Appendix B
American Assembly I Statement

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AMERICAN ASSEMBLY I STATEMENT

Regarding Water Reuse Goals, Objectives, Options and Criteria

City of San Diego
Water Reuse Study 2005

American Assembly Workshop I
October 6, 7 and 29, 2004

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October 6, 7 and 29, 2004

San Diego, California

I. Introduction

The City of San Diego has been tasked through City Council Resolution R-298781 to conduct an impartial, balanced, comprehensive and science-based study of all recycled water opportunities so the City of San Diego can meet current and future water needs.

Recycled water is municipal wastewater that has been treated to a high level so that it can be reused for a variety of beneficial purposes.

The mission of the study is stated below:

To pursue opportunities to increase San Diego's water supply reliability and optimize local water assets, through an open and comprehensive study of recycled water with the involvement of the community.

The five primary goals of the study are:

1. To identify and develop opportunities for uses of recycled water that protect public health and safety.
2. To identify and develop opportunities for recycled water that are cost-effective, environmentally sustainable and reflect public values through a fair and unbiased evaluation.
3. To partner with residents, media, businesses, industries, organizations, schools and government to assist public policy makers in making informed, value-based decisions on how to best use recycled water.

4. To educate the public to expand the public's awareness, knowledge and involvement, and present information in a way that is understandable and accessible to all San Diegans.
5. To provide sound technical, environmental, and economic evaluations of the opportunities, with plans, to submit to the City Council for consideration.

Reuse opportunities will be examined through public involvement sessions and an Independent Advisory Panel of experts will review, critique and provide recommendations on study efforts.

A group of community leaders and stakeholders participated in an American Assembly in San Diego, California in October 2004 to debate and validate the goals, objectives and evaluation criteria (values) for study consideration and, ultimately, any City Council policy decision. The intent of this first American Assembly workshop was to discuss and document community viewpoints and issues related to recycled water use and ensure that the study examines those issues.

The assembled group addressed six questions:

1. Have the appropriate goals and objectives been identified?
2. Are there other goals and objectives that should be considered?
3. What water reuse opportunities should be considered?
4. What are the key considerations associated with these reuse opportunities?
5. What should the study team investigate?
6. Are the values presented appropriate for comparing the reuse opportunities?

The delegates to the American Assembly debated and recorded their perspectives on recycled water use alternatives. This American Assembly Statement reflects a

spectrum of consensus views of the assembled delegates and was affirmed in plenary session. Significant minority viewpoints are included.

II. Summary Statement

The Assembly strongly believes that recycled water can and must play a significantly greater role in the City of San Diego providing added water reliability and environmental benefits. As such, the Assembly is unanimous in its support for the expansion of recycled water for non-potable uses.

The majority of the Assembly supports the aggressive and visionary expansion of recycled water for potable and non-potable uses where the opportunities exist. There are critical conditions that must be met for any alternative that will expand this supply. First and foremost, it must be safe and protect public health. While the Assembly offered strong support for indirect potable reuse, there are clearly members of the Assembly and the community who are concerned about the public health effects of indirect potable reuse. This issue will need to be thoroughly explored and the state of knowledge regarding treatment processes, reliability and risk assessed. A clear presentation of the technical information in a readily understandable manner is vital to ensure any public policy decision is well informed. The Independent Advisory Panel will be especially helpful in this regard.

Of nearly equal importance is the cost-effectiveness of the water supply, imported and recycled. Both direct and avoided costs must be compared on a common basis. The study must be sensitive to those in the community for which water costs represent a substantial economic burden. In this respect, grants, incentives and other external funding must be pursued.

It is critically important to the success of any proposal that the Water Department aggressively pursue community outreach and public education activities to foster understanding of the alternatives and issues. A well-informed public will help ensure

that any public policy decision of the City Council is sound. Lastly, the Assembly believes strong community and political leadership is necessary to advance the goals and objectives of the study.

