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**BEFORE THE  
CALIFORNIA STATE WATER RESOURCES CONTROL BOARD**

HEARING IN THE MATTER OF CALIFORNIA	)	
DEPARTMENT OF WATER RESOURCES AND	)	<b>TESTIMONY OF</b>
UNITED STATES BUREAU OF RECLAMATION	)	<b>FERGUS MORRISSEY</b>
REQUEST FOR A CHANGE IN POINT OF	)	
DIVERSION FOR CALIFORNIA WATERFIX	)	

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**I. SUMMARY**

1. My testimony begins with a statement of my qualifications and work experience. Next, I provide a general description of the Friant Division. Then I describe the Orange Cove Irrigation District including the total acreage served by the District, the location of the District, and a general description of the District’s water delivery system. Next, I discuss the District’s surface water supply from the Friant Division and the relationship of that supply to the limited locally available groundwater supplies within the District. Finally, I describe efforts taken by the District to respond to water shortages in the Friant Division in recent years, and the impacts of these shortages on the District and its water users.

**II. QUALIFICATIONS**

2. Since 2008, I have served as the Engineer-Manager of Orange Cove Irrigation District (“Orange Cove” or “District”) with experience in the daily management of

the District's water supply from the Friant Division of the Central Valley Project ("Friant Division"). My responsibilities include the operation and maintenance of the pumping and piping network, which conveys available surface water irrigation supply to the District's growers in conjunction with the growers' available groundwater supply underlying their farmland; hydropower plant operation and maintenance; and the administration of Orange Cove's permanent contract (Contract No. I75r-1672D) (Exhibit No. DOI-18) with the United States Department of the Interior, Bureau of Reclamation. I hold a Bachelor of Science degree in Agricultural Engineering from California State Polytechnic University at Pomona and a Master of Science in Hydrologic Science from the University of California, Davis. I served for nine years as staff engineer with the Friant Water Users Authority and its successor in interest the Friant Water Authority. My responsibilities for each entity were the same. I had direct responsibility for a wide range of engineering activities relating to the operation and maintenance of the Friant-Kern Canal system and facilities, and management of the annual San Joaquin River water supply of the Friant Division, which is regulated at Friant Dam and Millerton Lake and then diverted and conveyed to over 125 delivery points located between Fresno and Kern County. As a result of my water management experience, I have become generally familiar with the Friant Division's annual water supply, local groundwater conditions, and the system of delivery of San Joaquin River water to Orange Cove and other contractors within the Friant Division. A true and correct copy of my resume has been submitted as Exhibit No. FWA-59.

### **III. FRIANT DIVISION**

3. The Friant Division spans from Madera County in the north to Kern County in the south. The principal features of the Friant Division include Friant Dam, Millerton Lake and the Madera and Friant-Kern Canals. It is my understanding that the primary purpose of Millerton Lake is to regulate the run-off of the San Joaquin River for diversion into the Madera and Friant-Kern Canals to provide supplemental and new irrigation water to water agencies such as Orange Cove and other Friant Division contractors. A true and correct copy of a map depicting the water agencies located within the Friant Division is identified as Exhibit No. FWA-60.

### **IV. ORANGE COVE IRRIGATION DISTRICT**

4. Orange Cove is a California irrigation district (Water Code, Division 11, Section 20500 et seq.) formed in 1937 for the purpose of importing surface water to the area, which is rich in soils and climate but limited in its available local groundwater supply. Orange Cove is located in the middle of the Friant Division and starts about 35 miles from the Friant-Kern Canal's beginning at Millerton Lake. The District boundaries comprise approximately 27,936 acres currently serving 365 farms with water to 800 active delivery points. A true and correct copy of a map of the District is included as Exhibit A to Orange Cove permanent contract (Exhibit No. FWA-61). The District boundary is long and narrow, generally following the path of the Friant-Kern Canal over a distance of approximately 20 miles in portions of Fresno and Tulare Counties adjacent to the western foothills of the Sierra Nevada, about 30 miles southeast of Fresno and 20 miles north of Visalia. Along this 20 miles the District currently has 14 separate turnouts from the Friant-Kern Canal and 14 systems

to deliver water to grower parcels through buried pressurized pipelines. In all there are approximately 120 miles of District pipeline and 45 electrically driven pumps to serve an irrigation water supply to delivery points within the 45 square mile area comprising the District. Each delivery point includes a propeller meter that measures the delivered water to within an accuracy of +/- 2%.

