

**Written Statement of**  
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**General Manager**  
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**“California’s Sacramento-San Joaquin Delta: Planning and Preparing  
for Hazards and Disasters”**

**Before the**

**House Committee on Transportation and Infrastructure, Subcommittee  
of Economic Development, Public Buildings, and Emergency  
Management  
U.S. House of Representatives**

**Congressional Hearing - Stockton, California  
August 16, 2012**

## August 16, 2012 Testimony

**Mr. Alexander R. Coate, General Manager of the East Bay Municipal Utility District**

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### INTRODUCTION

Chairman Denham and members of the Subcommittee, I am Alexander Coate, General Manager for the East Bay Municipal Utility District (EBMUD). I am pleased to appear before the Subcommittee today on behalf of EBMUD. We are grateful for the opportunity to testify on the important issue of how federal policies are vital to comprehensive planning for, and responding to, disasters in the Delta.

As an agency with significant infrastructure at risk within this region, we have learned some important lessons on emergency preparedness and we believe these lessons can help inform future discussions.

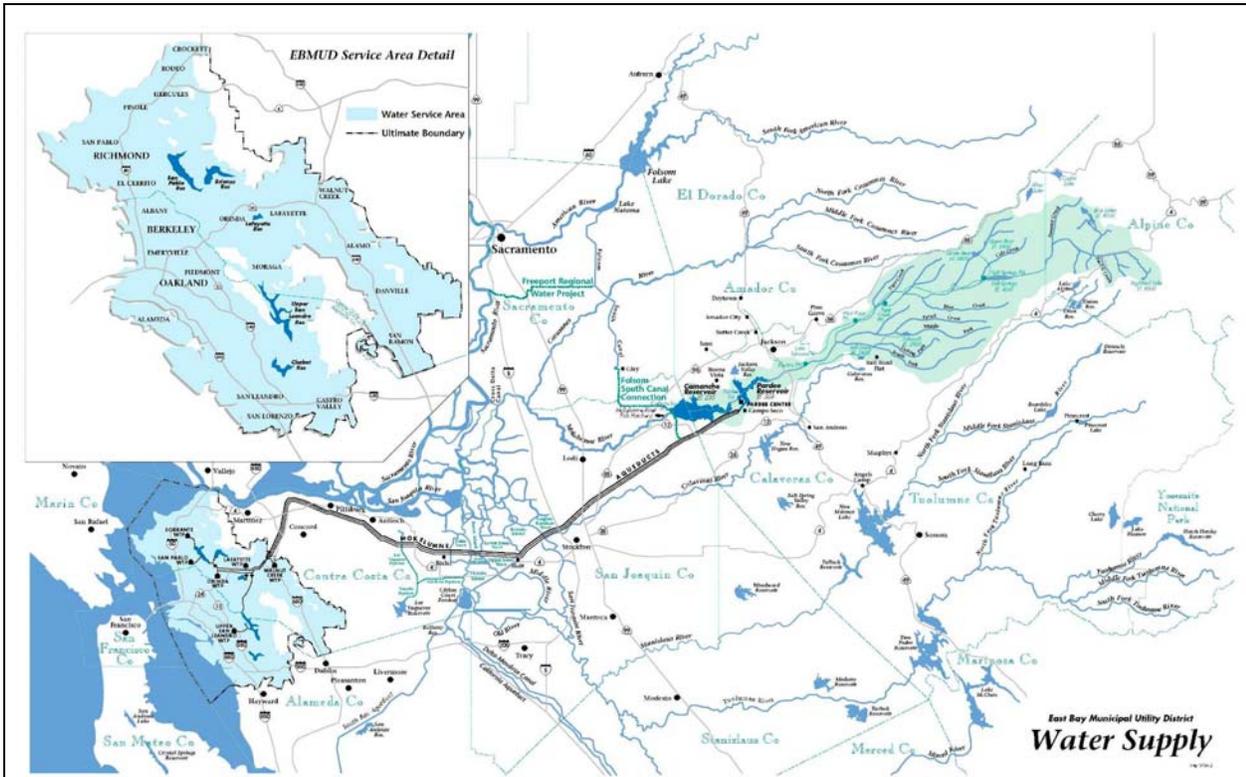
I would like to start by providing some background. EBMUD is a regional water and wastewater agency located in the East San Francisco Bay Area. We provide drinking water to 1.3 million residents in a service area that encompasses 20 cities and 15 unincorporated communities in Alameda and Contra Costa Counties. We also provide wastewater treatment services to 650,000 residents in a portion of our drinking water service area.

