb	Mar	April	May	June
San Joaquin River Flows	725	1140	3110	710	710
Delta Outflows	7254	11400	7100	7100	7100
Salinity Compliance	N/A	N/A	Emmaton	Emmaton	Emmaton
TUCP Changes (cfs)	Feb	Mar	April	May	June
San Joaquin River Flows	500	500	710	300	300
Delta Outflows	4000	4000	4000	4000	4000
Salinity Compliance	N/A	N/A	Three-mile	Three-mile	Three-mile
Observed Savings (taf)	Feb	Mar	April	May	June
SJR @ Vernalis	0	31	TBD	TBD	TBD
Delta Outflow	0	395	TBD	TBD	TBD
Salinity Compliance	N/A	N/A	TBD	TBD	TBD
Total	0	426	TBD	TBD	TBD
Theoretical Savings (TAF)	Feb	Mar	April	May	June
San Joaquin River Flows	13	39	143	25	24
Delta Outflows	181	455	184	191	184
Salinity Compliance	N/A	N/A	0	54	14
Total	193	494	327	270	223
Total of Actual Savings February and March and Theoretical Savings April through June= 1,266 TAF					

*Notes: Assumes that hydrology is such that Table 4 D-1641 requirements are not applicable for the remainder of the year but that footnote 10 of Table 3 is applicable; assumes the same saving for salinity compliance as last year, though the savings this year will likely be higher than last year if conditions remain dry.

flow while lower values reflect the assumption that D-1641 March Table 4 requirements would be met primarily through salinity.

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 the export provisions. At a minimum, health and safety needs of the Projects should be possible to be met as a result of the changes approved in this order, as well as other uses.

Together, operations to meet unchanged Delta outflow, San Joaquin River flow, DCC Gate closure requirements, and Emmaton salinity could significantly reduce stored water supplies and opportunities to store additional supplies and reduce opportunities to export water, 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 approved by this Order, the Projects would need to reduce deliveries 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, 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, there is an urgent need for these changes.

The export allowances will 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 approval of the intermediate export rate will allow DWR and Reclamation to provide additional supplies to their contractors if storm events occur and exports can be made at the intermediate level without unreasonable effects on fish and wildlife. Though this change will not solve the very urgent water supply issues facing many Central Valley water users, it nonetheless addresses an urgent need.

In summary, in light of the severe magnitude and length of the drought, there is an urgent need for the proposed changes to address or help to minimize the significant impacts to water supplies that occurred last year and will likely occur again, and to help address the associated severe economic impacts in some communities, as well as impacts to fish, wildlife, and beneficial uses, 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 appropriate 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, legal users of water 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 natural and abandoned flows when they are not meeting the Sacramento River at Emmaton agricultural salinity requirement to prevent injury to other lawful users of water.

The Petitioners also conducted salinity modeling for the changes that indicates that the change in the salinity compliance location from Emmaton to Threemile Slough may result in increases in salinity in various locations in the Delta similar to what occurred last year. However, records of historic salinity measurements indicate that these increases would be less than what would occur without the Projects because the Projects ensure that salinity does not intrude upstream into the Delta by supplementing natural inflow with storage releases in very dry conditions like this year when salinity would otherwise intrude far upstream into the Delta. Based on the information provided, and as conditioned herein, the proposed changes will not injure other users of water due to changes in water quality.

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

The fisheries agencies submitted concurrence letters on March 27, 2015, indicating that the changes proposed in the TUCP are in compliance with ESA and CESA requirements.

