Statement of
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Director of Utilities
City of Aurora, Colorado

Testimony
Before the
U.S. House of Representatives
House Resources Committee
Subcommittee on Water and Power
December 12, 2003

Concerning –
" Colorado: Options to Increase Water Supply and Improve Efficiencies"

INTRODUCTION

My name is Peter D. Binney. I am the Director of Utilities for the City of Aurora, Colorado. Aurora is a growing municipality of nearly 300,000 people in the eastern Denver metropolitan area and operates the third largest municipal water system in the State. Aurora is strategically located to be home to more than 500,000 people in the next 25 years and to contribute significantly to the vitality and economic well being of the State of Colorado.

Aurora represents an important case study in how the State of Colorado could potentially respond to the forecasted growth of the Front Range population by 3,500,000 people in the next 60 years. The recently completed Colorado River Return Reconnaissance Study, 2003 has projected that the Front Range Corridor between Pueblo and Fort Collins, including the Aurora, Denver and Colorado Springs metropolitan areas, must develop an additional 784,000 acre-feet of water in the next six decades. Aurora is an important subset of those demands and will develop new sources of water totaling approximately 85,000 acre-feet by the year 2060. Many of these projects must be completed in the next 10 – 25 years to provide an adequate, safe and reliable water supply to these growing communities. These new water sources must be developed in a cooperative, timely and systematic manner while respecting the social, environmental and institutional values that are embraced by all the citizens of Colorado.

The conundrum the State of Colorado is facing lies in this forecasted growth in population and resulting water demands along the Front Range. Our existing infrastructure of reservoirs, pipes, pumps and treatment plants are capable of meeting our current or near-term needs for water. They are not, however, adequate for meeting these forecasted needs and must be expanded significantly.

The State of Colorado does not have a "Panacea Project" that can miraculously be turned on to meet the needs we expect to have in the Year 2060, let alone in the Year 2010. We do not have untapped pots of water that provide an effective or easy solution to our forecasted demands. We must therefore make the hard decisions of changing the way we use water in the state and recognize we have moved beyond the "Man over Nature" phase of the early 20th century and we are now in a phase of reallocating or trading off the finite bucket of water we can use to meet the State's water needs. We must bring water from remote geographic areas or we must trade some of our established and appropriated uses of water for those that will meet our needs in the future. These needs are not only municipal water uses across the State from Beulah to Julesburg to Aurora. They also include needs for environmental and ecosystem protection, recreational, agricultural and other non-consumptive uses that our citizens may embrace.

The State of Colorado must accept that new water supplies will move from the West Slope across the Continental Divide as well as other river basins and either permanently, or an interruptible basis, from agricultural uses. The cities must accept that these projects will be built in a cooperative and participative

way and that multiple benefits including mitigation and enhancement projects will be included. These are expected to significantly increase the costs to urban water users. The economic vitality of the Front Range communities should be seen not as a threat to other parts of the State or to traditional water users but rather as the opportunity to effectively guide the State's decisions on water management and policy.

The recent defeat of Referendum A illustrated the concern that Coloradoans have over the methods used by water providers and private interests, as well as state and federal agencies, in meeting the changing needs for water across the State. The Referendum A debate again polarized opinions and positions reminiscent of past water wars. I believe what did emerge though, was a better understanding that pragmatic and effective solutions need to be identified. No "blank checks" will be written. Only then can the public appreciate and make informed decisions on what the future plumbing system will look like, how it can be enlarged and how it can be operated to benefit other communities while also protecting our environment. And all of this has to happen in an economic and timely manner.

I would suggest to you that the engineers, hydrologists and managers of the water systems across the State have a sound appreciation of the range of technical solutions that could be implemented. In my written testimony, I have identified many of the strategies that will be employed by the City of Aurora to meet its identified needs. I would also suggest to you that systems like Aurora's are capable of financing the more than one billion dollars in capital improvements we have identified that need to be built in the next 10 – 12 years. What exacerbates the implementation of this program are governance, political, regulatory and institutional issues and the de facto conflict resolution process that local water agencies must navigate to make something happen.

While the cities and urban water needs cannot be satisfied by riding roughshod over the needs of others, we collectively do not benefit from guerilla warfare tactics, obstructionism and an inability to make commitments to meet our future needs.

Our long-term solutions are in storing water in enlarged and new reservoirs, in pumping water from geographically remote areas or in changing the ways we use water currently in the Arkansas and South Platte River basins. Those changes in ways we use water could come from transfers or leases of agricultural water, reclamation of potable water from treated effluent, conservation and demand management, conjunctive uses of surface and ground waters or water system integration.

