THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Office of the General Counsel

VIA E-MAIL

December 12, 2016

Director Michael T. Hogan
Director Keith Lewinger
Director Elsa Saxod
Director Fern Steiner
San Diego County Water Authority
4677 Overland Avenue
San Diego, CA 92123

Re: Your letter dated November 5, 2016 regarding Board Agenda Item 7-6 (Water Savings Incentive Plan Agreements with Tri-Star Dyeing and Finishing Inc.)

Dear Directors Hogan, Lewinger, Saxod, and Steiner:

This letter responds to your November 5, 2016 letter opposing November Board Item 7-6. (Attachment 1) In that letter, SDCWA's representatives on Metropolitan's Board state their opposition to Board Letter 7-6 and its proposed action item

Metropolitan responds to SDCWA's blanket and erroneous assertions that Metropolitan's rates and programs are illegal and its other arguments:

1. Metropolitan has complied with all applicable laws in connection with setting rates. The rates reflect reasonable and fair allocations of the costs of supplying service. We acknowledge the decision of the trial court in the 2010 and 2012 rate litigation. However, as you know, we disagree with and have filed an appeal challenging the determination of that court. Moreover, as we have pointed out in the pending appeal, Proposition 26 is inapplicable to wholesale water agencies like Metropolitan and exempts reasonable rates for services. While the appeal is pending, the trial court decision has no legal effect.

The ultimate determination of the legality of Metropolitan's rates in general or any particular rate component will not impact the Water Savings Incentive Plan agreement. The agreement approved by Metropolitan's Board requires Metropolitan to pay incentives of up to $692,000 for the proposed project that is estimated to save about 3,540 acre-feet of water over a ten-year period. The source of the funds to make the required payments will be determined by Metropolitan as part of its regular and ongoing review of revenue requirements.

SDCWA has recognized this fact. In November 2009, when SDCWA was seeking approval from the Metropolitan Board for funding the Carlsbad Seawater Desalination Plant and concerns were expressed by some member agencies that SDCWA may challenge the legality of the Water Stewardship Rate ("WSR"), Director Lewinger, speaking in support of Metropolitan's funding and in opposition to the inclusion of proposed restrictive language in the contract, stated:

> "The argument that the General Managers [of certain member agencies] make, that we're gonna do away with the Stewardship Fee and that somehow jeopardizes the ability to pay for the local resource projects is a fallacy. The Board of Directors in its fiduciary responsibility must evaluate the commitments we've made, and how we are going to fund those commitments. We may do it differently in the future than we've done it in the past, but we're going to have to raise enough money to fund those commitments."

(Attachment 2, Transcript of November 9, 2009 Water Planning and Stewardship Committee meeting, pgs. 21-22)

2. Your assertion that the sole beneficiaries of Item 7-6 are Tri-Star Dyeing and Finishing Inc. and Central Basin Municipal Water District is incorrect and ignores the regional benefits from this and other demand management programs. Metropolitan has shown that demand management programs benefit all member agencies regardless of project location. The programs provide benefits to all member agencies because they help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on the District's infrastructure and reduce system costs, and free up conveyance capacity to the benefit of all system users. This information is detailed in the materials that have been provided to the Board over several years. The attached portions of Metropolitan's budget and cost of service report for fiscal years 2016/17 and 2017/18 provide examples. (Attachment 3)

SDCWA's assertions of lack of regional benefit and legality are another change in position by SDCWA. When Metropolitan was considering the proposed agreement to provide funding to SDCWA for the Carlsbad Seawater Desalination Plant, SDCWA Board Chairman Claude "Bud" Lewis argued for the regional benefit of the project in an October 13, 2009 letter to Metropolitan's Board Chairman (cc'g both Boards, the California Governor, and certain Legislators) (Attachment 4) as follows:

- "final action [is] needed to deliver this highly reliable water supply project to Southern California";
- "this project helps implement MWD's 2004 Integrated Resources Plan";
- the project "will provide 56,000 acre-feet of reliable water annually within the MWD service territory at a time when we most need it";

- the project will reduce SDCWA's water supply allocation and so "means more water for all of MWD's other member agencies";
- "The Water Authority urges the MWD board to approve the SDP agreement in November so that this important regional water supply project can proceed."

Significantly, SDCWA funds local resource development within its service area based on the regional benefit of such projects. SDCWA's 2015 cost of service study for 2016 rates and charges states:

> "**Local Water Supply Development**: This is the cost to implement local water supply projects within the Water Authority's service area in order to provide a long-term reliable and sustainable supply. The cost is recovered through the Customer Service charge to recognize the general regional benefit."

(Attachment 5, pg. 15) Carollo Engineers, which performed the study, stated SDCWA's rates and charges are reasonable, consistent with industry best practices, and "adhere to legal requirements." (Attachment 5, pg. 37)

3. SDCWA's argument that Metropolitan has judicially admitted that there are no regional water supply benefits is, as SDCWA knows, untrue. Metropolitan has shown that conservation provides benefits to the region. Metropolitan's judicial filings in the SDCWA litigations are entirely consistent with Board Letter 7-6 and other material provided to the Metropolitan Board addressing such benefits. In other SDCWA letters also dated November 5, 2016, SDCWA relied on Appellants' Opening Brief at pages 80-81 (in footnote 1) for this misplaced assertion. The language quoted by SDCWA simply addresses the trial court's error in concluding that the WSR does not recover a transportation-related cost.

In its brief, Metropolitan explained that conservation and local water development projects create a local supply, not a Metropolitan supply. The increase in supply at the local level reduces the demand for imported water supplies and decreases the burden on Metropolitan's infrastructure, thus reducing system costs and freeing up conveyance capacity to the benefit of all system users. Metropolitan's argument in the brief that you cite is that such costs are properly allocated to Metropolitan's *transportation* costs, as they provide system-wide transportation benefits. The financial impact on Metropolitan is avoided transportation costs that would otherwise be collected through transportation rates paid by all users of the system. This is a validated concept embraced by the U.S. Environmental Protection Agency and others. (Attachment 6)[1] Overall,

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[1] The EPA's 2002 report titled "Cases in Water Conservation: How Efficiency Programs Help Water Utilities Save Water and Avoid Costs," for example, states: "Water utilities across the

the decrease in demand resulting from Metropolitan's demand management programs is estimated to have resulted in transportation cost savings of approximately $2.7 billion in 2015 dollars. (Attachment 7) Metropolitan's position is far from an admission that demand management programs create benefits only to the project participant; it is the opposite. We have attached a more complete excerpt of this brief for your review and to avoid any misunderstanding. (Attachment 8)

Contrary to the argument in your letter, it is SDCWA that has changed its position related to demand management programs. As noted in our prior correspondence, SDCWA and participants in its service area have requested and have been the recipient of millions of dollars of demand management benefits; for example:

- From July 2011 through February 2016, $68,022,345 in conservation benefits was paid to participants in the SDCWA service area, including turf removal rebates. (Attachment 9 and its Attachment 3) This included 23 percent of the turf removal rebates funded by Metropolitan between July 2014 and February 2016. SDCWA did not object to these payments and did not ask Metropolitan to not provide such benefits to consumers in its service area.

- From inception of Metropolitan's conservation program through February 2016, the SDCWA service area received $128,086,053 in conservation payments, second only to Los Angeles. (Attachment 9 and its Attachment 3) These benefits were funded through Metropolitan's rates by all of Metropolitan's member agencies.