III. Evaluation Criteria (Values)

In the view of the Assembly, the evaluation criteria listed in the white paper are reasonable. The Assembly believes there are certain refinements that would improve the quality of the assessment. In particular, there is a primary concept of "sustainability" that should guide the assessment of the alternatives. Sustainability considerations include public acceptance, protection of public health, cost-effectiveness, protecting and restoring the environment, greater regional water reliability, and diversification of supply. In assessing reuse opportunities and alternatives, the Reuse Study must describe and communicate the consequences of not maximizing the use of this water. These consequences include the need to obtain other water supplies, or barring this to incur supply shortages.

Specific evaluation criteria are listed in the table below.

Table 3-1

Evaluation Criteria for Assessment of Reuse Options

Criteria	Objective	Performance Measure
Health and Safety	To protect human health and safety with regard to recycled water use	Meets or exceeds federal, state and local regulatory criteria for recycled water uses
Social Value	To maximize beneficial use of recycled water with regard to quality of life and equal service to all socioeconomic groups	Comparison of beneficial uses and their effect on human needs and aesthetics, as well as public perception.
Environmental Value	To enhance, create or improve local habitat or ecosystems and avoid or minimize negative environmental impacts	Comparison of environmental impacts and/or enhancements, environmental impacts avoided, and permits required.
Local Water Reliability	To substantially increase the percentage of water supply that comes from water reuse, thereby offsetting the need for imported water	Increases percent of water recycling and improves local reliability.
Water Quality	Meets or exceeds level of quality required for the intended use and customer needs	To meet all customer quality requirements.
Operational Reliability	To maximize ability of facilities to perform under a range of future conditions	Level of demand met and opportunities for system interconnections and operational flexibility are addressed.
Cost	To minimize total cost to the community	Comparison of estimated capital improvement costs, operational costs, and revenues for each reuse opportunity, as well as comparison of estimated avoided costs such as future regional water and wastewater infrastructure costs and costs to develop alternative water supplies (e.g. desalination).
Ability to Implement	To evaluate viability or fatal flaws and assess political and public acceptability	Level of difficulty in physical, social or regulatory implementation.

Health and Safety

The safety of recycled water, whether for potable or non-potable uses, is the paramount issue. The primary objective of all projects considered under the Reuse Study is to protect human health. It is essential that recycled water meets or exceeds applicable federal, state, regional, and local regulations. The use of recycled water as a source of supply must incorporate stringent monitoring requirements to ensure that health standards are met and public health is protected. Treatment goals may be established that are more stringent than regulatory limits as safety factors to make certain that the regulatory limits are never violated. Assembly delegates offered strong support for indirect potable reuse, however, there are members of the Assembly and the community that will require convincing evidence of the safety of indirect potable reuse to garner their support.

Social Value

Recycled water has the potential to enhance the quality of life in San Diego by providing a firm source of supply even in drought conditions. Recycled water must be made available at equal levels of service to all socioeconomic groups within the region so that these benefits can accrue to all. A carefully conducted reuse planning effort that includes thorough public outreach and community participation can also increase public trust in the region's water supply.

Environmental Value

Reuse alternatives must seek to sustain, enhance, or create local ecosystems, and to avoid or minimize adverse environmental effects with a goal of a net environmental benefit. The study must summarize key anticipated environmental effects for consideration by policy makers and stakeholders. The study must also identify the environmental documentation and permitting issues associated with each reuse alternative.

Local Water Reliability

The City should seek to substantially increase the percentage of its water supply derived from recycled water, thereby offsetting the need for imported water and enhancing the reliability of the City's supply. The Study shall address reuse goals that go beyond the goal established in its current Long-Range Water Resources Plan. Reuse opportunities that offset the need for imported water would be valued higher than opportunities that do not offset imported water supplies.

Water Quality

Certain users of recycled water have specific water quality needs. For example, salt tolerance of plants is an important criterion for irrigation uses. Certain industrial uses of recycled water are extremely sensitive to the amount of total dissolved solids. Further treatment of recycled water at the point of use may be required to provide finished water quality that is compatible with the intended use.

Operational Reliability

The Assembly delegates were generally comfortable with the Operational Reliability evaluation criteria. Timing of projects was identified as an important consideration.