In their concurrence letter, NMFS concurred with the proposed changes in the TUCP request with several provisions. NMFS, indicated that it expects exports at the intermediate export level to be approved by members of the RTDOMT and Executive Director and limited to natural and abandoned flows and for operations of the DCC Gates to follow specified criteria to avoid impacts to fish species. NMFS also indicated that it expects the entirety of the NMFS BO spring pulse flows, as advised by the Stanislaus Operations Group with subsequent concurrence by NMFS, and as modeled for the Biological Review, will be implemented. NMFS expressed concern about the end of September storage levels projected in New Melones Reservoir and risks to listed steelhead and fall-run Chinook salmon from associated water at temperatures that may not provide suitable habitat as well as water quality concerns with sediment, inadequate dissolved oxygen and other concerns. NMFS also indicated that it expects the Sacramento River Temperature Task Group (SRTTG) to provide additional detail and coordination on the Sacramento Temperature Management Plan and spring, summer and fall operations of Shasta Reservoir. NMFS indicated that in order to develop a Sacramento River Temperature Management Plan, Reclamation and DWR should include a flow schedule for the Sacramento River with specific monthly range of Keswick releases from April through October, an end of May storage target, and an examination of how depletions were analyzed. NMFS also stated that Reclamation should plan its operations throughout the summer and into the fall to minimize, to the extent possible, the amount or extent of winter-run red dewatering, and also maintain

temperature compliance at Clear Creek throughout the temperature management season, ending on October 31.

USFWS's concurrence letter states that USFWS accepts Reclamation's determination that the proposed changes will not result in additional adverse impacts to delta smelt or their critical habitat during April and May beyond the effects previously analyzed in the 2008 USFWS BO. However, because the biological review included a limited amount of information for the changes beyond May, the USFWS requested further information prior to reaching a determination on operations through September. Based on additional information and input from the USFWS for changes after May, this Order may be further modified.

Based on the concurrence determinations by USFWS and NMFS and based on CDFW's review of the changes and associated Biological Review, CDFW also concurred that the existing CDFW consistency determinations remain in effect and no further CESA authorization from CDFW is necessary for the changes. In their letter, CDFW also recommends that the RTDOMT discuss any storage gains that may occur and the appropriate use of those gains towards ensuring environmental protections and protection against a potential fifth year of dry conditions. CDFW also recommends that the RTDOMT continue examination of ideas and options to best manage for winter-run Chinook salmon conditions in the upper Sacramento River and salmon and steelhead in the San Joaquin River system.

The concurrence letters submitted by the fisheries agencies support the conclusion that the proposed changes in Project operations are within the range of effects previously analyzed or are otherwise within the scope of the BOs, 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.

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. Information submitted by the fisheries agencies on February 26 summarized 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 storage levels and historically dry conditions will likely lead to critical water shortages in 2015. These 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 flow and water quality 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 for salinity control, cold-water flows for fish, and minimal uses going into the

next water year. Based on the limited water storage available and potential continuance of dry hydrologic conditions, the changes in this Order were approved to benefit storage available in Project reservoirs later in the year, for agricultural and other water supply users, as well as 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 (including the Temperature Management Plan as discussed above), there are existing regulatory requirements outside the State Water Board process that may also help to ensure that these minimal requirements are met regardless of the changes specified in this Order. 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. The changes approved in this Order will help to meet these regulatory requirements. Because temperature releases are non-consumptive however, the changes will primarily benefit water supplies.

Water supply benefits 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 significant concerns that must be balanced with protections for fish and wildlife.

To ensure that the changes approved in this Order that may reduce flows will not have unreasonable impacts on fish and wildlife, this Order includes several provisions including:

1. To address the significant concerns with temperatures for winter-run and other Sacramento River salmonids, Reclamation will be required to operate in compliance with a Temperature Management Plan (Condition 6) approved by the Executive Director. The intent of the Temperature Management Plan is to protect fish and wildlife beneficial uses. Specifically, the plan will 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. Any uncertainty associated with changing hydrologic conditions and future drought circumstances will be addressed in the plan through continuing updates as conditions change or upon the request of the fisheries agencies or Executive Director. Additionally, condition 6 requires Reclamation to conduct additional modeling and planning for temperature control to ensure that any tradeoffs for temperature control will be realized this year.
2. To address the concerns described above with operations of New Melones, this Order requires Reclamation to develop and implement a plan approved by the Executive Director to protect fish and wildlife beneficial uses on the Stanislaus River. The Plan is required to address concerns with adequate supplies and temperature management for salmonids throughout this water year and going into next as well as water quality concerns, including sediment and dissolved oxygen levels. This Order also requires

Reclamation to comply both with the requested change in flows at Vernalis on the San Joaquin River, as well as the NMFS Biological Opinion flow requirements as modified by the Stanislaus Operations Group and approved by NMFS.