With two exceptions, the SDCWA delegation on the Metropolitan Board voted in favor of all of Metropolitan's demand management programs and contracts from 1991 until May 2010, immediately prior to filing the 2010 rate litigation. (Attachment 9 and its Attachment 1)

4. SDCWA states (based upon its own projections) that the project approved in Item 7-6 is not needed and that there is no need to "free up capacity" in Metropolitan's transportation system because Metropolitan's transportation system has and will have excess capacity in the future. Metropolitan's goal-setting forecasts and projections are based on thorough study, such as contained in its Integrated Resources Plan Update and Urban Water Management Plan. SDCWA is, of course, entitled to its own views of the adequacy of water supplies in the Metropolitan

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United States and elsewhere in North America are saving substantial amounts of water through strategic water-efficiency programs. These savings often translate into capital and operating savings, which allow systems to defer or avoid significant expenditures for water supply facilities and wastewater facilities." The EPA offers Metropolitan as a case study, concluding: "Conservation efforts have considerably reduced the cost estimate of Metropolitan's capital-improvement." (Attachment 6, EPA report's pgs. 2 and 4)

service area. But SDCWA's disagreement with Metropolitan's projections provides no basis for disclaiming financial and contractual responsibility for Board actions.

5. SDCWA asserts that Metropolitan "misconstrues the legislative mandate of SB 60." SDCWA is wrong. The Metropolitan Water District Act, a state statute, expressly directs Metropolitan to "expand water conservation, water recycling and groundwater recovery efforts" and "place increased emphasis on sustainable, environmentally sound, and cost-effective water conservation, recycling, and groundwater storage and replenishment measures." Metropolitan's conservation and local resource programs, including adopting and approving actions such as described in Board Letter 7-6, comply with this legislative mandate.

6. In your November 5 Letter re Item 7-6 and in other recent communications to Metropolitan, and statements in Committee and Board meetings, SDCWA representatives have stated that the WSR "has already been ruled an illegal tax." This statement does not accurately reflect what was litigated.

In its Petitions/Complaints in the 2010 and 2012 cases, SDCWA sought invalidation of the WSR only on the basis that it should be a supply rate rather than a transportation rate. The trial court decision was that there was not sufficient evidence in the applicable administrative record to support allocating 100 percent of the WSR to transportation rates. The court's rationale was that the allocation was unfair to wheelers.

The trial court invalidated the WSR only as adopted in 2010 and 2012, and only on this basis. This ruling is on appeal. The trial court did not find that the WSR was invalid when paid as part of the full service rate, nor that it was invalid in any other year, nor that it would be invalid under a different administrative record. SDCWA did not contend, and the trial court did not rule, that the WSR is an illegal tax per se. These points are clear from the attached portions of the trial court's decision. (Attachment 10)

In addition, as noted and as SDCWA is well aware, because the trial court's decision is on appeal (by both parties), it is not final and has no legal effect. For this further reason, Metropolitan is not funding the proposed project with an "illegal" rate.

Sincerely,

Gary Breaux
Assistant General Manager/
Chief Financial Officer

Marcia Scully
General Counsel

cc: Metropolitan Board of Directors and Member Agencies
Metropolitan General Manager Jeff Kightlinger
SDCWA Board of Directors
SDCWA Board Secretary Melinda Cogle

Attachments

Attachment 1

San Diego County Water Authority
4677 Overland Avenue • San Diego, California 92123-1233
(858) 522-6600 FAX (858) 522-6568 www.sdcwa.org

November 5, 2016

Randy Record and
Members of the Board
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, CA 90054-0153

RE: Board Memo 7-6: Adopt CEQA determination and authorize entering into a Water Savings Incentive Plan Agreements with Tri-Star Dyeing and Finishing Inc. -- **OPPOSE**

Chairman Record and Members of the Board:

The Water Authority and its member agencies have a strong record of leadership in water conservation planning resulting in implementation of fiscally responsible programs and policy implementation. Since the early 1990s, the San Diego region's per capita water use has dropped by almost 40 percent. We recently launched a "Live WaterSmart" public outreach campaign to ensure the San Diego region continues water use efficiency as a positive and permanent ethic. While we strongly support water conservation, we oppose Board Memo 7-6, for both legal and policy reasons.

On the legal side, we oppose this board action because the proposed source of funding is MWD's Water Stewardship Rate, which has already been ruled an illegal tax, and invalidated by the San Francisco Superior Court.[i] More generally, Board Memo 7-6 makes very broad, unsupported claims about the Water Savings Incentive Program (Program) and this project (Project), including that it:

> "benefits all member agencies regardless of project location, helps to increase regional water supply reliability within Metropolitan's entire service area, reduce demands for imported water supplies, decrease the burden on the district's infrastructure and reduce system costs, and free up conveyance capacity to the benefit of all system users. In addition, this program helps Metropolitan meet its legislative mandates under SB 60 to expand water conservation, recycling, and groundwater storage and replenishment measures."

However, MWD offers no evidence of such broad regional benefits; to the contrary, Board Memo 7-6 shows on its face the specific private business and member agency that will benefit from the $692,000 cost proposed to be incurred by MWD, namely, Tri-Star Dyeing and Finishing Inc. and Central Basin Municipal Water District (Central Basin). Contrary to the statements contained in Board Memo 7-6, MWD has judicially admitted that the Program benefits only the individual member agencies, and in this case, a private business -- not the MWD service area generally. Similarly, MWD has failed to demonstrate any need to "free up system capacity" or that this particular local water supply project will achieve that in any measurable way. [ii]

On the policy side, as stated in previous letters, we believe MWD is not only capable of developing, but has a responsibility to develop water conservation programs that are more than just very expensive "gimmicks"[iii] -- programs that measure performance benefits, are fiscally responsible and are paid for with a lawful funding source. We objected to passage of Minute Items 48772, 49068 and 49542 because MWD's current conservation planning fails to accomplish these objectives. Rather than self-defining its role as a financing agency, MWD should focus on the real mandate of SB 60, namely, developing a water supply plan that reduces the region's demand for water from the Bay Delta in a quantifiable, measurable way.[iv]

Sincerely,

Michael T. Hogan	Keith Lewinger	Elsa Saxod	Fern Steiner
Director	Director	Director	Director

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[i] See August 12, 2016 letter RE Board Memo 8-1: Adopt CEQA determination and authorize entering into Water Savings Incentive Plan Agreements with Dye Finishing Companies - OPPOSE, incorporated herein by reference.

[ii] The Water Authority has presented letters OPPOSING Board Memos 7-2, 7-3, 7-4 and 7-5 on this month's Water Planning and Stewardship and Board meeting agendas. Those letters, and each and every basis of the Water Authority's objections to the proposed board actions, are incorporated herein by reference.

[iii] MWD conservation programs have garnered some troubling attention that could ultimately prove to be counterproductive to achieving near and long-term conservation objectives. See, for example, *Grass Warfare in L.A., Some well-intentioned Angelenos traded grass for gravel on their front lawns. It got ugly,* https://www.bloomberg.com/features/2016-turf-terminators-grass-war/.

[iv] As noted in the Water Authority's letters in footnote ii above, MWD misconstrues the legislative mandate of SB 60 (Hayden) as one that requires it to pay for local water supply development by individual member agencies. Even that were the primary purpose of the bill, which is was not, MWD would still be required to meet cost of service legal requirements including the Constitutional limitations of Proposition 26.