We, as a State, cannot accept the "Do Nothing" alternative and must successfully enlarge the water supply infrastructure needed for the future and do that in a manner that is respectful of the needs of all responsible stakeholders. To do otherwise is disingenuous, it wastes time in chasing "paper water" or illusory solutions and sets the State towards a position where it will deal with this need in a time of crisis rather than solving it in a programmatic and participative approach that can benefit the State as a whole.

CURRENTLY AVAILABLE WATER SUPPLIES

As with many of the growing cities in the West, Aurora has been developing its water supply systems since the early 1950's and must develop its water supplies from the relatively junior water rights and sources left after more than 100 years of water development by agriculture and the older cities and industries. These available water sources are typically less reliable during dry years (and therefore require proportionately larger reservoirs to provide reliable sources of water), are geographically remote from the cities and require major investments to develop. In fact, water rights in the South Platte River basin with priority dates of later than 1876 are typically considered unreliable for meeting municipal water demands without major reservoirs being available to buffer hydrologic uncertainty.

In developing its water rights portfolio, the City of Aurora has used many of the practices that will be representative of future water programs. Key components of the City's Water System include:

• 75% of the City's water has been developed by transferring senior agricultural water rights for municipal use;
• approximately 50% of the City's water has been developed by transferring water from the Arkansas and Colorado River basins into the South Platte River basin;
• approximately 80% of the City's water supplies result from snowmelt between May 1 and July 31 and must be stored in reservoirs for delivery to the City in other months or for carryover to drier years;
• the City currently uses close to 80% of its reusable return flows through water trades, augmentation, irrigation of parks and open spaces, exchanges and leases;

• Aurora has developed and implemented an industry-leading Water Conservation Program that has reduced municipal water demands by more than 30% from Year 2000 levels but that has come at a cost of higher water rates and impacts on the environment in the City;
• Aurora has entered into numerous Intergovernmental Agreements or contracts with the federal government, counties, water providers and water conservation districts to develop water by efficiently using existing infrastructure and to mitigate the impacts of Aurora's water developments;
• Aurora has signed agreements with Arkansas Valley interests that preclude future permanent transfers of agricultural water for a 40 year period, significantly subsidize the cost to local water users for reimbursement to the federal government for Fryingpan-Arkansas Project, provide a reliable mechanism for dry-year leasing of agricultural water without disrupting the agricultural economy and makes substantial payments to the local water district to address in-basin water needs;
• Aurora is developing an Integrated Resource Plan for the development of an additional 85,000 acre-feet per year of water. This Plan to double the size of the Water System will emphasize the development of water sources through cooperative programs with farms and other parts of the State and will incrementally add onto the core physical infrastructure built over the last 50 years.
• Aurora has identified close to one billion dollars in infrastructure and water supply development needs in the next decade and has instituted rate and tap fee increases to generate the necessary funds from its current and future customers. New customers on the Aurora Water System now pay 56% more for a tap than they did two years ago and water rates have increased at 15% per year. These increases do not include additional drought surcharges or burdensome tiered pricing structures of nearly 400% for higher water users. No subsidies are requested from the state or federal government and Aurora is prepared to pays for its own programs, if needed.

Aurora is now planning the next phases of it's long-term water acquisition program.

IMPACTS OF ONGOING DROUGHT

The effects of the ongoing drought are still pronounced and continue its adverse effects on cities, farmers and the environment. Regional drought conditions are not ameliorating across the Western United States and unless there is a substantial change in forecasted weather patterns, the city will face its third year of highly restrictive water uses in 2004. The City of Aurora's storage levels in its reservoirs was reduced to 26% of capacity in the spring of 2003 but will have recovered to 40% of capacity in the spring of 2004. A seasonal minimum reservoir capacity of 60% is considered acceptable for Aurora's municipal water system. This recovery in reservoir levels was not a result of higher water flows in the streams but the product of exceedingly high levels of water conservation, the purchase of water rights and very successful development of interruptible supplies through short-term leases of agricultural and industrial water.

In 2003, Aurorans conserved aggressively and used 30% less water than they did in Year 2000. A comprehensive Water Conservation and Water Management Plan has guided our customers in all aspects of their water use from toilet flushing practices to water glasses in restaurants to limiting the sizes of lawns. Aurora's water customers did also pay a marginal rate of $2885 per acre-foot per year for watering larger lawns in the City. This economic disparity between water used for some agricultural uses at a rate of less than $100 per acre-foot per year is one of the major paradoxes that Colorado's water managers and policy makers will have to address.