Over 90% of our drinking water comes from the Sierra foothills, about 90 miles east of our service area. We own and operate the Mokelumne Aqueducts. This system conveys the primary water supply from EBMUD’s Pardee Reservoir, located in Calaveras and Amador Counties, across the Sacramento-San Joaquin Delta and ultimately into Contra Costa and Alameda Counties. These aqueducts are also used to carry supplemental supplies from the Freeport Regional Water Project to EBMUD’s service area in times of drought. EBMUD built and operates the Freeport Project in partnership with the County of Sacramento. During these extremely austere budget times, I am particularly proud that this project was constructed using local revenues and is a symbol of what can be achieved through collaboration among stakeholders.

### THE MOKELUMNE AQUEDUCTS

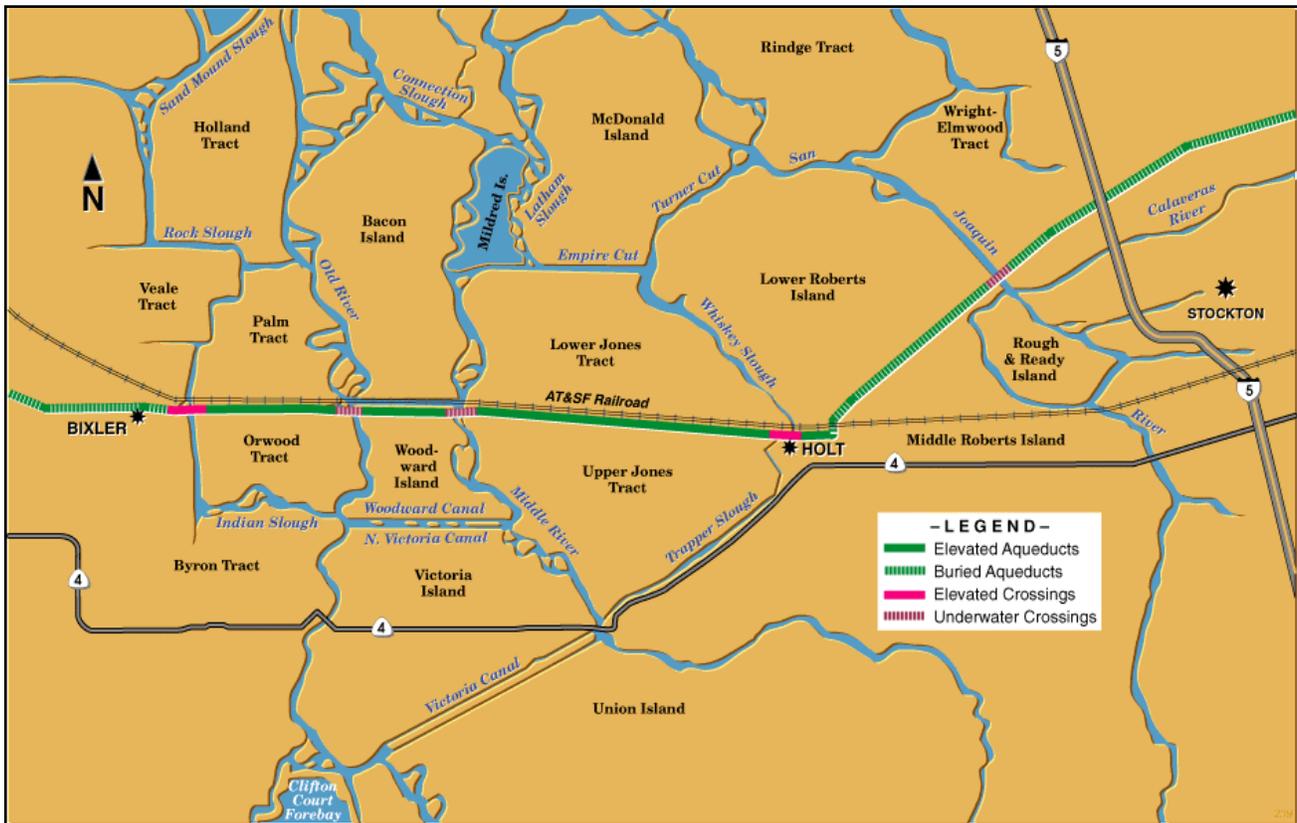
The Mokelumne Aqueducts are the lifeline of our communities’ economies and public health. The aqueducts are a vital piece of infrastructure that must be addressed in any state and national effort to protect the Delta. EBMUD has interconnections with the San Francisco Public Utilities Commission, the Contra Costa Water District, and the Dublin San Ramon Services District, making the aqueducts a linchpin in an increasingly integrated regional water system.