**V. ORANGE COVE IRRIGATION DISTRICT'S SURFACE WATER SUPPLY**

5. Orange Cove has a permanent contract with the United States which provides for the delivery of a surface water supply, by means of the Friant Division, from the San Joaquin River, and as otherwise authorized in that contract (Exhibit No. DOI-18). More specifically, the District has a Class 1 water supply in the amount of 39,200 acre-feet per year for the water stored in or flowing through Millerton Lake. The District does not have an additional Class 2 water supply.
6. The quantity of the District's Friant Division contract supply was determined by the United States in its needs analysis study conducted specifically (but not exclusively) with regard to Orange Cove in the 1940's. That analysis was predicated on a detailed study evaluating the anticipated total acreage of the District when completely developed, the probable crop distribution and associated crop consumptive demand within the District, the locally available effective precipitation and any groundwater supply available in the District, as well as the anticipated Friant Division San Joaquin River supply according to various water rights, permits and contracts acquired and entered into by the United States in order implement the authorized plan for development of the Friant Division.

7. Annual records of the irrigated acreage, water requirements and use of available surface water and local groundwater within the District have been maintained by Orange Cove beginning in 1949 up through 2015. A true and correct copy of this table has been submitted as Exhibit No. FWA-62. Records for the entire period of record (1949-2015) establish that 68% Orange Cove's crop irrigation water requirement has been satisfied by surface water deliveries.
8. In water years 2014 and 2015, the United States made no allocation of San Joaquin River water to Orange Cove. (Exhibit No. DOI-8) In those years the surface water deliveries made by the District from urgency short-term sources was only 14.5% and 14.6% respectively of the crop irrigation requirement. (Exhibit No. FWA-62)
9. Because the San Joaquin Valley is an arid desert region, the effective precipitation in the region fluctuates significantly, and is capable of contributing a relatively small fraction of the required consumptive needs of the crops grown in Orange Cove.

## **VI. RELATIONSHIP TO LOCALLY AVAILABLE GROUNDWATER SUPPLY**

10. Very little of the farmland in Orange Cove has adequate groundwater supply to sustain and fully satisfy the total crop requirements of the farming operations without a surface water supply from the Friant Division. The District overlies a portion of the Kings Sub-Basin 5-22.08, which the California Department of Water Resources designated as critically overdrafted (Exhibit No. FWA-63).
11. District water records show that when Friant Division surface water supplies delivered to Orange Cove are reduced and are insufficient to satisfy the total crop irrigation requirement in a given year (e.g., 1988-1991, 2012-2015), the local groundwater supplies within the District are relied upon more heavily and the total

depth to groundwater increases. (Exhibit No. FWA-62) At the end of 2015 water year, for example, the groundwater elevations in Orange Cove had declined so severely that they had nearly returned to the poor groundwater conditions that existed at the start of Friant Division, which were nearly the lowest (that is, the worst) groundwater elevations in Orange Cove for the entire historic record. (Exhibit No. FWA-64)

12. Further evidence of the direct relationship between local groundwater elevations in Orange Cove and the delivery of Friant Division surface water is demonstrated in a chart entitled “Groundwater Surface Elevation Trend in Orange Cove Irrigation District Water Year Basis – 1952-2015.” A true and correct copy of the District’s data is summarized in the chart provided in Exhibit No. FWA-64. In the most recent drought period of 2012-2015, which included two water years (2014 and 2015) in which the United States did not deliver any water from the San Joaquin River to Orange Cove, the groundwater elevation at the end of each year showed a decline.
13. In 2014, the California State Legislature adopted a comprehensive law governing the use of groundwater in the State, the Sustainable Groundwater Management Act (Water Code Section 10720 et seq.) ( “SGMA”). As noted above, the Orange Cove district lands overlie an easterly portion of the critically overdrafted Kings Sub-Basin 5-22.08. Under the provisions of SGMA, authorized water agencies within the Sub-Basin, such as Orange Cove, are required to organize and form one or more Groundwater Sustainability Agencies (Water Code Section 10723, et. seq.) by January 2017 for the purpose of developing a Groundwater Sustainability Plan for the Sub-Basin. By January 2020, a Groundwater Sustainability Plan shall be developed

and implemented for the Sub-Basin to meet the sustainability goals established by SGMA. (Water Code Section 10727, et. seq.) Orange Cove, in coordination with other water agencies in the Kings Sub-Basin 5-22.08, is actively participating in local efforts to implement SGMA in order to develop the required Groundwater Sustainability Plan(s) to avoid groundwater conditions that cause an undesirable result, such as a chronic lowering of groundwater levels. Implementation of SGMA may limit the future use and availability of local groundwater within the District. Access to groundwater historically has been necessary to satisfy the crop irrigation requirements of lands farmed in Orange Cove, particularly in years when the surface water supply is inadequate. Future reductions in the availability of local groundwater in Orange Cove will only increase Orange Cove farmers' dependence on delivery of their entitlement (Class 1, 39,200 acre-feet annually) from the San Joaquin River.

