Long Beach Water Department
The Standard in Water Conservation & Environmental Stewardship

Testimony of:

Mr. Kevin L. Wattier
General Manager
Long Beach Water Department

Before the Natural Resources Subcommittee on Water and Power
United States House of Representatives
Hearing on H.R. 745 – Reauthorization of the Desalination Act of 1996
May 23, 2013

Mr. Chairman and members of the committee, thank you for the opportunity to speak before you today on this important topic. I especially want to thank Congresswoman Napolitano for introducing this legislation and for being a continued leader on the many water resources issues that affect our nation.

My name is Kevin Wattier and I am the General Manager of the Long Beach Water Department, a southern California municipal water supply agency that provides drinking water to nearly half a million residents. I am a licensed Professional Engineer in the state of California and a Grade 5 Water Treatment Operator with 35 years of water industry experience.

For many years, my organization has striven to implement and manage a diverse water supply portfolio, believing this to be the most effective strategy for mitigating variable constraints inherent with imported water supplies. Recently, imported water has become increasingly unreliable in the western United States due to various factors such as the depletion of statewide water supply reserves, frequent droughts and severe water supply constrictions in critical areas such as the Colorado River watershed and California's Sacramento-San Joaquin Delta. Scientists are also predicting with increasing frequency that climate change will add a new layer of stress on these critical water supply sources in the future.

To address these realities many water suppliers have begun taking multi-faceted approaches to reducing their reliance on imported water. In Long Beach, we have implemented one of the most aggressive water conservation programs in the nation, expanded our recycled water distribution system to many areas of the city and maximized utilization of the groundwater basin we overlie through conjunctive use and other beneficial projects. These measures all serve to strengthen the overall reliability of our water supplies, while keeping water rates to our customers competitively low.

In the United States, another source of water that is widely known, yet not as well understood is seawater desalination. Utilized around the world for thousands of years, desalinated seawater holds promise as an alternative source of water for many areas of the country that are facing ongoing water supply challenges.

According to the National Oceanic and Atmospheric Administration's 2010 National Coastal Population Report, more than 123 million Americans, or approximately 40 percent of the nation's population live in counties that are directly situated on one of the country's coastlines. This figure is expected to increase eight percent by the year 2020, meaning an additional 10 million people are predicted to move into these coast-adjacent localities. With these numbers in mind, it is no wonder that seawater desalination is so frequently mentioned as one of several potential solutions for strengthening the reliability of the nation's water supply.

To that end, for over a decade now, my agency has partnered with the United States Bureau of Reclamation to conduct advanced seawater desalination research and development activities at three separate facilities in the City of Long Beach. The Long Beach Desalination Project represents one piece of the Federal government's investment in seawater desalination research and development.

From the outset, this major research undertaking was aimed at fulfilling the intent of Congress, put forth by this Committee in its 1996 funding authorization for the Long Beach Desalination Project, to reduce the cost of seawater desalination through advancements in technology. Our project has also been carried out in accordance with recommendations contained in the Bureau of Reclamation's Water 2025 Roadmap, concerning Federal investment in seawater desalination.

I believe it's safe to say the investment made in our project has paid off in multiple ways. After years of dedicated research made possible by ongoing support from the Federal government, my staff, in conjunction with our partners has been able to successfully develop technologies and processes proven to reduce the energy requirements and environmental impacts involved with desalting water. With that said, allow me to step back and provide you with a brief overview of our experience with studying seawater desalination as a viable alternative source of water.

Our efforts to improve the seawater desalination process began in earnest in 2001, when we constructed a 9,000 gallon-per-day seawater desalination pilot project. The research conducted at this site showed a significant reduction in the overall energy requirement of seawater desalination using a relatively low-pressure, two-pass nanofiltration process, which has come to be known as the Long Beach Method. Testing at this facility suggested this new technology to be 20 to 30 percent more energy efficient than reverse osmosis. Since energy is the primary cost driver of the seawater desalination process, our research was

providing an immediate and tangible return on the investment made by the federal government.

In 2005, we expanded our research by commencing operations on a full-scale desalination facility capable of treating 300,000 gallons of seawater per day. Development of this research facility was again made possible our partners at the Bureau of Reclamation and by generous assistance from the Los Angeles Department of Water & Power.

At the time, this was the nation's largest and most technologically advanced federally authorized facility of its kind. The larger scope of operations afforded us greater flexibility to test and refine several new technologies and processes aimed at further reducing the energy and cost requirements normally associated with reverse osmosis desalination methods.

Among the research conducted at this facility was a full-scale, side-by-side comparison of the two-pass nanofiltration and single-pass reverse osmosis methods of desalination, which at the time was the only full-size, energy-use comparison of these two processes being conducted in the United States. The project analyzed many of the newest Energy Recovery Devices being made available in the market and studied other factors involved with operating a full-scale desalination project, including infrastructure corrosion, temperature control, chemical delivery methods, and others.