The interconnections offer us the flexibility to maximize the various elements of our region’s infrastructure in the event of an emergency. Fortunately we have not had to employ this strategy but if required we are prepared to provide water to nearly 6 million people and area businesses. These aqueducts are critical infrastructure that provide a substantial regional public benefit that extends far beyond EBMUD’s service area and its ratepayers.



**FIGURE 1 – EBMUD’s WATER SUPPLY SYSTEM**

The Mokelumne Aqueducts were constructed in the 1920s, 1940s, and 1960s and consist of three steel pipes ranging in diameter from 65 to 87-inches. They cross over five Delta islands for about a 15-mile stretch in the central Delta. All of these Delta islands are below sea level – some as much as 15-20 feet - and are protected by earthen levees that must continuously hold back the Delta waters. EBMUD shares with operators of other infrastructure, including the users of the state and federal water projects, a heavy reliance on the integrity of the existing levee system to maintain water deliveries and other critical services. The replacement cost of the aqueducts is currently estimated to be \$1.7 billion.



**FIGURE 2 – EBMUD’S MOKELUMNE AQUEDUCTS CROSSING THE DELTA**

EBMUD’s aqueducts are protected by 51 miles of levees that surround five Delta Islands. These levees are relied upon by multiple other beneficiaries, including: state and federal export pumps; Contra Costa Water District intakes; State Highway 4; Kinder Morgan petroleum pipeline; PG&E pipelines; Burlington Northern Santa Fe (BNSF) Railway line; agricultural lands; and recreational users.

**LEVEE FAILURE**

We have first-hand knowledge of dealing with an emergency in the Delta. The levees protecting the Mokelumne aqueducts have failed three times – in 1980, in 1986, and most recently in 2004. Each time the levees failed, our aqueducts were at risk of significant damage that could have resulted in an interruption of the water to the East Bay. These aqueducts were not designed to function submerged or to withstand tidal action and floating debris. Any breach of the aqueducts would leave the East Bay region with at most six months of water supply assuming severe rationing. This rationing would result in serious negative economic impacts throughout the region.

Failure of one of the levees surrounding EBMUD’s aqueducts, and the resulting flooding of one of the islands, would in turn stress adjacent islands, and could result in progressive failures of surrounding levees. This would threaten critical facilities in the area, including the Mokelumne aqueducts, Kinder Morgan petroleum pipeline, BNSF rail line, and State Highway 4. Any damage to the levees may also result in adverse impacts to the Old and Middle Rivers that route water to the State Water Project at the Clifton Court Forebay. It would also potentially affect the ecosystems in the Delta, degrading water quality and compromising the water supply to over twenty million people and hundreds of farms south of the Delta who rely on this water supply. The statewide financial impact of this would be huge.

The reality of this threat became apparent again several years ago. On a perfectly beautiful day on June 3, 2004, the Upper Jones Tract levee along Middle River unexpectedly, and without any prior indication, failed. The failure took place during late spring without either a flood or an earthquake as a precipitating event. This levee is one of many in the Delta that holds back water every day from the adjoining below-sea-level farmland and protects important infrastructure.

In the weeks and months that followed, local, state, and federal agencies carried out extensive and complex flood-fighting operations to prevent the failure from cascading to other Delta islands. Extensive efforts were made to close the breach in the levee, pump out the flood waters, and reduce seepage through the breach closure. A 2008 report by the Public Policy Institute of California<sup>1</sup> estimates the cost for the flood fight, levee repair, and island pumping at \$30 million with an additional \$60 million in damages for a total estimated cost of \$90 million for this single levee failure.

EBMUD's aqueducts, the lifeline of our water supply system, were threatened to within feet when massive debris surged toward our aqueducts. Fortunately our aqueducts continued to operate though it cost \$10 million to recoat them once the flood waters were pumped out. If the response actions had been unsuccessful in preventing contact with the aqueducts, a most certain rupture would have occurred, taking with it the main source of water for our region and resulting in significant public health and economic impacts.



***FIGURE 3 – INUNDATED AQUEDUCTS WITH FLOATING RAIL CAR VISIBLE (1980)***

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<sup>1</sup> Public Policy Institute “Levee Decisions and Sustainability for the Delta, Technical Appendix B,” Comparing Futures for the Sacramento-San Joaquin Delta, 2008



*FIGURE 4 –INUNDATED AQUEDUCTS WITH RECOVERY WORK IN PROGRESS (2004)*

## LESSONS LEARNED

I highlight this event because it provides a case history of the real consequences that can result from indecision and inadequate policy and collaboration among all levels of government.