14. When Friant Division surface water supplies begin to approach the District's Class 1 entitlement (39,200 acre-feet annually), utilization of local groundwater from the area declines and the local groundwater conditions show improvement and significant recovery (e.g., 1994-1998, 2004-2005, 2010-2011). (Exhibit No. FWA-62)

## **VII. CROPS GROWN IN ORANGE COVE IRRIGATION DISTRICT**

15. The farmland in Orange Cove is nearly totally developed to permanent crops. Typically, the top 5 crops grown in the District are orange/tangerines (78.5%), prunes/plums (4.1%), table grapes (3.6%), lemons/limes (2.9%) and olives (2.9%). Most recently, in 2015 a list of the top 20 crops grown in the District have been summarized. A true and correct copy the table entitled "Orange Cove Irrigation District 2015 Crop Distribution" has been submitted as Exhibit No. FWA-65.

Notably, approximately 10% of all fresh market oranges packed in California are grown in Orange Cove.

### **VIII. EFFORTS TO RESPOND TO FRIANT DIVISION WATER SHORTAGES IN RECENT YEARS**

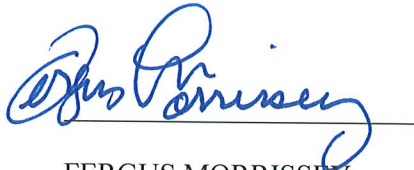
16. In the water year 2014, when the United States made no allocation of San Joaquin River water to Orange Cove, the District implemented a series of unprecedented efforts in an attempt to provide the necessary irrigation water supply to the growers in the District. It delivered all of its 2013 carryover supply (approximately 1,357 acre-feet); entered a short-term banking project with Fresno Irrigation District (approximately 1,183 acre-feet); implemented a transfer of San Joaquin River water from the San Joaquin River Exchange Contractor Water Authority (approximately 4,500 acre-feet); and signed two Warren Act contracts with nearby districts (Kaweah Delta Water Conservation District [1,209 acre-feet] and Fresno Irrigation District [1,000 acre-feet].) In addition, the District made agreements with individual Orange Cove farmers with lands adjacent to the Friant-Kern Canal to pump locally available groundwater into the Friant-Kern Canal to be delivered to lands in the District developed to permanent crops (e.g., orange orchards, etc.) but lacking access to groundwater or other sufficient irrigation water supply. The District also permitted individual Orange Cove farmers with adequate groundwater resources to introduce supplies into the District's conveyance system for delivery to their own lands lacking access to groundwater or to others through arrangements and complicated operational exchanges. For this program, new pipes, flow meters and pressure regulators to control and measure the water going in and out of the system were installed at the participating farms buying or selling groundwater in Orange Cove. Without this



program, farmers who did not have access to groundwater would have lost permanent crops; they were desperate. In regard to this one urgency program, significant additional expenses were incurred by the District growers for pipelines, equipment and distribution infrastructure as well as the required water quality testing (\$4,500 per test for water introduced into the Friant-Kern Canal) to insure compliance with State of California, Title 22 drinking water quality standards. Despite all its efforts in 2014, the District was unable to deliver to its growers a supply sufficient to avert loss. Hundreds of acres of older groves were removed. Some of that acreage was replanted with new trees requiring significantly less water and some was fallowed. Farmers in the District also implemented and experimented with deficit irrigation techniques and practices (coming from Australia's experience with its Millennial Drought) in order to keep trees alive or in an attempt to salvage a crop with experimental irrigation deficit and strategic timing.

17. In the water year 2015, the United States once again made no allocation of San Joaquin River water to Orange Cove. Just as in 2014, the District was unable to deliver sufficient water to satisfy the irrigation demand of all the farms developed to irrigation in Orange Cove, despite implementing all of the general aforementioned practices it conducted in 2014. Similar impacts were experienced in 2015, with more groves removed. As in 2014, immediate financial impact hit growers who had no choice but to protect their investment, paying in the order of \$1,500 per acre foot for supply compared to the typical (normal water supply year) cost of about \$100 per acre-foot.

Respectfully submitted,



FERGUS MORRISSEY