Watereuse Association

Testimony

The Importance of Water Reuse in

the 21st Century

Mr. Michael Gritzuk, P.E.

Vice President - WateReuse Association

Director - Water Services Department - Phoenix, AZ

March 27, 2003

Introduction

Mr. Chairman and members of the Subcommittee, the WateReuse Association is pleased to have the opportunity to present this testimony on the importance and role of water reuse in ensuring an adequate water supply for the nation in the 21st century. I am Mike Gritzuk, Vice President of the WateReuse Association, and I am representing the Association today. I am also Director of the Water Services Department of the City of Phoenix. On behalf of the Association's Board of Directors, I want to commend you, Mr. Chairman, for convening this hearing. The hearing is especially timely, given the numerous and increasing number of challenges facing local agencies in their continuing quest to ensure future sources of water supply.

As a way of introduction, the WateReuse Association is a national organization whose mission is to increase the amount of high-quality water available to communities and the environment by promoting increased reclamation, recycling, and reuse ("reuse"). One of the Association's primary goals is to assist our members in implementing water reuse projects that yield valuable benefits to their communities. We accomplish this overarching goal by encouraging more Federal, state and local involvement in water reuse efforts such as sponsoring research that demonstrates to the public that reclaimed water is a safe and reliable water resource, engaging in outreach services to provide information to the public about the safety and benefits of recycled water, and in funding partnerships.

WateReuse has been especially effective in California - where the Association began - in successfully eliminating barriers to reuse and in securing grant and loan funding for local agencies to build projects and conduct research. For example, the Association was instrumental in getting legislation enacted in 2001 that established the Department of Water Resources (DWR) Water Recycling Task Force, which is directed to advise DWR on opportunities for using recycled water in industrial and commercial applications and in identifying impediments and constraints to increasing the industrial and commercial use of recycled water in California.

The Association has grown rapidly since it became a national organization three years ago. WateReuse now has more than 270 members nationwide, including more than 125 local water and wastewater agencies in six states. One of the reasons the Association has been effective is due to its diverse membership which, in addition to local agencies, includes state and Federal government agencies, consultants, equipment suppliers, and prominent researchers from the academic community.

The Association also has a long-standing and productive working relationship with the U.S. Bureau of Reclamation (USBR) and its Title XVI program. WateReuse testified on behalf of the original legislation that

created this important funding program in 1992 and also actively supported the updated legislation in 1996. We have worked closely with USBR in the development of Title XVI guidelines (i.e., Guidelines for Preparing, Reviewing, and Processing Water Reclamation and Reuse Project Proposals Under Title XVI of Public Law 102-575, As Amended) and the overall implementation of the program to date.

The Association has also been successful in developing a cost-shared research program with the USBR and other research organizations through its WateReuse Foundation. The Foundation is engaged in conducting "leading edge" applied research on important and timely issues, including: 1) evaluating ways to advance public acceptance of indirect potable reuse; 2) evaluating methods for managing salinity, including the disposal of concentrates from membrane treatment systems; and 3) understanding the occurrence and fate of emerging contaminants, such as endocrine disrupting compounds, in conventional and advanced water recycling systems.

Conducting research on these issues is particularly important to cities such as those in the Phoenix metropolitan area. In the semiarid Southwest, the only new available source of water is reclaimed water. To use reclaimed water for both non-potable and indirect potable applications, the public must be convinced of the safety and efficacy of this approach. Although much research has already been conducted regarding the safety of water recycling, new contaminants and concerns emerge as analytical capabilities advance. Often a "pollutant dejour" is discovered in water or wastewater before the science explaining its significance is completed. Thus, our research efforts related to water reuse must keep up with the latest science so that we can continue to demonstrate to the public that recycled water is chemically and microbiologically safe - and the only way to accomplish that worthwhile goal is through research.

Current Status of Water Reuse in the U.S.

The practice of recycling water in the U.S. is a large and growing industry. An estimated 1.7 billion gallons per day (bgd) is reused daily in the U.S. Recycled water use on a volume basis is growing at an estimated 15% per year. In 2002, Florida reclaimed 584 mgd of its wastewater and California ranked a close second with an estimated total of 525 mgd of recycled water per day. Florida has an official goal of reclaiming one billion gallons per day by the year 2010. California, likewise, has a statutory goal of a doubling of current beneficial use by 2010. Texas currently reuses approximately 230 mgd while Arizona reuses an estimated 200 mgd. This is but a small fraction (4.87%) of the total volume of wastewater generated - 34.9 billion gallons per day - according to EPA's soon to be released 2000 Clean Water Needs Survey. Hence, the future potential for reclaiming treated wastewater is enormous.