Attachment 2

AUDIO TRANSCRIPTION OF

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

WATER PLANNING AND STEWARDSHIP COMMITTEE MEETING

November 9, 2009

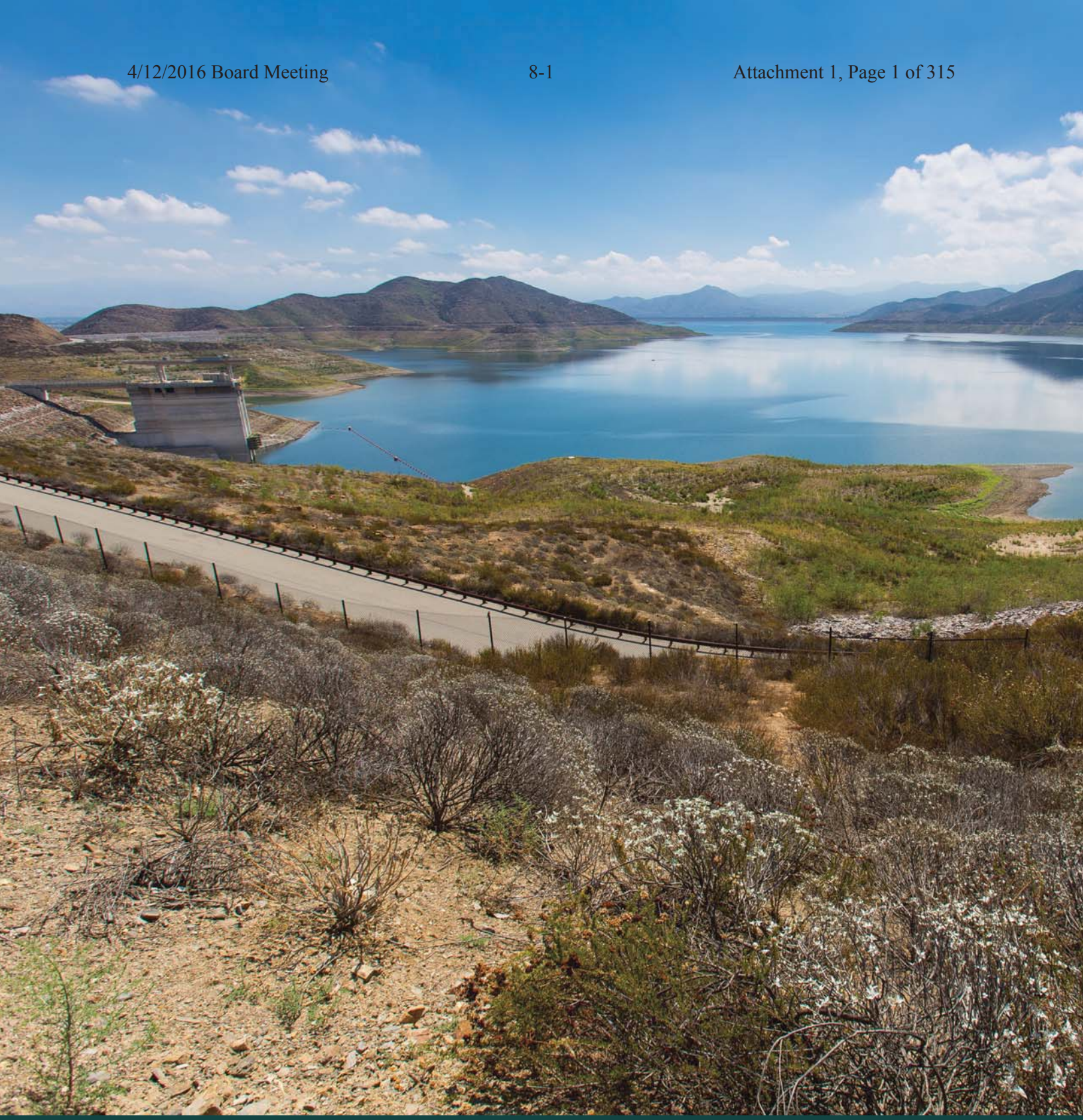
ATKINSON-BAKER, INC.
COURT REPORTERS
(800) 288-3376
www.depo.com

TRANSCRIBED BY: MARY HARLOW
FILE NO. A707397

1 signed the letter, 'Well, we've entered in - if we
2 enter into this agreement, what's the guarantee that
3 we're going to have the funding supply in the future
4 to cover this ex-- added expense?' Well, the same
5 question could be asked of the 91 agreements that have
6 been previously entered into, and the 1.2 billion
7 dollars that Metropolitan has a commitment to.
8 When the Board of Directors looks at changing
9 its rate structure, it has to take all of these
10 factors into consideration. We have to look at all of
11 the commitments we've made to pay bills. We're going
12 to have to pay our State Water Project costs. We
13 don't have an option to opt out of that. We're going
14 to have to pay our bonds. We don't have an option to
15 opt out of that. We have to pay our employees. We
16 don't have an option to just get rid of all of 'em.
17 And we're gonna have to pay for the contractual
18 commitments that we've entered into.
19 So when the Board of Directors in the future
20 discusses changes in the rate structure, part of that
21 discussion must be, how are we going to fund the
22 commitments that we have entered into. The argument
23 that the General Managers make, that we're gonna do
24 away with the Stewardship Fee and that somehow
25 jeopardizes the ability to pay for the local resource

1 projects is fallacy. The Board of Directors in its
2 fiduciary responsibility must evaluate the commitments
3 we've made, and how we are going to fund those
4 commitments. We may do it differently in the future
5 than we've done it in the past, but we're going to
6 have to raise enough money to fund those commitments.
7 Thank you.
8 VICE CHAIRMAN PETERSON: Thank you. Director
9 Edwards?
10 DIRECTOR EDWARDS: Well, I'd like to second
11 John Morris's motion.
12 VICE CHAIRMAN PETERSON: Okay. That's it?
13 DIRECTOR EDWARDS: That's it.
14 VICE CHAIRMAN PETERSON: Okay. Director
15 Lowenthal?
16 DIRECTOR LOWENTHAL: Anything else?
17 MALE DIRECTOR: Well, (indiscernible).
18 DIRECTOR LOWENTHAL: You sure?
19 MALE DIRECTOR: (indiscernible)
20 MALE DIRECTOR: Why?
21 DIRECTOR LOWENTHAL: Thank you, Mr. Chairman,
22 and I appreciate the motion that's been made. I
23 think, in listening to the speakers and also what our
24 own Board grapples with when it comes to business
25 practices and commitments, you know, while we are in

Attachment 3, Part 1



PROPOSED BIENNIAL BUDGET

Fiscal Years 2016/17 and 2017/18

Realizing the Benefit of Sound Investments

DEMAND MANAGEMENT

OVERVIEW

Demand Management costs are Metropolitan's expenditures for funding local water resource development programs and water conservation programs. These demand management programs incentivize the development of local water supplies and the conservation of water to reduce the reliance on imported water. These programs are implemented after the service connection between Metropolitan and its member agencies and, as such, do not add any water to the quantity Metropolitan obtains from other sources or to Metropolitan's own supply. Rather, the effect of these downstream programs is to produce a local supply of water for the local agencies.

Demand Management programs reduce the use of and burden on Metropolitan's distribution and conveyance system, which, in turn, helps reduce the capital, operating, maintenance and capital improvement costs associated with these facilities. For example, local water resource development and conservation has deferred the need to build additional infrastructure such as the Central Pool Augmentation Project and the San Diego Pipeline No. 6. Overall, the decrease in demand resulting from these projects is estimated to defer the need for projects between four and twenty-five years at a savings of between $324 and $910 million. The programs also free up capacity in Metropolitan's system to convey both Metropolitan water and water from other non-Metropolitan sources.

The budgeted costs for Demand Management are as follows:

Demand Management Cost Summary[1], $ millions

	2014/15 Actual	2015/16 Budget	2016/17 Proposed	Change from 2015/16	2017/18 Proposed	Change from 2016/17
Conservation Credits Program	$134.4	$20.0	$27.0	$7.0	$32.0	$5.0
Local Resources Program	$35.8	$41.7	$43.7	$2.0	$41.9	$(1.8)
Future Supply Actions		0	$4.4	$4.4	$2.0	$(2.4)

[1] Does not include Departmental costs reflected elsewhere in this Budget.

Budgeted Demand Management costs reflect increasing the financial commitment for the Conservation Credits Program and maintaining the financial incentives for existing contracts under the Local Resources Program.

