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BEFORE THE CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the matter of 2016 SWRCB Hearing re CalWaterFix Petition for Change	**TESTIMONY OF STEVE MELLO, NORTH DELTA WATER AGENCY**

PERSONAL BACKGROUND

1. My name is Steve Mello. I am the current Chairman of the Board of Directors of the North Delta Water Agency ("NDWA"). I have served on the NDWA Board of Directors since 2001. I also serve as President of the Board of Directors of Reclamation District 563, which provides flood control and drainage services to lands located within NDWA. From 1993 to 2001, I served as NDWA's representative on the Delta Protection Commission. I was a founding member of the Delta chapter of Ducks Unlimited and a founding member of the North Delta Conservancy, a 501(c)(3) nonprofit organization.

2. I am a third-generation farmer in the north Delta. My family has been farming in NDWA since approximately 1955. I have been a farmer in this area for more than 40 years. I currently farm approximately 2,000 acres of land within NDWA. The principal crops I grow are corn, grain sorghum, seed barley and pears.

3. I am personally familiar with agricultural and irrigation practices in NDWA and with the various types of water diversion facilities (including gravity siphons) utilized by farmers in the area. Specifically, Mello Farms operates one gravity siphon diversion on Georgiana Slough and nine gravity siphon diversions on the North Fork Mokelumne River. Mello Farms also operates one diversion pump on Georgiana Slough and one diversion pump on Lost Slough. I utilize surface water diverted from these Delta channels to irrigate my crops and I am familiar with water level and water quality issues (in particular salt loading) as they relate to farming within NDWA.

SUMMARY OF TESTIMONY

4. If the so-called "California WaterFix" Project ("Project") is approved and constructed, NDWA would be ground zero for Project-related impacts. During Part 2 of this hearing NDWA will present evidence regarding the environmental and socio-economic impacts that would be caused by construction and operation of the Project. The focus of my Part 1B testimony is the issue of whether the Petitioners, the California Department of Water Resources ("DWR") and the U.S. Bureau of Reclamation ("Reclamation"), have established that the Project

will not cause injury to other legal users of water. It is the position of NDWA that the Petitioners have not established that the Project will not injure legal users of water, for the following reasons:

(a) As described in the Testimony of Walter Bourez, Shankar Parvathinathan and Gary Kienlen of MBK Engineers, the modeling conducted by the Petitioners, which forms the basis for Petitioners' analysis of injury, is deeply flawed. I am concerned that the modeling, because of its many flaws, significantly underestimates the water quality impacts of the Project within NDWA. I am concerned that the Project will cause an increase in salinity in NDWA during certain times of the year which, in turn, will harm legal users of water. In this testimony I describe my personal experience with salt loading in relation to farming in the north Delta and how salt loading can affect crop yields, crop survival and long-term land productivity.

(b) I am also deeply concerned that the Project will affect water surface elevations within NDWA. In this testimony I describe my personal experience in relation to changes in water surface elevations and how such changes can adversely affect the ability of farmers to divert and use water particularly when using gravity siphons, which are prevalent in NDWA.

PHYSICAL SETTING

5. Exhibit NDWA-33 is a true and correct copy of a map showing the boundaries of NDWA as defined in the North Delta Water Agency Act, Chapter 283, Statutes of 1973, as amended. NDWA's boundaries encompass approximately 302,000 gross acres including substantially all of that portion of the Sacramento-San Joaquin Delta, as defined in Cal. Water Code section 12220, that is situated within Sacramento, Yolo and Solano Counties. Also included within NDWA's boundaries are certain lands in northeastern San Joaquin County comprising New Hope Tract, Canal Ranch and Staten Island.

6. Exhibit NDWA-40 is a short film that presents a "flyover" view of the NDWA service area that was prepared at my direction. I will provide narration for the film during the Part 1B hearing. The film begins at the "I" Street Bridge over the Sacramento River in the City of Sacramento which is the northern edge of the legal Delta as defined in Water Code Section

12220. From there the film proceeds south along the Sacramento River passing by the community of Clarksburg and the proposed locations of the Project intakes. The film shows the various watercourses that comprise the NDWA waterways and man-made structures such as the Delta Cross Channel. It also shows the rich agricultural lands of the NDWA and various NDWA islands and communities. Finally, the film shows the locations of the Project's proposed three new intakes on the Sacramento River.