While four states -- Arizona, California, Florida, and Texas -- accounted for an estimated 91% of all recycled water in 1995 (source: USGS), several other states have growing programs, including Nevada, Colorado, Georgia, North Carolina, Virginia, and Washington. At least 27 states now have planned recycled facilities and the overwhelming majority of states have regulations dealing with water reuse.

There is a long history of water reuse throughout the country, encompassing a wide variety of applications including landscape and agricultural irrigation, industrial processing, power plant cooling, and groundwater replenishment. There are numerous examples of water reuse success stories, dating from the 1950s. Some of the best known facilities and programs are described in Appendix A. To document the extent of water reuse in the U.S., the Association and the WateReuse Foundation are currently developing a national database of all reuse facilities. We would be pleased to make this information available to the Subcommittee once the project has been completed.

Importance and Benefits of Water Reuse

A growing body of evidence suggests that water reclamation and reuse will play an expanded role in water management in the 21st century, not only in the semiarid western states and "sunbelt" states, but perhaps in all 50 states. There are at least five good reasons why this is true:

- Populations are growing rapidly in states such as Nevada, Arizona, California, Texas, and Florida;
- There are no readily available sources of new water supplies in many geographic areas;
- Reuse meets the needs of industrial uses for non-potable supply and solving environmental discharge problems;
- Drought events such as the one experienced by more than half the country in 2002 debilitate available sources; and
- Alternative sources of supply such as desalination are currently, in most cases, more expensive than

water reuse.

While all five factors are driving the growth of water reuse, perhaps none is as important as population growth. In a recent Awwa Research Foundation (AwwaRF) study to assess the future of water utilities, AwwaRF cited a U.S. Bureau of Census projection that predicted the U.S. population would double by 2100 using moderate fertility, immigration and longevity assumptions. The same projections quadruple using aggressive assumptions. State estimates support these projections. California's population is growing at a rate of 700,000 per year which means that the state's population will reach 50 million by 2020. Florida's population will increase from 14.2 million to 20 million by 2020. The population of Texas is increasing by 3000 people per day and is expected to increase from its current level of 20 million to approximately 50 million by 2050. Nevada and Arizona are the two fastest growing states in the country, according to the 2000 U.S. Census.

Long-term water projections in states such as Texas show that demand will exceed supply by the year 2020. Major rivers in the West such as the Colorado and Rio Grande have allocations that greatly exceed supply. The only dependable, controllable, and reliable supply of water in several fast growing cities such as Phoenix, Tucson, and El Paso is recycled water. Denver, Salt Lake City, Albuquerque, Las Vegas, Phoenix, Tucson, and Southern California depend heavily on water imported from the Colorado River to satisfy growing demands; this fast growing area is exploring various options, including water reuse and desalination, to keep up with demand. These hard facts suggest, as many knowledgeable observers routinely predict, that the U.S. will be facing a population-based water crisis, perhaps as early as 2015. If these projections take into account the impacts of localized droughts, then the crisis is already occurring in many parts of the country.

Think of how important water is to the nation's economy. A good example of the importance of water to industrial production can be illustrated by the requirements of Silicon Valley. The South Bay Water Recycling Project in San Jose, CA produces recycled water that provides benefits to 1.3 million area residents. By reusing this water instead of releasing it to the Bay, San Jose has avoided the imposition of a sewer moratorium that would put the brakes on the Silicon Valley economy-- an economy which is one of the nation's largest in the development and export of computer hardware and software. It takes 10 gallons of water to make one microchip, and larger manufacturers in Silicon Valley require over a million gallons of water each day.

This one example, of many which could be cited, serves to underscore a statement which you made in early 2001, Mr. Chairman, and one with which the Association strongly agrees. Referencing the energy crisis of a couple of years ago, you said, "Without adequate water supplies, the power crisis of today will become our water crisis of tomorrow."