The key lesson that we learned is the importance of having an emergency action plan that includes a commitment by the various agencies with resources and funding to respond in a coordinated manner. In this case, first responders like EBMUD quickly depleted available resources and were forced to stand by until additional resources were made available. Response times were delayed because field staff were not empowered to act.

It is our experience that the lowest level of command is the staff on the scene. Due to their proximity to the emergency these are the people who have the best information, are able to assess the situation quickly, and act decisively and with appropriate actions. However, in past emergencies, staff has not had the authority to respond. The absence of advance funding posed a secondary and serious challenge to mitigating threats. As a result, response was delayed due to the need for field staff to transfer information to the decision-makers at higher levels of command and wait for authorization to act. This “decision bottleneck” created unnecessary delays that further exacerbated the damage and extended the repair time.

An effective response plan should commit state and federal agencies to respond, clearly define roles and responsibilities, and provide the needed advance funding. Because the consequences of delaying action after a levee break can be catastrophic, the extent of the federal and state commitment to respond and repair a levee breach should be known and communicated in advance as part of basic emergency preparedness so that local agency staff is empowered to respond. The development of a

coordinated response plan that clearly describes the roles and expectations of the state and federal governments to respond to a levee failure means delays will be minimized and the economic consequences from such events could be greatly reduced.

### EBMUD'S INVESTMENTS IN PREPAREDNESS

We know from experience that the threat of future failures in the Delta is real. In addition to the three failures of levees that protect our aqueducts, levees in the Delta have been breached approximately 160 times over the last century. The threat of more levee failures, potentially on a system-wide scale similar to the Katrina-New Orleans event, is increasing over time due to island subsidence, sea level rise, intensified flood events, and seismic faults in and near the Delta. Scientists estimate a two-in-three chance of a major quake in the Delta during the next 50 years, potentially leading to permanent changes in the landscape of the Delta.

However, the story does not stop at the Delta. Our emergency planning must not only protect infrastructure, it must also ensure the continued integrity, resiliency, and reliability of our water supply system. EBMUD has invested tens of millions of dollars to protect our aqueducts in the Delta. We have also spent many years and made a tremendous investment in developing and implementing programs to diversify and bolster our water supply and improve the resiliency of our infrastructure system-wide. Here are a few examples:

#### Levee improvements

EBMUD is the only entity located outside of the Delta that provides significant annual contributions for the improvement of Delta levees. Since the early 1980's, EBMUD has voluntarily contributed a total of almost \$15 million towards levee repairs and improvements on the five Delta islands that protect the Mokelumne Aqueducts. Levee improvements have included raising the crest to at least one foot above the 100-year flood level, widening the crest, reducing levee slopes, and adding riprap for wave protection. However, these levees continue to settle and subside, and have failed three times over the past sixty years. Levee improvements are necessary to protect the region's agricultural, cultural, and historical resources, as well as protect the water supply to over twenty million people.

We recently supported the reclamation districts that maintain the 51 miles of levees that protect our aqueduct. We worked with the State of California to allocate \$33.5 million in state funding to make improvements to more than 40 miles of levees. EBMUD and the reclamation districts entered an agreement so the reclamation districts could accept the Department of Water Resources (DWR) funding and implement the projects. EBMUD agreed to pay the 15 percent local share which totals \$6 million.

#### Seismic retrofit of aqueducts

EBMUD has invested \$40 million in ratepayer funds to retrofit its aqueducts to improve their ability to withstand a maximum credible seismic event.

#### Aqueduct interties

At a cost of \$14 million, EBMUD is constructing interconnections to our three Mokelumne Aqueducts on each side of the Delta. This will allow EBMUD to restore 77 percent of the raw water system capacity with only one pipe in operation across the Delta. EBMUD has six months of storage locally to serve its customers during an outage of the raw water system resulting from a failure in the Delta. This will bolster the resilience of our water supply system by enabling a rapid return to service after a failure with sufficient capacity to meet customer needs and begin to recover local storage. This will

greatly lessen the consequence of a failure and could prevent what could otherwise be much more severe and economically damaging rationing.

#### Interconnections with other water systems

EBMUD has interconnections with the San Francisco Public Utilities Commission, the Contra Costa Water District, and the Dublin San Ramon Services District making the aqueducts a linchpin in an increasingly integrated regional water system. These interconnections increase the reliability of the water supply for EBMUD as well as other agencies in the region and allows for optimizing existing supplies. We are also exploring adding additional interconnections to our system to further enhance the water supply reliability for EBMUD's ratepayers the entire region.