HISTORY OF NORTH DELTA WATER AGENCY

7. Beginning approximately 160 years ago, farmers within the area now comprising NDWA began reclaiming lands from flooding, appropriating water to beneficial use and establishing vibrant agricultural communities. Reclamation began constructing the Central Valley Project ("CVP") in the late 1930s, damming the major tributaries on the Sacramento River and holding back substantial quantities of the Delta water supply. As it did with landowners along the Sacramento River, the United States conducted extensive studies and negotiations to ensure a sufficient supply for water right holders in the north Delta. Discussions with Delta landowners were protracted, however, due to the complex issues of both water quantity and quality, and the issues only intensified with the construction of the State Water Project ("SWP") by DWR.

8. NDWA was formed to represent northern Delta interests in negotiating a contract with both Reclamation and DWR in order to mitigate the water rights impacts of the CVP and SWP. NDWA was formed by a special act of the Legislature in 1973. (North Delta Water Agency Act, Chapter 283, Statutes of 1973). From 1974 to 1979, NDWA, Reclamation and DWR determined the outflow necessary to meet water quality objectives for irrigated agriculture and reviewed the paramount water rights of landowners within NDWA's boundaries. The agencies also evaluated the Delta channels' historical function as natural seasonal storage. Before the CVP and SWP began withholding much of the Sacramento River system's high winter and spring flows, the Delta channels stored sufficient fresh water to sustain water quality in the north Delta throughout and often beyond the irrigation season. Since the CVP and SWP commenced

operations, however, the Delta functions more like a flowing stream and, as a result, relatively minor decreases in outflow can have a serious impact on north Delta water quality and water surface elevations.

9. In 1981, DWR and NDWA executed a Contract for the Assurance of a Dependable Water Supply of Suitable Quality ("1981 Contract"), a true and correct copy of which has been submitted in this proceeding as Exhibit DWR-306. While I am not an attorney, my understanding is that the 1981 Contract is a guarantee by the State of California that, on an ongoing basis, it will ensure that suitable water will be available in the northern Delta for agriculture and other beneficial uses. The 1981 Contract and related agreements and amendments are discussed in more detail in the Testimony of Melinda Terry (Exhibit NDWA-7).

AGRICULTURAL WATER USE WITHIN NDWA

10. The crop mix within NDWA has changed dramatically over the past forty years. Historically the predominant crops were pears, coarse and cereal grains, sugar beets, asparagus, tomatoes and alfalfa. However, in the past two decades permanent crops—in particular wine grapes, cherries and other fruit trees—have been planted extensively within NDWA. For example, approximately 8,000 acres of premium wine grapes are now grown in Reclamation District 999, located in and around Clarksburg, California. The Clarksburg American Viticultural Area (AVA) was established in 1984 and is an important wine grape growing region.

11. The irrigation season within NDWA is typically April through September; however, it varies by crop. Depending on the weather, wine grapes and pear trees are often irrigated through October and sometimes into November. Once the irrigation season is over many farmers pre-irrigate in September and October for spring crops.

12. Water diversions within NDWA occur by two principal methods: siphons and electric pumps. A siphon is a pipe over the levee. A siphon operates without a power source by running water by gravity. A siphon is primed by using a suction pump to remove the air from the pipe, creating a vacuum, then opening a valve on the land side. If the water surface is high enough above the land surface, the vacuum "pulls" the water over the levee and the water runs

into the land side irrigation system via gravity. If the elevation differential between the water surface elevation and the land surface elevation (referred to as "head") is not sufficient, the siphon will not work. Based on my personal experience one needs about a 3 foot differential to get the siphon to work. The volume of water the siphon will provide increases with more head, allowing greater amounts of water for irrigation.

13. The siphon systems within NDWA were designed with historic water surface elevations in north Delta channels as a base line. If an electric pump is needed to replace a siphon, the costs are quite substantial. For example, if power lines are present at the landside base of the levee, the costs are $25,000 for the utility to put a transformer and string power to the new electric pump. In addition, a new pump column, impellor and motor of sufficient size to replace a 12-inch siphon's water flow are an additional $25,000. The labor to install the pump facility is an additional $8,000. Permit costs and timelines need to be added.

14. In many cases, power lines are not present at the land side base of the levee. The cost of stringing new wires and poles are $50,000 per quarter mile. On many islands (Tyler Island is a good example), there is not enough voltage to supply the power needed for new power draws on the existing utility company system. New pumps will necessitate improvements in the utility provider's electrical system. Those costs are also the responsibility of the landowner.