Water reuse is one of few alternative sources of supply that represents a viable, long-term solution to the challenges presented by growing municipal, industrial, and agricultural demands for water. Reclaimed water has numerous benefits, including the following:

- produces a reliable water supply;
- produces a sustainable supply of water to offset the need to find or develop alternative sources of drinking water supplies;
- uses much less energy than importing water;
- provides local control;
- avoids construction impacts;
- enhances water quality;
- costs less than ocean desalination;
- protects sensitive habitats; and
- reduces the quantity of treated wastewater discharged to sensitive or impaired surface waters.

Technologies, Costs, and Applications

Technologies employed to treat recycled water depend almost entirely on the application, or the "highest treatment for the highest use." As in Title 22, of the California Code of Regulations, bacteriological water quality standards are established based on the expected degree of public contact with recycled water. For example, if the primary application is landscape irrigation or cooling tower water, sand or duel media filtration and disinfection after secondary treatment is sufficient to achieve California's standards. If, on the other hand, the intended application is injection of reclaimed water into groundwater aquifers, advanced

technologies such as microfiltration, reverse osmosis (RO), and ultraviolet irradiation must be employed to ensure chemical and microbiological safety of the reclaimed water.

The capital and operation and maintenance (O&M) costs of water recycling treatments depend on several factors including: the technologies employed, which will be dictated by the application; applicable regulations; and customer needs. The costs are lowest for reclaiming wastewater effluent for irrigation of non-edible crops such as cotton, grasses, orchards, and vineyards. As the quality of water increases, so do the costs. The good news is that the costs of advance technologies are dropping with improvements and innovations as the result of applied research and increasing use. For example, the cost of RO has dropped over the past 30 years from over $5 per 1000 gallons of water to less that $2 per 1000 gallons. Costs also vary by region of the U.S. due to a number of factors including labor and capital costs.

New technologies supported by applied research are critical to providing safe and reliable treatment for recycling to meet our future urban, industrial, agricultural, and ecosystems demands. Research is needed to provide a scientific basis to use new technologies to facilitate the development of future water supplies using recycled water. New and innovative technologies will need to be developed to address a number of concerns. For example, technologies may need to be developed to cost effectively address trace organic chemicals that have unclear long-term health effects, such as endocrine disrupting and pharmaceutically active compounds, and newly identified pathogenic microorganisms.

The Federal Role in Water Reuse

In the opinion of our Association, the Federal government must not only be a key player, but must adopt a leadership role in promoting water reclamation and reuse, water use efficiency, and conservation. If the appropriate Federal role is identified now and appropriate actions are taken, it may be possible to delay or avoid the coming water crisis.

There are numerous ways in which the leadership role of the Federal government could manifest itself. Federal subsidies for local water reuse projects and targeted investment through demonstration grants, as well as tax incentives, could be used to promote reuse practices. The Federal government could mandate increased use of recycled water at Federal facilities (e.g., military bases and new GSA buildings); these could be examples of good stewards of water efficiency and examples of water reuse.

We also believe it is critically important for the Federal government to provide adequate funding for research. One of the many issues faced by water researchers is to understand the meaning and potential health and ecological impacts of thousands of organic compounds that have been identified at trace levels in drinking water and wastewater. The challenge is that analytical methods, which allow identification of emerging chemical contaminants for both drinking water and wastewater, are ahead of the science that allows us to understand what these emerging contaminants mean in terms of protection of public health and the environment, and ultimately what treatment technologies are needed to ensure safe and appropriate water reclamation. The same challenge is true for microbial contaminants. This is not only a water reuse challenge, but one that also applies to every municipality whose source of water supply is a major river or whose groundwater is impacted by septic tanks or the of wastewater via land application. Only through conducting substantial research can local, state, and Federal governments provide proper assurance to the public that both drinking water and reclaimed water are safe.

We believe the first appropriate action for the Federal government would be to establish a multi-agency task force to conduct a government-wide study on reuse issues. Headed by the Council on Environmental Quality (CEQ), this task force would assemble an inventory of Federal agency efforts in the areas of water reuse and recycling, water use efficiency, and conservation. Federal agencies covered would include, but would not be limited to, the Department of Interior's Bureau of Reclamation, the Department of Defense, Department of Energy, Environmental Protection Agency, Department of Agriculture, and the Tennessee Valley Authority.