Cost

While cost is an important issue for the Assembly delegates, it should not necessarily be the determining factor. The cost analysis must be comprehensive and allow comparison among opportunities identified and other water supply options (such as desalination, conservation, etc.). Initial costs, such as capital/ construction, design and environmental permitting are important components of overall project feasibility. Avoided costs (predominantly related to the water and wastewater systems) and costs

of inaction must be considered. Ongoing costs, such as operation, maintenance and public outreach must also be considered. Costs must be put in terms that consumers understand.

The delegates felt grant and other funding must be pursued. One viewpoint on grant funding noted that grant money is still taxpayer money and it may not be a complete offset. Costs shall also address incentives (e.g. revolving loan funds) and customer cost considerations (e.g. meters and dual piping). Cost incentives to customers, as well as an opposing viewpoint of whether low cost water devalues recycled water, should be pursued. Costs must also consider rates and revenue and the impacts and benefits to non-users of recycled water.

Ability to Implement

The study must evaluate the viability of the various alternatives including the determination of potential fatal flaws. The political and public acceptability of each alternative must be assessed.

IV. Reuse Options

The Assembly believes that the reuse options discussed in the white paper are appropriate for assessment but must be expanded to consider additional opportunities. Recycled water comprises approximately 6 MGD of the City's water supply and is anticipated to reach 12 MGD by 2010, based on current planning. The Assembly believes that this number should be expanded. The study must assess the ability of the city to use the full 45 MGD of existing recycled water capacity. The study must also assess the viability of expanding the system to maximize the feasible reuse of wastewater and minimize ocean discharge. The list of options for assessment shall include:

Non-Potable Reuse Options

Non-potable reuse encompasses all recycled water applications that do not involve blending with the public water supply. Examples of non-potable reuse are irrigation of golf courses and parks; most agricultural irrigation; industrial use for cooling towers and boilers; car washes and commercial laundries; and flushing of toilets and urinals. It can also include enhancement opportunities through environmentally beneficial live stream discharge or creation of wetlands.

Distribution System Expansion Opportunities. Opportunities to further expand recycled water service within the City, as well as to interconnect with adjacent municipal or agency operated recycled water systems, must be developed as part of the Reuse Study.

Maximizing use of recycled water from existing treatment plants is very important. Distribution system expansion could result in substantial savings in the cost of and need for imported water. Opportunities to further expand recycled water services within the City and interconnect with adjacent municipal or agency operated recycled water systems must be developed as part of the Reuse Study.

The Assembly delegates generally agreed with the opportunities associated with expanding the North City and South Bay distribution systems. The type of use, proximity to existing infrastructure, quantity used, water quality and system costs necessary for construction of separate piping systems needs are important considerations. Customer costs are equally important considerations in distribution system alternatives.

Delegates also suggested additional distribution opportunities including residential irrigation, increased usage for fire fighting, street/storm-drain cleaning application, and construction site dust suppression. Public/private partnerships with key stakeholders/customers should be considered to increase the distribution of recycled

water. Use of recycled water at regional (e.g. Balboa and Mission Bay Parks) and City neighborhood parks, as well as at other City properties, can serve as important examples to other potential users of recycled water. Distribution system expansion to local military bases could increase the potential for year-round use of recycled water. Interagency, regional and/or international opportunities that do not limit recycled water use to within City borders also should be assessed.

Seasonal Storage Opportunities. By providing seasonal storage the City could produce a constant flow of recycled water year round and store the off-season flows to meet peak irrigation demands during the summer months. Opportunities for seasonal storage include groundwater recharge and recovery, pumped storage/energy recovery and a dedicated recycled water reservoir. The Assembly encouraged the Study Team to investigate and evaluate possible reservoir and aquifer locations where seasonal storage could be located.

Wetlands Creation and Live Stream Discharge Opportunities. The Water Reuse Study must investigate using recycled water for discharge to existing streams (live stream discharge) as well as the creation or enhancement of wetlands. Seasonal discharge to replicate historic stream flows, and offstream wetlands creation opportunities in the vicinity of sources of recycled water supply, must be considered. Assembly delegates expressed concerns that wetlands development needs to consider historic environmental conditions and maintenance requirements. Most Assembly delegates recognized the benefit of creating areas where the public could observe wildlife and take advantage of recreational opportunities.