Aurora also developed other water sources to increase the robustness of its current water supply system and to aid in drought recovery. The Cities of Thornton and Aurora negotiated the sale of Thornton's Upper South Platte water rights to Aurora. This yields 7,146 acre-feet per year to Aurora while return flow obligations from Aurora replace that water for Thornton's needs. Aurora paid more than $51,000,000 through the sale of revenue bonds issued through the City's Water Enterprise Fund. Additionally, Aurora, the Southeast Colorado Water Conservancy District and Upper Arkansas Water Conservancy District entered into long-term Intergovernmental Agreements that should settle twenty years of often acrimonious and unproductive dispute. Details of these agreements are described later but of significance include the potential for periodic dry year leasing of agricultural water rights that assist in drought recovery but do not require permanent transfers from agricultural water uses.

This ongoing drought has rudely reminded all water users (including recreationists and environmentalists) that we live in a semi-arid climate and in a region that is periodically exposed to severe and sustained drought conditions. The last century was one of the most benign climatic periods we have seen in the last 2000 years so many of our policies and presumptions about water and its reliability have been formed in a

time of surplus. It is not prudent, nor is it responsible, to only construct new projects or adapt our emerging water policies every few decades, as we have been prone to do. Inevitably, our needs change or available capacity in existing infrastructure is absorbed and we place ourselves behind the proverbial “eight ball”. The game of billiards is not often won if we have to rely on trick shots too often.

WATER SUPPLY DEVELOPMENT STRATEGIES

The State has seen numerous proposals in recent decades to structurally develop major new water projects. It has been estimated that more than $100 million in engineering and legal fees has been spent in the last decade alone on various proposals but not one gallon of water has been developed from most these efforts. Something critical has been missing from this approach to water supply planning. The packaging or public/ institutional acceptability of the proposals has been flawed in some fatal way.

The challenge as we reformat our approach for the future is to find the balance between past and future water uses and different geographic areas of the state that are either supply-rich or demand-rich. Unfortunately, these attributes are often mutually exclusive and so tradeoffs of current uses or physical delivery of new water supplies to those areas with additional water needs will have to occur. Or, we will have to implement elegant cooperative programs whether the farms, cities and environment to establish a new, balanced and sustainable equilibrium.

The bottom line for water managers and policy makers is that no one strategy is likely to meet their future water needs so an integrated approach that embraces demand management, new source development and basin of origin mitigation and environmental protection will be required. We do not believe these requirements should be codified but rather result from negotiation between the parties with State Government providing an arbitration (through Water Courts and otherwise) or facilitation role. If those negotiations are unsuccessful, no water project will proceed.

A component of future water sources will be met through more efficient use of existing water rights or infrastructure as described in the following section. Those efficiency strategies will be supplemented by new source strategies that could include the following approaches.

Unappropriated and Developable Junior Surface Water Rights

Hydrologists recognize that some water is available for development at or near the points where our major rivers leave the State. It was this recognition that led to the recently completed studies of the Big Straw concept. Certainly, a technologist can plan massive pump back systems from the Colorado River at the Utah State line, from the lower Arkansas River downstream from La Junta and from the lower South Platte River downstream from Julesburg. But the Big Straw report did start quantifying the multi-billion dollar costs and major environmental hurdles that are associated with these projects. The report does, however, stimulate us to consider other more reasonable alternatives including mid-basin reservoirs and re-operation or reallocation of water supplies that are currently bypassing the emerging demand centers on their way to downstream decreed water users. Rather than the heroic home run hits of Stateline pump back systems it is certainly reasonable to incorporate more modest proposals such as Aurora’s Camp Hale pump back project or Colorado Springs’ Southern Delivery System. It is also reasonable to further evaluate the Green Mountain Pump back, Blue Mesa Pump back and Reudi Pump back alternatives in long range planning.

New Reservoir Storage

A fundamental component of all future water supply programs will be the addition of new reservoir storage. The strategic location of new reservoirs and operational interconnection with existing delivery systems can capture wet year or high spring runoff flows, be used to substitute water releases from existing reservoirs for downstream water needs while allow higher utility of those upper basin reservoirs for future uses, enhance return flows for Interstate Compact and environmental uses, and stage water deliveries so current delivery systems can be used more efficiently.