The Federal task force would produce a report for the President and Congress. In addition to the inventory of current programs, the report would identify opportunities for improving and promoting water use efficiency. The net result of this overall effort would be to increase the visibility and importance of the issue of water reuse and water use efficiency to the nation's future well being.

Title XVI and Proposed FY-2004 USBR Budget Request

Mr. Chairman, I would like to take this opportunity to touch briefly on the USBR's fiscal year 2004 budget request. I understand that decisions on funding levels are a matter for another congressional committee, but I believe the Administration's request for fiscal year 2004 deserves this Subcommittee's attention and involvement. The request upends years of a policy understanding on the role of the Federal government in water reuse and generally in the effort to develop substantial additional water yield, while minimizing disruptions to the nation's ecosystems.

The Administration has requested a total of $12.7 million to support 10 Title XVI projects. This denies any support for authorized projects that have not received funding in the past. In addition, the Administration has stated that other programs that support reuse technologies such as research are to be redirected to desalination program needs. We believe that desalination - like water reuse - has an important and vital role to play in ensuring adequate water supplies in the future. However, the Administration's budget abandons a decade old commitment to a balanced approach to developing new water supplies. This is exacerbated by the Administration's decision to seek $9 million in new program assistance for desalination efforts at the expense of ongoing reuse projects. Simply put, if these resources were equitably distributed, we would see new water reuse projects becoming operational in a timely manner. Instead, the decision to reduce funding commitments for reuse and to shift resources into desalination research means extended construction schedules, leading to more expensive projects because of the delays attributable to this decision. If Congress decides to reverse this attempt to eliminate the Federal-local partnership, the dividends will be realized in the production of new supplemental water supplies that are safe, reliable, and impervious to droughts.

Equally troubling is the direction the Administration is pursuing on water reuse policy. Many of the members of this Subcommittee may be aware of the innovative budget and program review tool contained in the fiscal year 2004 request. This tool, referred to as the Program Assessment Review Tool (PART), was used by the Office of Management and Budget. It seeks to conduct a seemingly impartial evaluation of federal programs to determine whether they deserve continued funding and support. The budget request for USBR contains an explicit statement that, based on PART findings, water reuse is determined not to be part of the "core mission" of USBR. It further suggests that this is a program without controls or sound management. This evaluation could not be further from the truth. In fact, if one were to review the internal documents that served as the core research for PART, you would be astonished to learn that the analysis found the program to be effective in creating new water supplies to meet the purposes of Title XVI. Title XVI projects are professionally designed and engineered. Projects must have local cost-share and the Federal exposure is limited to providing the much needed assistance to leverage non-Federal resources to build these projects. These are projects that, I wish to emphasize, help to comply with Federal environmental mandates by providing protection to the environment and ensuring safe water supplies.

One does not need to delve into reams of paper to question the direction the Administration is heading, however. The Administration may believe that water reuse is not part of the Bureau's core mission, but the statutory obligations of Title XVI suggest otherwise. Congress explicitly authorized these projects. We request that you contact your colleagues on the Committee on Appropriations and urge them to reject the proposed budget level and policy direction of the budget by increasing Title XVI funding levels to at least $30 million and to include language that reinforces what is obvious, namely that water recycling and reuse is part of the core mission of USBR.

I also want to take a moment to express our concern about the USBR not providing to Congress to date the reports detailing the results of the Southern California Comprehensive Water Reclamation and Reuse Study (SCCWRRS) and the Bay Area Regional Water Recycling Project (BARWRP). For several years, the projects' co-sponsors have waited patiently for the final reports to be released. Each time an effort is made to secure the studies, we have been told that it is only a matter of weeks before it will be available. More than 70 communities have contributed to the funding of these studies. The time has long passed for patience. We urge the Subcommittee to direct the immediate release of these studies without further delay. Once the Subcommittee and the public has access to these studies, we can then proceed with the development of regional projects that will support compliance with the quantification settlement agreement (QSA), advance the knowledge of water reuse, and enhance economic productivity through increased yield based on reliable sources of water.

The projects specified in SCCWRRS present excellent opportunities for the Federal government to support the development of water projects that will benefit all Colorado River basin states and substantially leverage Federal resources that would be intested. Benefit-cost ratios in the draft report show that an investment of approximately $500 million in the 34 projects specified in the report would yield $2 billion in benefits.