3. 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.

In summary, the changes that may result in reductions in flows 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. The requested changes to requirements of the San Joaquin River are intended to conserve water in New Melones Reservoir to help balance the competing needs of the Stanislaus River (described above) and conditions on the San Joaquin River. Additionally, the reductions to Delta outflows, opening of the DCC Gates at times, and change in Western Delta EC requirements will allow the Projects to conserve upstream storage for use later in the year for fish and wildlife and other uses. 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.

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 April and May 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. However, these effects will be limited since most of these fish are already downstream of the DCC. Potential hazards include increased entrainment, predation, and salvage. These impacts will be reduced by implementing the DCC Gate triggers matrix proposed in the TUCP. If the Projects determine that the DCC gates must open to provide for salinity management in the Delta during a period that requires closure under D-1641 or the NMFS BO then the Projects, through the RTDOMT process, will provide notice to the fisheries agencies so that enhanced monitoring can begin. The Projects will implement enhanced monitoring and triggers to open and close the gates, as needed for the protection of listed fish. Further, the tradeoff with maintaining upstream storage will also reduce impacts to other uses as discussed above. The potential for impairment to fish and wildlife and other 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, according to the Biological Review, it is likely that longfin smelt larvae in the San Joaquin River (Prisoner's Point and upstream) and in the south Delta will have a somewhat increased risk of entrainment into the south Delta associated with the requested changes. Additionally, salvage of juvenile winter-run Chinook salmon is projected to remain moderate if exports increase in April and May. However, as discussed above (section 2.7), the

Projects would shift exports from the SWP to the CVP in order to reduce the risks associated with entrainment loss¹⁷.

As discussed above, this Order approves the requested intermediate pumping level of 3,500 cfs when NDOI is at least 5,500 cfs provided that representatives from the fisheries agencies, State Water Board, DWR, and Reclamation agree that any use of the intermediate pumping rate can be conducted without unreasonable impacts to fish and wildlife and provided that the Executive Director approves its use. In addition, this Order requires that the water be used for health and safety purposes prior to other uses. 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 March 5 Order. Also consistent with the March 5 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. Further, the export of additional water is limited to natural and abandoned flows ensuring that stored water is maintained in upstream reservoirs for use later in the season for fish and wildlife and other purposes. 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.

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 requires planning, continues reporting, consulting, and monitoring requirements and authority to modify the Order to ensure that it remains in the public interest.

¹⁷ Preferentially shifting exports to the CVP will help reduce increased impact on migrating fisheries due to increased pumping. This export shift typically increases survival of salmonids through these facilities since fewer fish will enter the SWP where losses are higher due to substantial pre-screen mortality associated with CCF.

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 March 5 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 March 5 Order is affirmed, subject to the modifications and additional changes set forth below. Changes to the March 5 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~~**June 30**, 2015.

1. Except as otherwise provided in condition 2, below, during ~~February and March of 2015~~ **the time periods specified below**, 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~~**April, May, and June** 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:
 - i **Reclamation shall continue to provide a pulse flow from the date of this order until April 25. The total volume of the pulse flow shall be no less than 710 cfs at Vernalis during the pulse flow period from March 25 through April 25. In addition, Reclamation shall comply with the minimum flow schedule contained in Appendix 2-E of the National Marine Fisheries Service's (NMFS) Biological Opinion and Conference Opinion on the Long-Term Operations of the CVP and SWP, as that schedule is modified based on the advice of the Stanislaus Operations Group and with the concurrence of NMFS.**
 - ii ~~¶~~**The average** minimum flow rate **at Vernalis during the months of February and March between April 26 and May 31** shall be no less than ~~500~~**300** cfs ~~on a monthly average.~~ **The seven-day running average**

during this period shall not be less than 20 percent below the minimum flow rate.

iii The minimum flow rate at Vernalis in June shall be no less than 200 cfs on a monthly average. The seven-day running average during this period shall not be less than 20 percent below the minimum flow rate.