In addition to Metropolitan's own objectives, Metropolitan also pursues local water resource development because it has uniquely been directed to do so by the state Legislature. In 1999, then Governor Davis signed Senate Bill (SB) 60 (Hayden) into law. SB 60 amended the Metropolitan Water District Act to direct Metropolitan to increase conservation and local resource development. No other water utility in California, public or private, has been specifically identified by the state Legislature and directed to pursue water conservation and local water resource development.

Metropolitan's Demand Management programs also support the region's compliance with the requirements of SB X7-7. In 2009, the state Legislature passed SB X7-7, which was enacted to reduce urban per capita water use by 20 percent by December 31, 2020. Urban retail water suppliers are not eligible for state water grants or loans unless they comply with the water conservation requirements of the legislation. Demand Management programs help the region achieve urban per capita water use reductions.

Demand Management costs also support the Strategic Plan Policy Principles approved by Metropolitan's Board on December 14, 1999. These principles embody the Board's vision that Metropolitan is a regional provider of wholesale water services. In this capacity, Metropolitan is the steward of regional infrastructure and the regional planner responsible for coordinated drought management and the collaborative development of additional supply reliability and necessary capacity expansion. Through these regional services, Metropolitan ensures a baseline level of reliability and quality for service in its service area.

DEMAND MANAGEMENT PROGRAMS REDUCE RELIANCE ON IMPORTED WATER

Metropolitan increased the emphasis on Demand Management programs after the devastating drought of the early 1990's. Metropolitan's 1996 Integrated Resources Plan identified the Preferred Resource Mix as the resource plan that achieved the region's reliability goal of providing the full capability to meet all retail-level demands during all foreseeable hydrologic events, represented the least-cost sustainable resources plan, met the region's water quality objectives, was balanced and diversified and minimized risks, and was flexible, allowing for adjustments should future conditions change.

The Preferred Resource Mix included locally developed water supplies and conservation, and recognized that regional participation was important to achieve their development. Additional imported supplies frequently have relatively lower development costs, but can create a large cost commitment for regional infrastructure to transport and store those imported supplies. On the other hand, local projects, like those designed to recycle water or increase groundwater production, may have higher development costs but require little or no additional infrastructure to distribute water supplies to customers. This trade-off between relatively lower-cost imported supplies requiring large regional infrastructure investments and relatively higher-cost local supply development requiring less additional local infrastructure was an important consideration in the development of the Preferred Resource Mix. A strategy of aggressively investing in imported water supply would lead to higher costs for the region because of the larger investments required in infrastructure. Since 1996, the Integrated Resources Plan has been updated twice, in 2004 and 2010, reaffirming long-term sustainability of the region's water supply through implementation of conservation and local resource development.

DEMAND MANAGEMENT PROGRAMS REDUCE DEMANDS AND BURDENS ON METROPOLITAN'S SYSTEM

Demand Management programs decrease and avoid operating and maintenance and capital improvement costs, such as costs for repair of and construction of additional or expanded water conveyance, distribution, and storage facilities. The programs also free up capacity in Metropolitan's system to convey both Metropolitan water and water from other non-Metropolitan sources.

The purpose of Demand Management is to generate additional local resources or reduce consumption through conservation, which reduces the amount of water that must otherwise be transported through Metropolitan's system. Investments in Demand Management programs like conservation, water recycling and groundwater recovery help defer the need for additional conveyance, distribution, and storage facilities. Demand Management is an important part of Metropolitan's resource management efforts. Metropolitan's

incentives in these areas contribute to savings for all users of the system in terms of lower capital costs that would otherwise have been required to expand and maintain the system.

SB 60 DIRECTED METROPOLITAN TO EXPAND DEMAND MANAGEMENT PROGRAMS

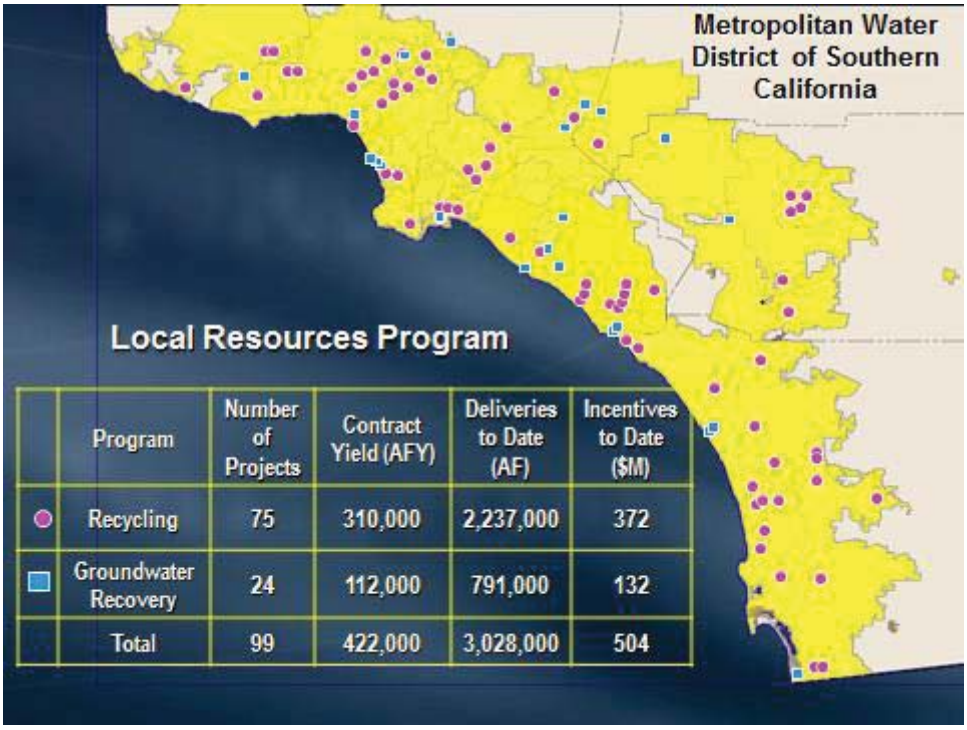
In September 1999, Governor Gray Davis signed SB 60 (Hayden) into law. SB 60 amended the Metropolitan Water District Act to direct Metropolitan to increase "sustainable, environmentally sound, and cost-effective water conservation, recycling, and groundwater storage and replenishment measures." SB 60 also requires Metropolitan to hold an annual public hearing to review its urban water management plan for adequacy in achieving an increased emphasis on cost-effective conservation and local water resource development, and to invite knowledgeable persons from the water conservation and sustainability fields to these hearings. Finally, Metropolitan is required to annually prepare and submit to the Legislature a report on it progress in achieving the goals of SB 60. SB 60 specifically indicated that no reimbursement was required by legislation because Metropolitan, as a local agency, has the authority to levy service charges, fees or assessments sufficient to pay for the program or level of service mandated by SB 60. No other water utility in California, public or private, has been specifically identified by the state Legislature and directed to pursue water conservation and local water resource development.

In FY 2014/15 alone, Metropolitan's service area achieved 1.5 million acre-feet of water savings from conservation, recycled water and groundwater recovery programs. The 1.5 million acre-feet of water savings from water management activities in fiscal year 2014/15 nearly equaled actual water sold in the same period of 1.91 million acre-feet. These savings derived from programs for which Metropolitan paid incentives, as well as code-based conservation achieved through legislation, building and plumbing codes and ordinances, and reduced consumption resulting from changes in water pricing. Cumulatively, since 1990 Metropolitan has invested almost $1 Billion to achieve water savings.

Metropolitan's Conservation Credits Program provides incentives to residents and businesses for use of water-efficient products and qualified water-saving activities. Rebates have been provided to residential customers for turf removal and purchasing of high-efficiency clothes washers and toilets. Rebates are also provided to businesses and institutions for water-saving devices. In fiscal year 2014/15, the Conservation Credits Program achieved 944,000 acre-feet of saved water through new and existing conservation initiatives funded with incentives and maintained through plumbing codes. Cumulatively, through fiscal year 2014/15 the Conservation Credits Program has achieved over 2.2 million acre-feet of water savings.