Agricultural Water Rights

Aurora is currently participating in, and has plans to expand, cooperative farm-city programs with willing agricultural water users as a part of its long-term water management programs. When a willing buyer-seller or lessor-leasee partnership can be developed, Aurora invites discussion on identifying whether it is feasible to enter into a relationship that would benefit both parties. We are willing to discuss opportunities with the

Colorado Farm Bureau as well as ditch companies or senior water rights holders and to identify appropriate terms of mitigation projects that would allow a water project to proceed.

Agricultural water uses represent the largest consumer of water in the State with over 14 million acre-feet of irrigation annually. Of the State's overall water uses, 5.5 million acre-feet or 93% of the State's total water consumption is used by agriculture. Under the hypothetical assumption that all the Front Range's future consumptive water needs (55% of 784,000 acre-feet or 430,000 acre-feet) were to be met by transfers from agriculture, then the State would still have 5.1 million acre-feet or 86% of the States' water available for irrigation. Colorado will still predominantly be an agricultural water using state. It is possible that the effects of agricultural transfers will be concentrated closer to the emerging demand centers so localized effects of transfers will have to be carefully evaluated. It is unlikely that the southwestern or northwestern areas of the State will be involved in any future programs to meet the emerging water needs of the Front Range.

Denver Basin Aquifers

These large nontributary and non-renewable aquifers underlying much of the Front Range are an important water resource that must be managed and developed in an integrated and sustainable manner. Prior over-estimates of the aquifers' capacity have resulted in over pumping and declines of water tables exceeding thirty feet per year. While more than 99% of the theoretically recoverable water is still in the aquifers, the cost of extracting that non-renewable resource is escalating and will require groundwater dependent users to develop alternative sources or conjunctive use water systems. The costs of this infrastructure will exceed one billion dollars and a reliable and sustainable surface water source must still be identified and secured.

PROMOTING MORE EFFICIENT USE OF EXISTING INFRASTRUCTURE AND WATER RIGHTS

Past water development projects have essentially used all the reliable yields in streams that flow to the Front Range. Any new water development programs bringing water from other river basins will likely have to be integrated into the infrastructure and operations of current users including the Colorado Big Thompson Project, Denver Water, Aurora, Colorado Springs and the Fryingpan-Arkansas Project. New water projects could most likely deliver new water for interconnection to these existing systems and then redistribute water along the Front Range to individual customers. The physical reality of the State's topography and past water development practices along the Continental Divide must be considered by those who are responsible for planning and implementing future solutions.

It is envisaged that an integrated water management plan meeting the needs of the growing cities will include at least the following.

Water Conservation

A benefit of the ongoing severe drought conditions is the development and broad implementation of highly restrictive water use programs not seen in the Front Range since the 1950's drought. This reminder that we live in a semi-arid climate has reinforced an ethic of responsible water stewardship in Front Range cities that while widely practiced in the past, had not been codified to the extent now in practice. It is expected that these benchmarks of water use will be a part of water utility operations in the future. Certainly the literature describing effective water conservation programs will be updated to reflect the beneficial performance of these programs in arid climate areas.

This ethic of wise water stewardship in the cities results in higher utility of the existing investments in water development and also reduces the rate of increase in which new water supplies must be developed.

Water Reclamation

The treatment of municipal sewage so it can be used for outdoor irrigation or, with enhanced tertiary treatment, for indirect potable use are expected to be important components for future water supply plans for Front Range communities. There are many examples where non-potable reclamation is occurring in Colorado Springs, Aurora, Denver and the South Metro area. While the development of these programs are an advantage to a particular community, they do reduce the return flows to streams and so the environmental impacts and effects on downstream water users who have relied on these discharges must be assessed against the impacts on new source water development.

More Effective Use of Federal Projects

The City of Aurora has developed its water rights in the Arkansas River basin in part through creative and beneficial operating strategies that use the federal Fryingpan-Arkansas Project. While Aurora is not a Project Participant and is not represented on the governing body of that Project, annual payments made to the US Bureau of Reclamation and to local agencies will represent nearly 50% of the local cost reimbursement share when the federal debt is repaid. Aurora's participation effectively halves the cost of local farmers, the City of Colorado Springs and Pueblo and others for the benefits of using this federal project.

Transferred agricultural water rights are exchanged upstream to an existing point of diversion on the Arkansas River to the South Platte River basin for delivery to the City. These exchanges are made only when there is no adverse impact to Project participants and indeed a 10% premium in delivered water is made to other in-basin users for every acre-foot of water delivered to Aurora. Additionally, Aurora will pay $21 million to the local water district to allow local solutions to local water problems.