15. As an example with which I am personally familiar, Stoke Farms on Tyler Island has six siphons on the North Fork Mokelumne River. The water surface elevation head is sufficient for siphon operation at historic water surface elevations. When the Delta Cross Channel ("DCC") gates are open, these siphons flow enough water volume to irrigate about 1,000 acres. When the DCC gates are closed, the siphons operate much less efficiently. Two siphons are located with power lines at the land side base of the levee. Replacement of the siphons with pumps would cost approximately $116,000. Four siphons are located between 0.5 and 1.5 miles from the nearest power source and in the aggregate would cost approximately $232,000 for parts, such as transformers, pump, etc., and installation. The cost to string power lines and poles would be an additional $300,000. The total cost to replace those six siphons with electric pumps would

be approximately $648,000 to allow Stoke Farms to irrigate 1,000 acres. Electric generators or internal combustion engines are other alternatives that could be considered, but these involve logistical and repair problems and also would be very costly. Air emissions may also be an issue, as well as fees from the local Air Quality Control District.

16. Due to the proximity of NDWA to salt water from San Francisco Bay and the strong tidal influence within NDWA waterways, the issue of salt accumulation (also known as salt loading) has always been a major concern for farmers in the north Delta. Salt loading of soils occurs when water degraded by salt compounds is used for irrigation of crops. Use of water degraded by salt compounds, even over a short period of time, degrades the long-term productivity of the ground. Salt-loaded soil loses monetary value by limiting the types of crops that can be grown on the land and reducing the yield, quality and value of crops that are grown. In annual crops, mature plants are more tolerant of irrigation water containing salts than are seedling plants. However, salt loading of soil hurts seedling crops, reducing the ability of young plants to become established.

17. Permanent crops are especially intolerant of salt loading. Suffice it to say that farmers who desire to survive long-term in the north Delta must be very concerned with salt loading issues.

18. I am familiar with one example of the adverse effects of salt loading on agriculture within NDWA. Following the severe drought of 1976-77, crop yields on Sherman Island recovered to only about 80 percent of what they had been before the soil became salt loaded during the drought. The productivity of the crops on Sherman Island has never fully recovered. Since the 1981 Contract was amended in the 1990s to move the water quality compliance point upstream from Emmaton to Three Mile Slough, farmers on Sherman Island can now attain yields for corn of only approximately 3 to 3.5 tons per acre on ground that prior to 1976 produced corn crops that won yield contests (approximately 6 tons per acre).

19. California entered the 2014-2015 water years in the midst of a severe drought. The 2014-2015 water years also had low rainfall and snow accumulations that exacerbated an

already bad situation. In NDWA, water surface elevations in the rivers and sloughs were unusually low, due to very low natural run-off and low reservoir releases. This resulted in problems for farmers that divert from north Delta channels, as described in paragraph 20 of my testimony below. These problems were magnified by invasive aquatic vegetation that flourished in the atypically warm water. For the first time since at least 1955, Mello Farms had to hire a diver (three times) to clear intakes of invasive aquatic vegetation.

20. The low water surface elevations in the Delta channels in 2014-2015 also greatly diminished the volume of water our pumps and siphons could provide for irrigation. This lower volume significantly increased (i) the duration of pumping and (ii) irrigation costs through higher costs for electricity and labor. Historically, the pump at a ranch I own on Georgiana Slough was able to irrigate 123 acres in 5 days and nights with forty-two 4-inch siphon pipes. In 2015 we could only run twenty-eight 4-inch siphon pipes in the spring and summer, which resulted in an almost 8 day irrigation cycle for the same amount of ground. This delay caused a significant drop in alfalfa production (tonnage) and a significant decrease in alfalfa quality that resulted in lower prices per ton. This double negative reduced my income per acre by about 30 percent. Lower volumes out of our only other pump, which diverts from Lost Slough, resulted in extended irrigation timelines for our pear crop. This extended irrigation period negatively impacted our ability to spray the orchard in a timely manner and resulted in disease problems for the trees. Those diseases reduced my crop yields by approximately 50 percent and caused me to spend approximately $1,800 per acre on hand labor to cut out diseased limbs. This will also diminish production in future years.

21. Our siphon diversions on Georgiana Slough and the North Fork Mokelumne River also operated with diminished efficiency due to the low water levels in 2014-2015. This extended irrigation time resulted in increased labor costs and a less timely irrigation of my wheat and corn crops. The wheat was not hurt, but my corn yields were off 20 percent. The damage could have been worse had the temperature been higher.