Metropolitan provides financial incentives through its Local Resources Program for the development and use of recycled water and recovered groundwater. The Local Resources Program consists of 75 recycling projects and 24 groundwater recovery projects located throughout Metropolitan's service area, of which 85 projects are in operation. From the Local Resources Program's inception in 1982 through FY 2014/15, Metropolitan has paid out about $372 million in incentives to produce about 2.2 million acre-feet of recycled water. Metropolitan also provided approximately $132 million to produce 791,000 acre-feet of recovered degraded groundwater for municipal use.

Local Resources Program Projects



	Program	Number of Projects	Contract Yield (AFY)	Deliveries to Date (AF)	Incentives to Date ($M)
●	Recycling	75	310,000	2,237,000	372
■	Groundwater Recovery	24	112,000	791,000	132
	Total	99	422,000	3,028,000	504

SB X7-7 REQUIRES INCREASED CONSERVATION

SBX7-7 mandated a new requirement to lower urban per capita water use 20 percent by December 31, 2020. Enacted by the state Legislature and signed into law by Governor Schwarzenegger as part of a historic package of water reforms in November 2009, the "20x2020" plan gave local communities flexibility in meeting this target while accounting for previous efforts in conservation and recycling. The Legislature found that reducing water use through conservation and regional water resources management would result in protecting and restoring fish and wildlife habitats, reducing dependence on water through the Delta, and providing significant energy and environmental benefits. Metropolitan coordinates closely with its member agencies to achieve these targets both at a retail agency level in compliance with legislative requirements, and as a region in achieving a true 20 percent reduction in per-capita water use.

BUDGET HIGHLIGHTS

The budget for the Demand Management costs is increasing slightly when comparing the biennial budget to FY 2015/16, due primarily to increased expenditures for the Conservation Credits Program.

Attachment 3, Part 2

Metropolitan Water District of Southern California

FISCAL YEARS 2016/17 and 2017/18 COST OF SERVICE FOR PROPOSED WATER RATES AND CHARGES

Table 17: Functional Allocation of Metropolitan Storage Facilities

	Functional Allocations		
Storage Facilities	Emergency	Drought	Regulatory
Diamond Valley Lake	50%	45%	5%
Other Regulatory			100%
Lake Skinner	77%		23%
Lake Mathews	44%		56%
Semi-Tropic		100%	
Arvin-Edison		100%	
CRA Off-Stream		100%	
Groundwater Conjunctive Use		100%	

(a) DVL allocations are based on modeled changes in year-end reservoir levels (2004-2009) as relative to capacity and emergency storage criteria

(b) Lake Skinner and Lake Matthews allocation percentages are derived from Southern California's Integrated Water Resources Plan, March 1996, Volume 2 "Metropolitan's System Overview", Section 4, p. 10, Table 4-3.

Treatment

This function includes capital financing, operating, maintenance, and overhead costs for Metropolitan's five treatment plants and is considered separately from other costs so that the treatment function may be priced separately.

Distribution

This function includes capital financing, operating, maintenance, and overhead costs for the Distribution System of feeders, canals, pipelines, laterals, and other appurtenant works. The Distribution System facilities are distinguished from Conveyance and Aqueduct facilities at the point of connection to the SWP, Lake Mathews (CRA), and other major turnouts along the CRA facilities. Examples include the Rialto Pipeline; the Etiwanda Pipeline; the Foothill Feeder; the Sepulveda Feeder; the Santa Monica Feeder; the Upper, Middle, and Lower Feeders; and the San Diego Pipelines No.1, No. 2, No. 3, No. 4, and No. 5.

Demand Management

A separate demand management service function has been used to clearly identify the cost of Metropolitan's incentives in local resources like conservation, recycling, and desalination.

Metropolitan increased the emphasis on Demand Management programs after the devastating drought of the early 1990's. Metropolitan's 1996 Integrated Resources Plan identified the Preferred Resource Mix as the resource plan that achieved the region's reliability goal of providing the full capability to meet all retail-level demands during foreseeable hydrologic events, represented the least-cost sustainable resources plan, met the region's water quality objectives, was balanced and diversified and minimized risks, and was flexible, allowing for adjustments should future conditions change.

The Preferred Resource Mix included locally developed water supplies and conservation, and recognized that regional participation was important to achieve their development. Additional imported supplies frequently have relatively lower development costs, but can create a large cost commitment for regional infrastructure to transport and store those imported supplies. On the other hand, local projects, like those designed to recycle water or increase groundwater production, may have higher development costs but require little or no additional infrastructure to distribute water supplies to customers. This trade-off between relatively lower-cost imported supplies requiring large regional infrastructure investments and relatively higher-cost local supply development requiring less additional local infrastructure was an important consideration in the development of the Preferred Resource Mix. A strategy of aggressively investing in imported water supply would lead to higher costs for the region because of the larger investments required in infrastructure.

Demand Management Programs decrease and avoid operating and capital maintenance and improvement costs, such as costs for repair of and construction of additional or expanded water conveyance, distribution, and storage facilities. Investments in demand side management programs like conservation, water recycling, and groundwater recovery help defer the need for additional conveyance, distribution, and storage facilities. The programs also free up capacity in Metropolitan's system to convey both Metropolitan water, and water from other non-Metropolitan sources.

Metropolitan's 1996 Integrated Resource Plan included an analysis of future demand scenarios and their effect on infrastructure requirements. A comparison of capital infrastructure costs with and without Demand Management Programs showed a difference of around $2 billion. In other words, the ability to meet demand through local Demand Management Programs resulted in an anticipated $2 billion in capital cost savings. A sensitivity analysis further showed that a 5% increase or decrease in demand had a correlative effect on when Metropolitan would need to incur capital infrastructure costs. Since then, Metropolitan has seen the benefits materialize. Metropolitan has been able to defer the need to build additional infrastructure such as the Central Pool Augmentation Project tunnel and pipeline, completion of San Diego Pipeline No. 6, the West Valley Interconnection, and the completion of the SWP East Branch expansion. Overall, the decrease in demand resulting from these projects is estimated to defer the need for projects between four and twenty-five years at a savings of approximately $2.7 billion in 2015 dollars.

Since 1996, the Integrated Resources Plan has been updated three times, in 2004, 2010, and 2015, reaffirming long-term sustainability of the region's water supply through implementation of conservation and local resource development.