Conjunctive Use and Groundwater Development

Many newer water utilities and districts have relied on the groundwater resources underlying much of the Front Range in the Denver Basin aquifers. The recently completed South Metro investigations have identified the finite nature of those aquifers and estimated the cost of developing sustainable water sources to supplement the use of groundwater in a conjunctive use approach. The combination of surface water and groundwater resources in a conjunctive use program will allow efficient use of available local water supplies although one resource will not be effective without the other.

Rehabilitated Storage Reservoirs

The State of Colorado has cataloged those reservoirs where storage capacity is limited because of dam safety issues. Selective repairs to these dams can be an important water supply component with typically limited environmental impacts.

Water System Integration and Consolidation of Water Development
An economy-of-scale must be achieved before a significant water development project becomes feasible. Many of Colorado's current water systems are tied to local jurisdictions and individual cities or districts still fiercely voice their independence and need for autonomous control of their water systems. There will be little progress made in solving the major water needs of these growing cities until a new regional governance model is initiated. Denver Water followed this model when they became the contract provider of water for more than 50 suburban contracts. It was also the realization of this factor that allowed other metropolitan areas such as Tampa and Las Vegas to move beyond their previously balkanized, divisive and ineffectual approaches to meeting growing urban water needs. It has been proposed as a solution for the needs of the South Metro Denver area as they respond to the major capital requirements of developing a reliable and renewable water supply system to supplement their use of diminishing groundwater supplies. It is also seen as a possible role for Aurora as they develop their future water sources.

Appropriation Doctrine Identifies Standards of Developing New Water Sources
The State of Colorado's Appropriation Doctrine codifies and protects the property right nature of a water right and allows for the transfer of existing water uses to the extent that no other senior water rights holders are injured by that action. The State's Water Courts and legal system are diligent in assuring that the redistribution of water through this process does not cause injury and protects other values including in-stream flows. Additional tests applied by the Water Courts include the required demonstration that a water right can and will be developed – this requires that the applicant can secure all local, state and federal permits.

The numerous overlapping regulatory checks and balances as well as the rigor of the financial markets minimizes, if not prevents, the speculative or damaging impacts of future water projects. Indeed, there are many who would suggest that this multi-layered oversight has crippled the ability of sound and needed projects from proceeding and not just preventing the infeasible or poorly considered projects from happening.

CONCLUSIONS

The State of Colorado is forecasting a doubling of its population in the next fifty years with much of that

growth occurring in Front Range cities between Pueblo and Fort Collins and not just the Aurora – Denver metropolitan area. This population growth will require the development of major new water infrastructure and require very effective uses of water in the cities as water is delivered from other river basins or transferred, temporarily or permanently, from current water uses. This development and reallocation of the State's water must occur in a respectful and collaborative manner that recognizes the needs of all responsible stakeholders. But the result of this process should be the structured and systematic development of the infrastructure that will deliver water to the cities while ensuring adequate water for other users across the state and for ecosystems and the environment.

An integrated program should come from local water agencies as they identify the infrastructure and operational needs of their water systems. State and federal governments should work cooperatively with the water agencies to facilitate the decision making process and represent the interests of all responsible stakeholders who may also have an interest or concern about proposed projects.
EXHIBIT A

DISCLOSURE REQUIREMENTS
FOR
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TRAINING AND EDUCATION:

University of Canterbury – Christchurch, New Zealand
Bachelor of Engineering (honors), 1974

University of Canterbury – Christchurch, New Zealand
Master of Engineering, 1975

University of Colorado – Boulder, Colorado
Master of Science, 1977

Professional Engineer – Colorado #16167

Member – American Water Works Association, American Society of Civil Engineers, Society of American Military Engineers, Colorado Water Congress (Board member)

EXPERIENCE

City of Aurora
Director of Utilities, 2002 to present

MWH
Principal Engineer, 2000 – 2001

CH2M HILL
Vice President, 1980 – 2000

WRIGHT WATER ENGINEERS
Water Resources Engineer, 1977 – 1979

Beca, Carter Hollings and Ferner

Engineer, 1974 – 1975

SECTION B INFORMATION:

Not required – Aurora Utilities Department is an Enterprise of the City of Aurora, a home rule municipality duly organized and existing pursuant to Article XX of the Constitution of the State of Colorado.