Water transfer of recycled water. The Reuse Study must identify opportunities and constraints of conveying recycled water outside of the San Diego region to the Salton Sea or to other areas. The transfer of recycled water could be in exchange for other water that would be conveyed to San Diego in the existing conveyance system or the recycled water could be sold and the funds used to purchase additional imported water (if available) or to develop other sources of local water such as desalination.

Satellite reclamation water plants. The Reuse Study must identify opportunities and constraints of constructing small recycled water plants adjacent to current and future locations that have potential recycled water demand, yet may be too far from the recycled water distribution system to receive recycled water in the future. Technology such as Membrane Bio-Reactors (MBR's) may be appropriate technology for satellite recycled water plants and can produce recycled water on demand.

Gray Water Opportunities. The Reuse Study shall investigate legal and physical opportunities and constraints of gray water use, with emphasis on ways and means that individual residential and commercial users may be able to utilize gray water on their property. This may require revising existing laws or ordinances.

Potable Reuse Options

Indirect Potable Reuse

Indirect potable reuse is the practice of taking recycled water that meets all regulatory requirements for non-potable use, further treating it with several advanced treatment processes and adding it to an untreated surface water or groundwater supply. This water may be subject to further treatment or disinfection in order to meet potable water standards.

The Assembly was supportive of exploring indirect potable reuse. Concerns over the health effects of small concentrations of contaminants that might be left in the product water after extensive treatment must be addressed. One of the opportunities for reusing water is to further treat wastewater from the North City and South Bay Reclamation Plants for indirect potable reuse. This opportunity, however, carries some of the greatest challenges.

Experts and members of the public alike agreed that multiple barriers of treatment between the recycled water source and the potable use option are crucial for protecting public health and for increasing public acceptance. It is important that a time element be included in any potable reuse option so that the monitoring system in place can detect any changes in treatment efficiency and preclude water that may not meet internal goals or regulatory requirements from entering the potable system. Also, detention times in groundwater aquifers and surface water reservoirs are important issues that the study shall consider.

Extensive and systematic monitoring systems are needed to ensure compliance with regulations and to reassure the public that the quality of the potable reuse product is maintained at all times. A sophisticated monitoring system should be considered part of a good insurance policy for the success of the reuse projects and the results should be made public frequently.

Surface Water Opportunities. The Reuse Study must identify opportunities and constraints for using purified water to augment existing surface water reservoirs. The Study should also consider the creation and enhancement of wetlands upstream of a surface water reservoir to further enhance the water's quality through natural treatment prior to its entry into the reservoir.

Groundwater Opportunities. The Reuse Study shall identify opportunities and constraints for delivering purified water to local groundwater basins for subsequent extraction and use as a potable water supply. These evaluations shall consider the possible use for reclaimed water to create seawater intrusion barriers. The evaluations shall also address options for moving water into the groundwater basin, including spreading and injection/extraction operations.

Direct Potable Reuse

Direct Potable Reuse Opportunities. Direct potable reuse would entail the use of purified water followed by distribution in the potable supply system without any intervening natural treatment such as through a wetland or percolation into a groundwater basin. While direct potable reuse is currently prohibited in California (although it is practiced elsewhere), there was some sentiment from the American Assembly to include this as a future option. There are public health and safety reservations among some of the participants regarding direct potable reuse.

100% Direct Potable Reuse Opportunities. The study shall address upgrade requirements for all existing water reclamation plants to produce only water that meets direct potable reuse requirements. The study shall consider the cost differential between installing and maintaining a dual distribution system (including dual meters) vs. upgrading the existing reclamation facilities to produce potable water.

V. Public Outreach and Education

The Assembly delegates viewed public outreach and education as a critical component of any future City water reuse effort. They felt that it was important for residents to know the source and quality of their water and have a basic understanding of how recycled water fits into San Diego's local water supply. There was consensus that education is a key aspect to achieving public acceptance of increased water reuse. Further, the group felt that a flexible, aggressive and multi-dimensional education and outreach strategy is needed.

The Assembly delegates indicated that an effective education and outreach program must be included in school curricula (K-12 and college), involve the media, neighborhood and community groups and provide information on water use, sources and availability, water conservation, and the full water cycle (source, treatment, usage, treatment, discharge, reuse). Colorado River and California Aqueduct water quality must be compared to potable, recycled and purified water quality. Also, the group thought that showcasing local reclaimed water projects and facilities, as well as water treatment plants, would be a positive technique.