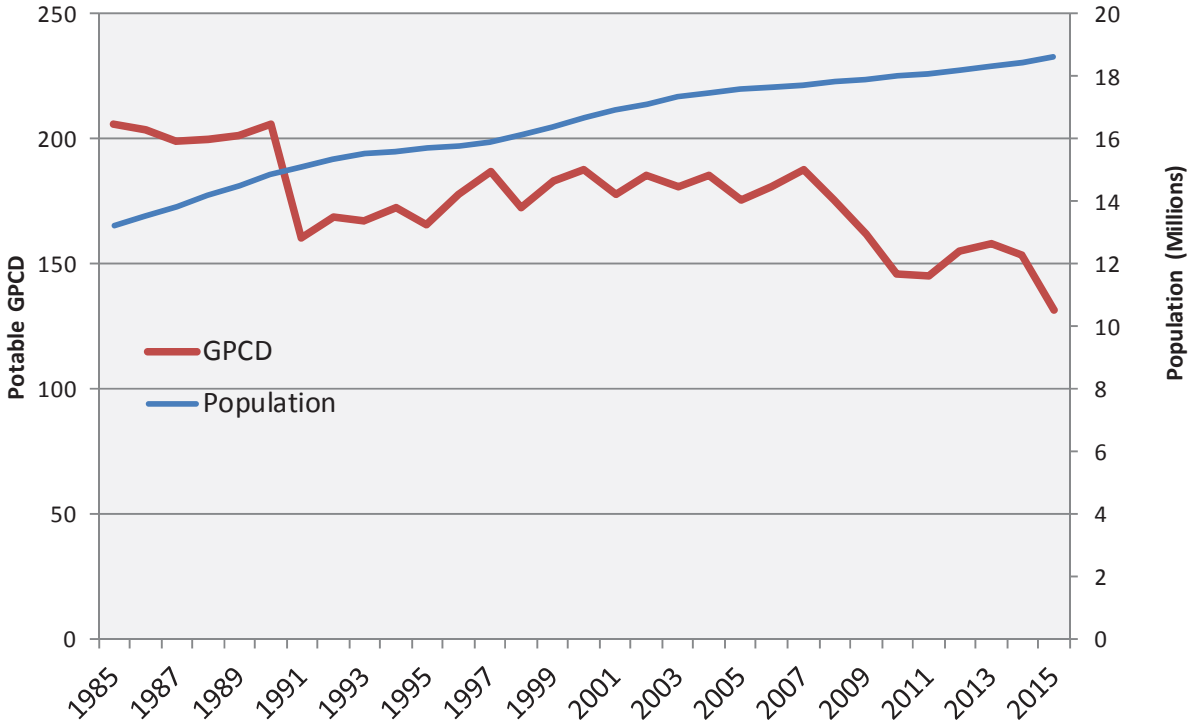
Demand management is an important part of Metropolitan's resource management efforts. Metropolitan's incentives in these areas contribute to savings for all users of the system in terms of lower capital costs that would otherwise have been required to expand and maintain the system.

Demand Management: SB-60

In September 1999, Governor Gray Davis signed SB 60 (Hayden) into law. SB 60 amended the Metropolitan Water District Act to direct Metropolitan to increase "sustainable, environmentally sound, and cost-effective water conservation, recycling, and groundwater storage and replenishment measures." SB 60 also requires Metropolitan to hold an annual public hearing to review its urban water management plan for adequacy in achieving an increased emphasis on cost-effective conservation and local water resource development, and to invite knowledgeable persons from the water conservation and sustainability fields to these hearings. Finally, Metropolitan is required to annually prepare and submit to the Legislature a report on it progress in achieving the goals of SB 60. SB 60 specifically indicated that no reimbursement was required by legislation because Metropolitan, as a local agency, has the authority to levy service charges, fees or assessments sufficient to pay for the program or level of service mandated by SB 60. No other water utility in California, public or private, has been specifically identified by the state Legislature and directed to pursue water conservation and local water resource development.

In fiscal year 2014/15 alone, Metropolitan's service area achieved 1.5 million acre-feet of water savings from conservation, recycled water and groundwater recovery programs. Figure 16 below compares population in millions on the right axis and gallons per capita daily (GPCD) water is on the left axis. While the population has increased to approximately 18.5 million, GPCD water use has decreased to approximately 125 GPCD. These reductions derived from programs for which Metropolitan paid incentives, as well as code-based conservation achieved through legislation, building and plumbing codes and ordinances, and reduced consumption resulting from changes in water pricing. Cumulatively, since 1990 Metropolitan has invested almost $1 billion and Metropolitan's service area has achieved 17.9 million acre-feet of water savings. These water savings reduce per capita water demands, allowing Metropolitan to serve a growing population with existing supplies and without constructing additional facilities for imported water.

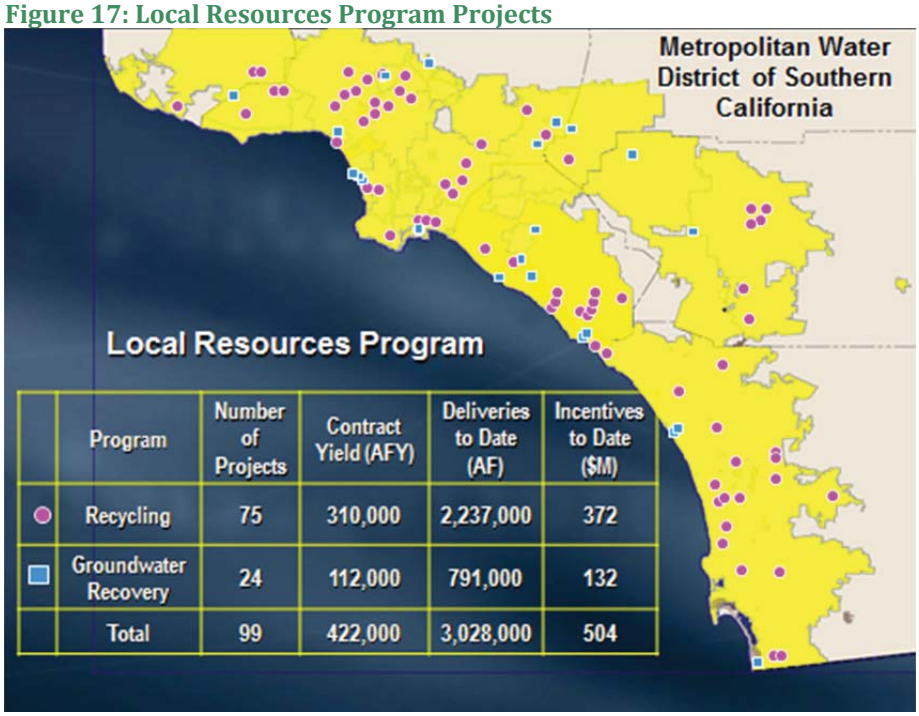
Figure 16: Population and Per Capita Daily Water Use



Metropolitan's Conservation Credits Program provides incentives to residents and businesses for use of water-efficient products and qualified water-saving activities. Rebates have been provided to residential customers for turf removal and purchasing of high-efficiency clothes washers and toilets. Rebates are also provided to businesses and institutions for water-saving devices. In fiscal year 2014/15, the Conservation Credits Program achieved 944,000 acre-feet of saved water through new and existing conservation initiatives funded with incentives and maintained through plumbing codes. Cumulatively, through fiscal year 2014/15 the Conservation Credits Program has achieved over 2.2 million acre-feet of water savings.

Metropolitan provides financial incentives through its Local Resources Program for the development and use of recycled water and recovered groundwater for the participants. The Local Resources Program consists of 75 recycling projects and 24 groundwater recovery projects located throughout Metropolitan's service area, of which 85 projects are in operation, as shown in Figure 17. From the Local Resources Program's inception in 1982 through FY 2014/15, Metropolitan has paid out about $372 million in incentives to produce about 2.2 million acre-feet of recycled water. Metropolitan also provided approximately $132 million to produce 791,000 acre-feet of recovered degraded groundwater for municipal use.

Figure 17: Local Resources Program Projects



	Program	Number of Projects	Contract Yield (AFY)	Deliveries to Date (AF)	Incentives to Date ($M)
●	Recycling	75	310,000	2,237,000	372
■	Groundwater Recovery	24	112,000	791,000	132
	Total	99	422,000	3,028,000	504

Demand Management: SB X7-7

SB X7-7 mandated a new requirement to lower urban per capita water use 20 percent by December 31, 2020. Enacted by the state Legislature and signed into law by Governor Schwarzenegger as part of a historic package of water reforms in November 2009, the "20x2020" plan gave local communities flexibility in meeting this target while accounting for previous efforts in conservation and recycling. The Legislature found that reducing water use through conservation and regional water resources management would result in protecting and restoring fish and wildlife habitats, reducing dependence on water through the Delta, and providing significant energy and environmental benefits. Metropolitan coordinates closely with its member agencies to achieve these targets both at a retail agency level in compliance with legislative requirements, and as a region in achieving a true 20 percent reduction in per-capita water use.