The results of the research conducted at this facility further strengthened and confirmed the energy savings that were achieved through our pilot project, solidifying our beliefs that new methods can be developed and implemented to reduce the costs involved with turning seawater into a high quality drinking water source. With the data we gathered, we were able to verify energy savings of the two-pass nanofiltration method, and optimize the process so that it can be easily duplicated by others.

In 2008, we constructed the final phase of our seawater desalination research project. Somewhat different from our previous research, this phase of study would focus on optimizing the seawater intake and discharge process, a major component of any desalination facility.

The Under Ocean Floor Intake and Discharge Demonstration System is a unique and valuable project that is among the first of its kind in the world. Designed to mitigate the various environmental impacts associated with traditional open ocean intakes, we believe this project has demonstrated the feasibility of an alternative, environmentally responsive method of seawater intake and brine discharge using slow sand filtration, utilizing existing beach sand under the ocean floor as a viable pre-treatment method for seawater desalination. Research at this facility is expected occur for several more years, allowing us to

continue exploring methods to optimize the seawater intake and discharge process.

Now that you have a better idea of the technological breakthroughs and process improvements that our federally funded research was able to yield, I want to impart upon you how important it is that the Federal government continue to support and promote public and local efforts like ours to further develop and refine desalination technologies and methods. While our research has proven that seawater desalination can be done with less energy and at a lower cost to the environment, there are undoubtedly other aspects of seawater and brackish water desalination that can be further studied and improved.

Federal support for desalination research is not something that should be reserved strictly for private industry. By its very nature, public research is done in a transparent and open manner that makes it well suited for fostering innovation and knowledge sharing on important topics that affect our nation.

All of the valuable data that has been produced through our research over the past twelve years is widely available to the public for further study, analysis and refinement. My colleagues and I have shared this information at dozens of technology and water industry conferences throughout the nation to thousands of engineers, scientists and other professionals. We have also published our various reports and presentations and made them available on our public website for anyone who wishes to learn more about our research.

Public research on desalination can also be accomplished in a way that maximizes cooperation and partnerships with others. Using the Long Beach desalination project as an example, in addition to the support we received from the Bureau of Reclamation and the Los Angeles Department of Water and Power, we also teamed up with researchers at the University of California at Los Angeles (UCLA) to provide additional focused analysis and modeling for the project. UCLA's researchers supported our efforts by providing primary involvement in bench-scale membrane evaluations, theoretical model development, data modeling, and optimization studies to increase understanding of potential cost savings and water quality benefits of the various desalination system configurations that were being evaluated at our facility. Our project undoubtedly benefitted from this partnership.

In my opinion, it would be a mistake to preclude local governments and other public agencies from continuing to play a vital role in making contributions and advancements in the field of desalination research. Public agencies employ countless intelligent and driven individuals who are capable of making valuable scientific contributions that benefit the public. Overlooking this large and accomplished group of strategic thinkers and doers by withholding future support for public research projects like ours would really be doing a disservice to the public.

Doing so at a time when severe water shortages in our country are becoming the norm instead of the exception could slow the positive progress that has been achieved in desalination research in recent years. This makes it even more critical that existing federal programs are maintained to encourage and support public efforts to develop and implement new advancements that reduce the costs and impacts of desalination operations.

When you consider that the majority of future desalination projects will involve local government organizations or water supply agencies, it makes sense that these same interests should continue to have the opportunity to receive support from the Federal government to carry out research and development activities that stand to improve the water supply reliability of their communities and those communities of the country at large. Honestly, who better to conduct practical desalination research projects than the organizations that will someday be responsible for operating these types of facilities?

We strongly believe that the operations conducted here over the last decade, focused on optimizing promising new membrane processes and designs, analyzing and perfecting energy requirements and recovery methods, and honing water quality controls and distribution system integration methods, will provide this region, the state of California and our nation with tangible new methodologies that will help reduce costs and improve the environmental responsiveness of future seawater desalination facilities.

Further, we believe our work will complement other similar work being done in other parts of the country by our colleagues in the water supply industry. The specific advancements and breakthroughs we were able to develop and share with the rest of the country through our partnership with the Bureau of Reclamation and made possible by the financial backing by Congress should validate the need for these programs continue into the future.

Mr. Chairman, I would like to thank this Committee, The Congress and the Bureau of Reclamation for your continued partnerships with Long Beach to advance the field of seawater desalination. We look forward to continuing to share our research with this Committee and all other stakeholders who would stand to benefit from it.

I will be happy to answer any questions you might have.

Thank you.