The Assembly delegates expressed concern over terminology such as "reuse", "recycling", "repurification", and "reclaimed water", noting that the "re-" component in these words had possible negative connotations. The delegates suggested that the City consider using alternative terminology in their public outreach program.

VI. Appendix

Investigations

The Assembly noted special investigations that should be conducted in the evaluation of the alternatives. These investigations included:

- Case Studies – the experiences of other communities that have undertaken various types of recycled water projects should be assessed. This includes any positive or negative experiences. Treatment technology used, risk issues and how they were dealt with, economics, public acceptance and other issues should be documented.

- Latest treatment studies – the assessment should consider the latest advancements in water treatment technology including cost, effectiveness, risks, etc.

- Grant funding – the Assembly believes that external funding should be leveraged to minimize the rate impact on ratepayers.

- Beneficiaries – the Assembly is interested in an evaluation of the beneficiaries of particular alternative courses of action. For example, decision to construct a particular project/approach might have benefits to labor, manufacturers, builders, etc. and these should be outlined.

- Biological effects/live stream discharge – wetlands creation may inundate areas that are not naturally inundated year round affecting species that require periodic dry conditions. This must be considered in the assessment of wetland creation opportunities.

Glossary

Avoided costs: The cost savings that may accrue to the City if a given water reuse project delays or eliminates the need for a water or wastewater system improvement

project. For example, a reuse project might meet enough of a growing communities peak summer water supply to eliminate the need for a new water system pipeline that would otherwise be needed.

Contaminant: A substance in the water that is of public health or welfare concern; also an undesirable substance not normally present or an unusually high concentration of a naturally occurring substance. (E.g. viruses, bacteria, pathogens, antibiotics, hormones, dissolved minerals, including salts)

Costs: The capital and operating costs of building and operating a given water reuse project. Capital costs are the initial cost to design and construct project facilities. Operating costs are the ongoing annual costs of operating the project, including labor and material costs for operations and maintenance and energy costs for pumping.

Costs of Inaction: The Assembly delegates want make sure the study considers the costs to the City of not implementing reuse projects. These costs include the costs of obtaining other water supplies.

Direct potable reuse: The addition of advanced treated recycled water (purified water) directly to the potable water distribution system.

Firm supply: Water supplies are called firm if they are reliable both legally and hydrologically. For example, some surface water supplies are subject to reduction during dry years and therefore cannot be counted on as firm supplies. Reclaimed water is usually considered to be a firm source of supply because it remains available even under during dry years.

Gray water: Wastewater from a household or small commercial establishment that does not include water from a toilet, kitchen sink, dishwasher or water used for washing diapers.

Indirect potable reuse: The addition of advanced treated recycled water (purified water) to a natural water source (groundwater basin or reservoir) that could be used for drinking water after further treatment.

Multiple treatment barriers: A series of physical or chemical treatment processes that are expected to provide substantial protection to public health by assuring that the water treatment process remains effective even if one treatment barrier fails.

Operational reliability: The reliability of the City's water treatment and distribution systems to avoid upsets and to continue to serve customers even with individual system elements out of service for maintenance or repair.

Purified water**:** Recycled water treated to an advanced level suitable for augmentation to a drinking water source.

***Recycled water*:** (same as Reclaimed water) The end product of wastewater reclamation that meets water quality requirements for biodegradable materials, suspended matter, and pathogens. This water meets appropriate water quality requirements and is reused for a specific purpose.

Supply Reliability: The reliability of the City's combined sources of supply under a variety of hydrologic and other conditions.

Equivalencies

1 Hundred Cubic Feet (HCF) = 0.002 Acre Feet (AF) = 748 gallons

1 AF = 435.6 HCF

1 AF = 43560 cubic feet (cf)

1 AF = 326,000 gallons

1 cf = 7.48 gallons

1 million gallons per day (mgd) = 1120 AF per year

1 AF is approximately the amount of water needed to serve two families of four for a year.

One family of four would typically use 18 HCF per month, or 450 gallons per day.