In summary, we believe that Title XVI is part of the core mission for USBR and the way to bring about water reliability throughout the West is through a solid partnership between the Federal and local governments. With regard to the SCCWRRS and the BARWRP reports, we further believe that "a deal is a deal." When local communities contribute to Federal studies as partners, based on an understanding that reports would be developed and published, the act of preventing the publication of such studies must be dealt with in a clear and forceful manner.

Summary and Recommendations

In summary, we believe that increased beneficial water reuse will be a critical component of the nation's water supply in the 21st century. To ensure that this important resource is fully utilized and that appropriate actions are taken now in order to avoid a future water crisis, the Federal government needs to play a leadership role. Some of the specific actions that should be taken by the Subcommittee include the following:

- support the formation of a multi-agency taskforce in CEQ to inventory water reuse programs within the Federal establishment and identify opportunities for enhanced water reuse and water use efficiency;
- support additional research on water reuse that is essential to developing answers to questions on environmental pollutants of concerns and to gaining public acceptance;
- direct the U.S. Bureau of Reclamation to continue to include water reuse as part of its "core mission;" support increased funding for the Title XVI program;
- support the enactment of legislation that would put in place a comprehensive program to authorized much needed water reuse projects similar to the kind of commitment Congress has made to wastewater and drinking water treatment needs; and
- increase Federal "venture capital" targeted grants (e.g., Title XVI) to assist communities in developing innovative reuse projects.

Conclusion

Once again, the WateReuse Association wants to thank you, Mr. Chairman, for convening this hearing. We would be happy to work with you in addressing critical issues related to water reuse, water use efficiency, and salinity management. We are strongly supportive of your efforts to ensure adequate and safe supplies of water in the future for the western United States.

Appendix A

Examples of Successful Water Reuse Projects in the U.S.

"Water Factory 21" in Orange County (CA) — The Orange County Water District (OCWD) manages and protects the vast groundwater basin in northern and central Orange County, CA that supplies approximately 75 percent of the water used by over two million residents in the agency's service area. For four decades, the District has advocated treating and recycling municipal wastewater as a reliable supplemental water supply to make its service area as self-reliant as possible. OCWD's premier water recycling project is a groundwater recharge program that has been designed to prevent salt water from infiltrating and contaminating the groundwater basin. OCWD takes wastewater from the neighboring Orange County Sanitation District and processes it through an advanced treatment system that includes granular filtration, reverse osmosis and ultraviolet radiation disinfection. This is OCWD's "Water Factory 21," which is designed to reclaims over 15 mgd of recycled water. After treatment, the recyled water is blended with local well water and is injected into the groundwater basin through a series of 23 multi-point injection wells. The fresh water forms a "water mound," blocking further passage of seawater. The project has been operating since 1976.

City of Phoenix (AZ) - The City of Phoenix operates three water reclamation facilities. The largest facility operates in cooperation with four other municipalities that also own the plant. The reclaimed water produced by this plant is the sole source of water for cooling towers at the regional Palo Verde Nuclear Generating

Facility. Reclaimed water is also used for area farmlands and for restoration of wildlife habitat at the City's Tres Rios River Restoration Project. Tres Rios River is an example of how reclaimed water can by used to benefit the environment and enhancing quality of life.

County Sanitation Districts of Los Angeles County (CA) Reclaimed Water Projects - The Sanitation Districts of Los Angeles County (Districts) provide for the wastewater and solid waste management needs of over five million people in 78 cities and unincorporated areas of Los Angeles County, CA. The Districts operate 11 wastewater treatment facilities, 10 of which are involved in water reclamation. These 10 facilities produce 200 mgd of reclaimed water ranging in quality from undisinfected secondary effluent to filtered, disinfected tertiary effluents. The reclaimed water is reused for a variety of applications including landscape and agriculture irrigation, industrial process, recreational impoundments, wildlife habitat maintenance and ground water replenishment. There are over 450 water reuse projects serving 26 cities.