Metropolitan provides incentives under both the Conservation Credits Program and the Local Resources Program. The incentives developed were based on the benefits of the programs. The financial benefits of these programs to Metropolitan continue to be the reduction in capital investments due to a deferral and/or downsizing of *regional* infrastructure to import water, and the reduction in Operations and Maintenance expenditures needed to distribute, store and treat imported water. These benefits occur year-round regardless of hydrologic conditions because once a large capital project is deferred, the savings are permanent. Additional benefits of local water management programs are realized during droughts or emergencies when imported supplies are scarcer. The greatest economic benefit associated with developing local resources is the downsizing of Metropolitan's regional capital investment plan needed to deliver additional imported water to member agencies.

Projects that have been deferred or downsized due to the conservation and local resource development include the Central Pool Augmentation Project tunnel and pipeline, completion of San Diego Pipeline No. 6, the West Valley Interconnection, and the completion of the SWP East Branch expansion.

The incentives must be adequate to cause member agencies to construct local resource development. The Local Resources Program was conceived in 1982. The easiest, most cost-effective projects have already been

implemented. Future projects are more difficult to site and are more costly to develop. Member agencies have indicated that cost is the predominant constraint and that financial assistance is needed, especially in early years. In 2014, the Metropolitan Board increased the Local Resources Program incentives to account for the impact of inflation and the increase in the average unit cost of projects since the Local Resources Program was approved.

Administrative and General (A&G)

These costs occur in each of the Groups' departmental budgets and reflect overhead costs that cannot be directly functionalized. The COS process allocates A&G costs to the service functions based on the labor costs of non-A&G dollars allocated to each function.

Hydroelectric

Hydroelectric costs include the capital financing, operating, maintenance, and overhead costs incurred to operate the 16 small hydroelectric plants located throughout the water distribution system.

Functional Assignment Bases

The functional assignment bases are used to assign costs that make up the Revenue Requirement into the various service functions. The primary functional assignment bases used in the cost-of-service process are listed below.

- Direct assignment
- Net Book Value plus Work-In-Progress
- Prorating in proportion to other allocations
- Manager analysis
- Prior year results

Schedule 3 summarizes the total dollar amounts assigned, including the absolute value of Revenue Offsets (rather than showing Revenue Offsets as a reduction to costs), using each of the above types of assignment bases, for FY 2016/17 and FY 2017/18. It assigns both total Revenue Requirements before Revenue Offsets and Revenue Offsets by summing the items before assigning dollars to the primary functional assignment bases.

To ensure the correct amount has been assigned, the Revenue Requirement is restated at the bottom portion of each fiscal year chart.

Attachment 4

San Diego County Water Authority
4677 Overland Avenue • San Diego, California 92123-1233
(858) 522-6600 FAX (858) 522-6568 www.sdcwa.org

October 13, 2009

Tim Brick, Chairman
Metropolitan Water District
of Southern California
P.O. Box 54153
Los Angeles, CA 90054-0153

Re: Carlsbad Desalination Project
Item 9-2, October 13, 2009 MWD Board Meeting

Dear Chairman Brick,

After years of planning and an unprecedented level of environmental and public review by numerous public agencies and regulators, including the California Coastal Commission, the State Lands Commission and Regional Water Quality Control Board, the Carlsbad Desalination Project is fully permitted and ready to start construction within a matter of weeks. Approval by Metropolitan Water District of the Seawater Desalination Program (SDP) agreement among MWD, the San Diego County Water Authority, and nine of the Water Authority's member public agencies is the final action needed to deliver this highly reliable water supply project to Southern California. Unfortunately, based on comments and actions taken at your board's Water Planning and Stewardship Committee on Monday, it appears that the MWD Board may end up frustrating project implementation by delaying approval of the SDP agreement. MWD's failure to timely approve the SDP agreement – at the same time it is experiencing a water supply shortage allocation and statewide water crisis – would seriously undermine MWD's reputation and credibility in Sacramento and Washington at a time when it is most needed in Bay-Delta negotiations.

As part of its August 20, 2001 action approving the seawater desalination program, MWD adopted administrative guidelines including provisions for, "Agreements coordinated through sponsoring member agencies for terms up to 25 years." (Emphasis added.) The Water Authority is the member agency coordinating the Carlsbad project in direct conformance with MWD's administrative guidelines. Three months later, in November 2001, MWD issued a request for proposals for seawater desalination projects within MWD's service area; the Carlsbad project was one of five approved projects. This project helps implement MWD's 2004 Integrated Resources Plan, which included a target of developing 150,000 acre-feet of seawater desalination; the Carlsbad project alone will satisfy more than one-third of that goal.

The Carlsbad project has strong support across a broad spectrum of stakeholders, including business and civic organizations, and state and local elected officials. In fact, MWD supported the project throughout its development and permitting, providing supportive testimony before key permitting agencies, including the California State Lands Commission and the California Coastal Commission. The project will provide 56,000 acre-feet of reliable water annually within the MWD service territory at a time when we most need it. The project completion date is scheduled for 2012, long before MWD can reasonably expect to find or implement any alternative that could provide such a large and reliable water supply. Moreover, under MWD's Supply Allocation Plan, the Water Authority's water supply allocation from MWD would be reduced as a result of the implementation of this project. This means more water for all of MWD's other member agencies. Progress on the project was recently reported to MWD's newly created Special Committee on Desalination and Recycling; there was no suggestion at that time that MWD needed more time to study the project. Indeed, the premise of that meeting was an expressed concern that MWD's current program supporting seawater desalination projects might have to be changed because member agency projects were not being implemented in a timely fashion.

The SDP agreement has been extensively and successfully negotiated among the parties. Under the agreement, the Water Authority has agreed to perform all obligations MWD has required, including commitments to ensure that the public interest is protected under the public/private partnership with Poseidon. Drafted by MWD's own legal counsel, the SDP agreement ensures that the public interest is protected through provisions that ensure public funds are properly expended and accounted for, that payments are made only for water that is actually delivered, and that project costs are minimized. These are the exact concerns the Water Authority and its member agencies have and which have been addressed in the SDP agreement. As MWD's largest member agency, the Water Authority has a strong and vested interest in assuring that MWD dollars are wisely spent.

During yesterday's Water Planning and Stewardship Committee, several board members questioned the SDP agreement, as though this agreement presented novel terms. But, the agreement is no different than many other agreements MWD has approved for local projects of other member agencies, including three of the other four seawater desalination projects approved as part of MWD's RFP process. MWD's up to $250/af contribution is paid only if water is actually produced, and is used solely to offset legitimate project costs as specified and verified by MWD. With the structure of this agreement, MWD bears no risks associated with project permitting and development.

MWD has reviewed this project numerous times during its development over the past several years and the project proponents, including the Water Authority and its

member agencies, have relied upon MWD's past review, comments, encouragement and strong support before regulatory and permitting agencies. The SDP agreement for MWD funding has been a specified project element that MWD has also known about and encouraged for many years. The Water Authority and its member agencies pursued the project in the good faith expectation that MWD would evaluate the project on an equal basis with other LRP projects under existing programs, consistent with SDP agreements signed with other agencies, and within the timeframe identified for successful project implementation. The last minute questions now being raised by MWD board members and the proposed referral to a new committee for yet another round of review cannot be justified based on the merits of this project, will likely jeopardize favorable financing for the project and could place the project itself at risk. There is no legitimate reason for MWD to erect a new roadblock to water supply reliability for its own customers.

The MWD board authorized entering into the SDP agreement in 2005 with all five member agencies, including the Water Authority, responding to the RFP. Since that time, MWD has executed three other SDP agreements. In the case of this agreement, each and every concern raised by MWD staff and legal counsel has been addressed by the Water Authority, its participating member public agencies, and Poseidon. The Water Authority urges the MWD board to approve the SDP agreement in November so that this important regional water supply project can proceed.