Attendees

Water Reuse Study 2005
American Assembly I Participants

First Name	Last Name	Group Represented
Armando	Abad	Naval Facilities Engineering Command
Greg	Alabado	Mayor's Advisory Board
Elaine	Allen	San Diego Association of Realtors
Joseph	Arlotto	Zoological Society of San Diego
Diana	Bergen	UCSD
Bobbette	Biddulph	Association of Environmental Professionals
Betsy	Brennan	Community Representative CD-1
Vernon	Brinkley	Skyline/Paradise Hills Planning Committee
Lee	Campbell	Community Representative CD-7, Tierrasanta Community Council
Roger	Cazares	Mayor's Advisory Board
Herman	Collins	State Recycled Water Task Force - Public Education Sub-Committee and Collins Strategic Group
Brian	Cooney	Community Representative CD-3
Dr. Aurora	Cudal	Council of Philippine American Org. of San Diego County
Bush	Cze	Mayor's Advisory Board
Betty	Dehoney	Association of Environmental Professionals
George	Diefenthal	Community Representative CD-3, Talmadge Maintenance Assessment District
Bishop Roy	Dixon	Community Representative CD-4
James	Endicott	San Diego Association of Realtors
Ed	Fletcher	Mayor's Advisory Board
Lois	Fong-Sakai	Asian Business Association
Terese	Ghio	Community Representative CD-1, BIOCOM
Marco	Gonzalez	Community Representative CD-6, San Diego Bay Council
Dawn	Guendert	San Diego Regional Chamber of Commerce
Dr. Gerald	Handler	Community Representative CD-1
W. William	Harvey	Community Representative CD-2
Kathy	Haynes	American Society of Civil Engineers
Rob	Hutsel	San Diego River Park Foundation
Bill	Jacoby	San Diego County Water Authority
Ed	Kimura	Sierra Club
Ben	Kline	Industrial Environmental Association
Josh	Knoefler	Community Representative CD-1, San Diego Regional Chamber of Commerce
Michelle	Krug	Community Representative CD-4
Walter	Lam	Alliance for African Assistance
Tiong	Liem	Asian Business Association
Jose	Lopez	Community Representative CD-7, Neighborhood Association Fox Canyon

First Name	Last Name	Group Represented
Joni T.	Low	Community Representative CD-5
Yolanda	Lujan	Community Planning Group CD-4
Richard	Lujan	Community Planning Group CD-4
Fred	Maas	Community Representative CD-1, Black Mountain Ranch
Andrew	Manzi	Community Representative CD-6
Brian	Maynard	California Landscape Contractors Association
Shawn	McMillan	Taiwanese Chamber of Commerce
Richard	Miner	Community Representative CD-3, Cherokee Point Resident
Chuck	Morgan	UCSD
Wayne	Nelson	Otay Mesa/Nestor Planning Committee
Dr. Joseph	Parker	Mayor, CWA Boardmember
Jim	Peugh	Community Representative CD-2, San Diego Audobon Society
Ken	Richardson	San Diego Regional Chamber of Commerce
Cathy	Ripka	Community Representative CD-5
Steven	Satz	Community Representative CD-3, Uptown Planners
E. Javier	Saunders	Mayor, CWA Boardmember
Glen	Schmidt	American Society of Landscape Architects
Catherine	Strohlein	Community Representative CD-2, Pacific Beach/Mission Bay Planning Committee
Judy	Swink	Community Representative CD-2, Mission Bay Park
Fred	Thompson	Mayor, CWA Boardmember
Yen	Tu	Mayor, CWA Boardmember
Claudia	Unhold	Community Representative CD-5, Miramar Ranch North Planning Committee
Muriel	Watson	Revolting Grandmas
Simon	Wong	Asian Business Association

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Observers

First Name	Last Name	Group Represented
Dr. Rick	Gersberg	Independent Advisory Panel and San Diego State University School of Public Health
Ron	Linsky	National Water Research Institute - formed the Independent Advisory Panel
Tom	Richardson	RMC – representative for Bay Council
Mike	Thornton	San Diego Elijo JPA
Fred	Zuckerman	Independent Advisory Panel and Tierrasanta Community Council