iv In consultation with the Department of Fish and Wildlife, NMFS, the U.S. Fish and Wildlife Service (collectively fisheries agencies) and State Water Board staff, Reclamation shall prepare a plan to reasonably protect fish and wildlife on the Stanislaus River at the March 99 percent hydrologic exceedance level. The plan shall identify needed storage and flow levels for the protection of fish and wildlife throughout water year 2015 going into water year 2016 to ensure adequate temperature and water quality conditions for salmonid species inhabiting the Stanislaus River, including how those conditions will be achieved. The draft plan shall be submitted to the Executive Director and fisheries agencies for comment by April 15, 2015. A final plan shall be submitted to the Executive Director by April 25, 2015. Reclamation shall implement the approved plan and any changes directed by the Executive Director necessary to reasonably protect fish and wildlife.

- 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 between April 1 and May 20** 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 between April 1 and May 20** 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. **During April, May, and June,** ~~the~~ 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~~
 - iii. 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, and~~ representatives of the fisheries agencies, the State Water Board, DWR, and Reclamation agree that the increase in the export rate can be implemented without causing unreasonable harm to fish or wildlife. If Any plan to exercise this intermediate pumping level DWR and Reclamation make this determination, they must be approved by 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. To the extent that any unmet Project health and safety needs can be met with water diverted under the intermediate pumping level, those needs shall be met prior to use of the water for other purposes.~~ 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~~Reclamation.
 - iv. 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 ~~4e1.d.v~~.
 - v. These export limitations do not apply to water transfers. 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.
 - e. During April, May, and June, the Table 2 Western Delta Sacramento River at Emmaton electrical conductivity (EC) compliance location is moved to Threemile Slough on the Sacramento River.
2. DWR and Reclamation shall consult on a regular basis with designated representatives from the State Water Board ~~and, 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 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, the following information shall be provided under at least the 50 percent, 90 percent, and 99 percent hydrologic exceedance scenarios:
 - a. **Upstream: Inflows to and storage levels in the major reservoirs (Shasta, Folsom, Oroville, Trinity, Whiskeytown, New Melones). River releases from the aforementioned reservoirs. Flows in the San Joaquin River above the junction with the Stanislaus River. Transfers from the Trinity system, including Carr Power Plant and Spring Creek Tunnel flows.**
 - b. Delta: inflows, channel depletions, exports, and outflows;
 - c. SWP: deliveries to Feather River Service Area contractors, North of Delta Table A contractors, South of Delta Table A contractors;
 - d. 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
 - e. 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 13, 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 at both the 90 and 99 percent exceedance levels:** (a) Reclamation's ~~preferred~~ **proposed** operations ~~and~~, (b) the fisheries agencies' ~~and State Water Board staffs' requested preferred~~ **operational scenarios 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 ~~and State Water Board staff~~ **and State Water Board staff** 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 analyses above shall be included in a revised draft Temperature Management Plan that includes requested information from the State Water Board and fisheries agencies. A draft** ~~The updated~~ 2015 temperature management plan shall be submitted to the ~~Executive Director and~~ **Executive Director and** Sacramento River Temperature Task Group (SRTTG) for review no later than ~~March 25~~ **April 6**, 2015, with updates as necessary to reflect changing conditions. The final Temperature Management Control Plan shall be submitted to the ~~Executive Director of the State Water Board for approval by June 4~~ **Executive Director of the State Water Board for approval by April 13**, 2015. **The plan shall provide reasonable protection for winter-run Chinook salmon at the March 2015 99 percent hydrologic exceedance level.** Temperature model

input and output files for all scenarios shall be included as an appendix to the **draft and final** 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 **2015 Sacramento River Temperature Management Control** Plan shall include updated model results ~~for all three scenarios~~. **Reclamation shall implement the plan with any changes required by the Executive Director.** 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 provide notes from the meetings to the SRTTG within 5 days following the meeting.** 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. **While DWR and Reclamation are operating under the changes approved by condition 1.e. of this Order, they** shall bypass natural and abandoned flows ~~to the extent necessary~~ to prevent injury to ~~senior water right holders~~ **other lawful users of water.**
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: April 6, 2015*