#### Standby materials

A levee failure requires significant materials be available for the repair work to recover the aqueducts. EBMUD is planning for the placement of standby materials and supplies in key locations to facilitate emergency response. We estimate that stockpiling material to repair levees and to access the aqueducts, and purchasing the pipe for repair/replacement of failed aqueducts, would cost about \$10 million.

#### Water supply diversification

EBMUD currently provides over 9 million gallons of recycled water per day to its customers for irrigation, commercial and industrial uses through its Integrated Recycled Water Management Program, the San Ramon Valley Recycled Water Project, the North Richmond Water Reclamation Plant, and various smaller projects. EBMUD has plans to increase recycled water use by an additional 11 million gallons per day by 2040<sup>2</sup>.

EBMUD began its water conservation program in the 1970s and was one of the first agencies to prepare and implement a water conservation master plan in 1994. Since 1994, the water conserved by EBMUD customers has increased by an estimated 26 million gallons of water per day with plans to increase this by an additional 36 million gallons per day by 2040<sup>3</sup>.

EBMUD is also pursuing additional supplies via conjunctive use and desalination projects that are currently in various phases of planning and development.

#### Collaborative efforts

As I mentioned earlier, EBMUD worked collaboratively with five local reclamation districts to obtain \$33.5 million in state funds for levee strengthening and provided the \$6 million local cost share. These projects required collaboration with the Department of Water Resources, the Department of Fish and Game, the Delta Stewardship Council, and other resource agencies to secure the funding needed for levee projects to protect critical infrastructure and ecosystems in the Delta.

In a separate effort, EBMUD and six other water agencies are working together to identify those levee projects that are of high priority for enhancing the water supply reliability for the Bay Area and Southern California. This coalition has approached the state for assistance in identifying a source to fund the \$163 million needed to complete the projects that have been identified. Our collaborative efforts continue.

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<sup>2</sup> East Bay Municipal Utility District, "Water Supply Management Program," Final, April 2012

<sup>3</sup> East Bay Municipal Utility District, "Water Conservation Master Plan Update," 2011.

## MITIGATING THE EFFECTS OF FUTURE DISASTERS

EBMUD has invested a tremendous amount of money and resources into emergency preparedness. The benefit of our investment extends far beyond our ratepayers. It extends to those agencies with which we have cross-connections, to those with infrastructure in the Delta, as well as to the state and federal government who have water supply and other infrastructure in the Delta.

Despite the tremendous amount of work that we and our sister agencies have done to prepare for emergencies, much more could be done if additional resources were available. Emergency preparedness requires a significant commitment of capital. This commitment competes against the funding needed to maintain our system under normal operating conditions. However, I would emphasize that these costs pale in comparison to resource demand to respond and recover after a disaster. The ability to direct federal assistance to “disaster-proof” our systems through the diversification of supplies and improvements to infrastructure can reduce short, medium, and long-term costs responding to and recovering from an actual crisis, and can avert the collateral economic devastation that is inevitable following a disaster.

We hope that when your committee renews the Water Resources Development Act (WRDA) that you give careful consideration to the approaches we implemented. We recommend that a federal program to assist us in such efforts be authorized. We urge you to view emergency preparedness in the broadest sense. It must include not only those things traditionally associated with emergency preparedness, such as levee strengthening and material stockpiling, but also efforts to diversify water supplies (e.g. recycling and desalination), increase the reliability of those water supplies (e.g. inter and intra-system connections), and bolster infrastructure (e.g. seismic upgrades). WRDA funding has been integral in helping us develop alternative water supplies through recycling. We view WRDA as an important vehicle moving forward to develop effective federal policy to support local emergency preparedness efforts.

In addition to authorizing and appropriating federal resources, we believe a coordinated state and federal response plan is vital to ensure an effective and efficient rapid emergency response capability. To the extent possible, the plan should empower field staff so that response efforts can be immediate. In addition, consideration of levee improvement funding to meet U.S. Army Corp. of Engineers PL84-99 Standard to reduce the risk of failures and funding for stockpiling emergency response materials is recommended.

## CLOSING

Mr. Chairman and members of the subcommittee, this concludes my formal testimony. I would be pleased to answer any questions you may have. On behalf of the East Bay Municipal Utility District, thank you for the opportunity to discuss this important matter and we look forward to working with you and your colleagues as you continue to examine emergency preparedness in the Delta.