THE CALIFORNIA "WATERFIX" PROJECT

22. As noted above, it is the position of NDWA that the Petitioners have failed to establish that the "California WaterFix" Project will not cause injury to legal users of water within NDWA. While I am not an engineer, from my perspective as a layperson, the serious flaws in the Project modeling that have been described by MBK Engineers in this proceeding raise serious questions about the validity of the entire Project impact analysis. I am concerned in particular that the Project will (i) adversely affect water quality in the NDWA; and (ii) affect hydrodynamics and surface water elevations within NDWA. My concerns are described in further detail in paragraphs 23 through 28 below.

23. **Water Quality.** In his testimony, Mr. Nader-Tehrani states in relevant part: "For all scenarios except Boundary 2, in the months of July and August there is an increase in EC at Emmaton of about 18-19 percent when compared to the NAA. [Exhibit citations omitted] DWR-EC values for Boundary 2 are higher than those for NAA for the month of July by about 5 percent and are lower than those for NAA for the month of August by about 19 percent." (Exhibit DWR-66, p. 5, lines 16-20.)

24. As a farmer I am concerned about the chronic versus acute impacts of higher salt levels in the water I use to irrigate. This is a particularly significant issue for permanent crops such as fruit trees and wine grapes. As I often say, "you only have to kill or hurt my trees (or my vines) one time." As I explained in Paragraph 17, once permanent crops are lost or hurt due to salt loading it will take a long time for the land to fully regain its productivity (if ever) and for the agricultural economy of NDWA to recover, if it ever does recover. Once ground is salt loaded, growing permanent crops may not be possible in some areas.

25. Water quality is monitored in accordance with the 1981 Contract at Three Mile Slough, which is located upstream from Emmaton. I am familiar with the crops grown in the 3.7 mile stretch of the Sacramento River between the Rio Vista Bridge and the Three Mile Slough Bridge. In this stretch, the following permanent crops are being grown: cherries, chestnuts, figs, and pomegranates. In addition, the following non-permanent crops are being grown on southwest

Brannan Island: corn, alfalfa and safflower. Three Mile Slough feeds the irrigation source for southwest Brannan Island.

26. I am concerned that the projected 18-19 percent increase in EC at Emmaton, as described in Dr. Nader-Tehrani's testimony, does not tell the whole story regarding salinity-related impacts of the WaterFix Project. The Testimony of Gary Kienlen describes how the use of averages, in this context, can be misleading. (Exhibit NDWA-3). I am specifically concerned about large spikes in EC that may occur as a result of implementation of the Project. As I previously testified, salt loading of soils occurs when water degraded by salt compounds is used for irrigation of crops. Use of water degraded by salt compounds, even over a short period of time, degrades the long-term productivity of the ground. Permanent crops are especially intolerant of salt loading. While I do not grow wine grapes I do have a pear orchard and I am quite concerned about the devastating effects salt loading can have on the yield of pear orchards and the long-term health of pear trees. The same concern is valid with respect to the cherry, chestnut, fig and pomegranate trees grown in the vicinity of Three Mile Slough.

27. **Delta Hydrodynamics and Changes in Water Surface Elevations.** The modeling work performed by DWR and Reclamation for the Project, as described and interpreted in a memorandum prepared by MBK Engineers (Exhibit NDWA-32), indicates that the Project will cause a decrease in River stage (water surface elevation) in certain areas of NDWA. In addition to the modeling, common sense suggests that if you divert massive quantities of water from the Sacramento River immediately upstream from an active farming area, surface water elevations in the areas in proximity to the new points of diversion will drop. What effect will a decrease in River stage have in terms of the practical ability of a farmer to farm within NDWA? The answer to this question will vary by location and method of water diversion. As explained above in paragraphs 12-15, changes in water levels can require modifications to or replacements of gravity siphons. In other areas, lowered water levels can greatly diminish the volume of water pumped from pumps or siphons as I explained in paragraph 20.

28. As demonstrated by this testimony, lower water surface elevations in north Delta

channels can have devastating economic consequences for north Delta farmers. If the proposed Project will result in lower water surface elevations within NDWA (as I believe it will, based on the testimony of MBK Engineers and DWR's own witnesses), farmers within NDWA must be made whole for all economic losses suffered as a result of the operation of the proposed Project, including but not limited to increased pumping costs, increased infrastructure costs, increased operation and maintenance costs and diminution in the value of their land.