Pinellas County Utilities (FL) - Pinellas County Utilities provides drinking water, wastewater, reclaimed water, and solid waste serves to almost 1 million people in the Pinellas County which includes 24 municipalities. Pinellas County has a reclaimed water system that serves golf courses, residences, and commercial customers. The County is in the process of upgrading of two utilities treatment plants to expand capacity from about 13 mgd to 30 mgd and to upgrade the treatment process to an advanced wastewater treatment (AWT) process. These upgrades will allow the continued safe use of reclaimed water in the distribution system as well as allowing for discharges to surface waters during wet weather periods without adverse environmental impacts. The project will also provide for construction of major reclaimed water transmission mains. The use of reclaimed water helps to extend, conserve and protect valuable drinking water resources by off-setting demand.

Harlingen (TX) — Harlingen, Texas, a city of about 57,000, is an excellent example of a municipal and industrial partnership to reuse reclaimed water. Harlingen provides 65 to 70 million gallons per month of reclaimed municipal wastewater to a hosiery manufacturer for manufacturing, and there is a demand for increased supplies in the future.

West Basin Water Recycling Project (CA) -- West Basin Municipal Water District is a public agency that provides imported Colorado River Water and State Project Water to residential customers and water companies in southwest Los Angeles County, CA. In addition, the District provides its customers with recycled water that is used for municipal, commercial and industrial applications. The West Basin Water Recycling Project provides almost 22,000 acre-feet of recycled water annually, distributed to more than 150 sites. These sites use recycled water for a wide range of applications. Based in El Segundo, California, the state-of-the-art Water Recycling Facility is among the largest projects of its kind in the nation, with the ultimate capacity to recycle 100,000 acre-feet per year of wastewater. The150 plus sites use 7.1 billion gallons of West Basin's recycled water for non-drinking applications including irrigation, barrier water and industrial processes. West Basin has been successful in changing the perception of recycled water from merely a conservation tool with minimal applications to a cost-effective business tool that can reduce production costs, water filtration costs, and limit the need for expensive chemicals and dyes. Local oil refineries are major customers for West Basin's recycled water. The Chevron Refinery in El Segundo and the ARCO Refinery in Carson use recycled water for their cooling towers. The Mobil Torrance Refinery uses the water not only in its cooling towers but also in its boiler feed system.

San Antonio's Water Recycling Centers - San Antonio Water System (SAWS) provides drinking water, wastewater, and water reclamation services to over 1 million people in San Antonio, the seventh largest city in the U.S., and the surrounding area.

SAWS has one of the largest water recycling systems under development in the U.S. SAWS, which calls its four award-winning wastewater treatment plants "Water Recycling Centers", produce 120 mgd of tertiary treated recycled water (sand filtration followed by chlorination and then dechlorination). By recycling its wastewater, SAWS is improving and protecting receiving stream quality and increasing water supply reliability and redundancy. Making greater use of recycled water will be one of the keys to making more water available for economic growth and development in San Antonio. Recycled water use is growing in San Antonio and includes agricultural irrigation, irrigation of public parks, and improving water quality in the Medina and San Antonio Rivers.

Water Conserv II (FL) -- Water Conserv II, one of the largest water reuse project of its kind in the world, is the first water reuse project in Florida to irrigate crops produced for human consumption with reclaimed water. Jointly owned by the City of Orlando and Orange County, it has taken a wastewater effluent

previously discharged to surface water bodies and turned it into reclaimed water, as asset that benefits the City, the County, and the agricultural community. The system encompasses two water reclamation facilities connected by transmission pipeline to a distribution center. From the distribution center, reclaimed water is distributed to 76 agricultural and commercial customers. The reclaimed water that is not used for irrigation is distributed to Rapid Infiltration Basins for ground water replenishment. The reclaimed water is monitored and controlled from a central computerized control system.

Monterey County Water Recycling Projects - Monterey Regional Water Pollution Control Agency (MRWPCA) and the Monterey County Water Resources Agency operate a regional water recycling project for agriculture. Nearly 20,000 acre-feet per year of water is used to irrigate over 12,000 acres of food crops. The recycled water reduces coastal seawater intrusion, as well as replaces groundwater that is often too salty for long-term irrigation. Implementation of the project was made possible by an 11-year study that verified the safety of food crop irrigation. An extensive public outreach program was developed to address the needs and concerns of local growers. MRWPCA and the Marina Coast Water District want to further expand water reuse to urban uses including landscape irrigation and possible industrial applications. This project would involve ground water storage during the winter which has the additional benefit of slowing salt water intrusion.

####