Sincerely,

Claude A. Lewis

Claude A. "Bud" Lewis
Chair
Board of Directors

CC: San Diego County Water Authority Board of Directors
Poseidon Resources, LLC
San Diego County Legislative Delegation
Governor Arnold Schwarzenegger
Senate Natural Resources and Water Committee Chair Fran Pavley
Assembly Water, Parks and Wildlife Committee Chair Jared Huffman

Attachment 5

Carollo Engineers
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Tel: 858.505.1020
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carollo.com

COST OF SERVICE STUDY

MAY 2015

San Diego County Water Authority

Calendar Year 2016 Rates and Charges

cost has been allocated to the storage rate component and will be recovered through the CY 2016 rates. The CY 2016 cost represents an increase from CY 2015 due to greater expected storage and evaporation levels.

Local Water Supply Development: This is the cost to implement local water supply projects within the Water Authority's service area in order to provide a long-term reliable and sustainable supply. The cost is recovered through the Customer Service charge to recognize the general region benefit. A total of $4.03 million will be recovered through the CY 2016 rates.

Twin Oaks Reimbursement: This reimbursement reflects a 25-year payback to customer service for the upfront investment in the implementation of the Twin Oaks Valley Water Treatment Plant. This original investment was funded through use of Pay-as-you-Go (PAYGO) funds, which had been historically collected from the non-treatment functional rate categories. The cost is recovered through the treatment charge. A total of $0.77 million will be recovered through the CY 2016 rates.

3.3 CAPITAL COSTS

The Water Authority's existing CIP is based on the results of planning studies, including the 2010 Urban Water Management Plan (UWMP) and the 2002 Regional Water Facilities Master Plan and extends through 2030. These CIP projects include a mix of new facilities that will add capacity to existing conveyance, storage, and treatment facilities, as well as repair and replace aging infrastructure. The Water Authority utilizes both PAYGO and debt financing to fund capital improvements.

3.3.1 Annual Debt Service

The Water Authority finances major capital improvements, in part, by issuing debt for two primary reasons. First, given the size of recent capital projects, the Water Authority does not have the financial reserves available that would otherwise be required to fund the CIP nor would it be reasonable to increase the water rates and charges in order to cash fund these improvements. Secondly, spreading the debt service costs for the project over the repayment period provides intergenerational equity by effectively spreading the financial burden between both existing and future users of the system. This approach allows the Water Authority to better match the cost of improvements with those benefitting from the improvements. This methodology is internally consistent with the development of the Water Authority's System and Treatment Capacity Charges.

Finally, as an auxiliary benefit to the use of debt, the cash generated from meeting the Water Authority's coverage requirements provides additional cash that can be used to fund PAYGO projects.

6 FINDINGS

Based on the independent review performed for this rate study, Carollo confirms the Water Authority's existing methodology, cost allocations, rate-setting principles, and proposed CY 2016 rates are reasonable and consistent with AWWA cost-of-service principles, Board policies, and California legal requirements. Carollo's finding for this study are as follows:

- The Water Authority has significant detail and a sound basis for existing and proposed water rates and charges.
- The resulting cost of service allocations and existing methodology provide a clear, reasonable, and provide a defensible nexus between the cost of service provided and rates charged.
- Board policies and cost-of-service guidelines are applied consistently with industry best practices and AWWA M1 standards.
- The Water Authority's rates and charges adhere to the legal requirements as described within this report.
- The IAC was calculated in compliance with Board policies and adheres to the legal requirements as described within this report.
- The existing methodology yields an appropriate and reasonable method for allocating costs, which could be sustained absent substantial changes in cost drivers or customer discharge patterns occur.
- Revenue adjustments are necessary to cover the Water Authority's budget requirements. The revenue requirements for CY 2016 are coverage driven, as existing revenues fall below the desired DSCR target of 1.50x and necessary deposits into the RSF.
- The proposed CY 2016 water rates and charges necessitate roughly an $8 million utilization of the RSF and continue to meet the Board's DSCR target of 1.50x.

Attachment 6, Part 1

United States Environmental Protection Agency

Cases in Water Conservation:

How Efficiency Programs Help Water Utilities Save Water and Avoid Costs

New York City Department of Environmental Protection

www.nyc.gov/dep

City of Ashland

Tampa Water Department

Water Resources Authority Massachusetts

Irvine Ranch Water District

Reduce Your Use

Town of Gilbert water conservation

City of Santa Monica

What Will You Save Today?

Water Conservation Program City of Houston

A Message from the Administrator

Christine Todd Whitman

I believe water is the biggest environmental issue we face in the 21st Century in terms of both quality and quantity. In the 30 years since its passage, the Clean Water Act has dramatically increased the number of waterways that are once again safe for fishing and swimming. Despite this great progress in reducing water pollution, many of the nation's waters still do not meet water quality goals. I challenge you to join with me to finish the business of restoring and protecting our nation's waters for present and future generations.

Table of Contents

Introduction

Water utilities across the United States and elsewhere in North America are saving substantial amounts of water through strategic water-efficiency programs. These savings often translate into capital and operating savings, which allow systems to defer or avoid significant expenditures for water supply facilities and wastewater facilities.

These case studies feature the efforts and achievements of 17 water systems. These systems range in size from small to very large, and their efficiency programs incorporate a wide range of techniques for achieving various water management goals. In every case, the results are impressive. The following summary table provides an overview of the case studies, highlighting problems addressed, approaches taken, and results achieved. In general, water conservation programs also produce many environmental benefits, including reduced energy use, reduced wastewater discharges, and protection of aquatic habitats.

The incidence of water conservation and water reuse programs has increased dramatically in the last 10 years. Once associated only with the arid West, these programs have spread geographically to almost all parts of the United States. In many cities, the scope of water conservation programs has expanded to include not only residential customers, but commercial, institutional, and industrial customers, as well. These case studies illustrate some of the tangible results achieved by water conservation programs implemented at the local level. Many of these accomplishments have broader relevance to other communities facing similar water resource management and infrastructure investment issues.

EPA used secondary data sources to compile these case studies. These sources are cited in the "Resources" section at the end of each piece. In addition, contacts for each water system have reviewed and approved their case study. Because the case studies come from secondary sources, the type of information provided is not necessarily uniform or comparable, and is not intended to provide generalized results. The terms water conservation and water efficiency are used here in their broadest context, which includes water loss management, wastewater reclamation and reuse for non-potable purposes, adoption of conservation water rates, changes to more efficient water-using equipment, and behavioral changes that reduce water use.

Summary of Conservation Case Studies

City	Problem	Approach	Results
Albuquerque, New Mexico	A dry climate and increased population growth put a strain on Albuquerque's water supply.	Albuquerque's Long-Range Water Conservation Strategy Resolution consisted of new conservation-based water rates, a public education program, a high-efficiency plumbing program, landscaping programs, and large-use programs.	Albuquerque's conservation program has successfully slowed the groundwater drawdown so that the level of water demand should stay constant until 2005. Peak demand is down 14% from 1990.
Ashland, Oregon	Accelerated population growth in the 1980s and the expiration of a critical water right created a water supply problem.	Ashland's 1991 water efficiency program consisted of four major components: system leak detection and repair, conservation-based water rates, a showerhead replacement program, and toilet retrofits and replacement.	Ashland's conservation efforts have resulted in water savings of approximately 395,000 gallons per day (16% of winter usage) as well as a reduction in wastewater volume.
Cary, North Carolina	With the population more than doubling during the past 10 years and high water demand during dry, hot summers, the city's water resources were seriously strained.	Cary's water conservation program consists of eight elements: public education, landscape and irrigation codes, toilet flapper rebates, residential audits, conservation rate structure, new homes points program, landscape water budget, and a water reclamation facility.	Cary's water conservation program will reduce retail water production by an estimated 4.6 mgd by the end of 2028, a savings of approximately 16% in retail water production. These savings reduced operating costs and have already allowed Cary to delay two water plant expansions.
Gallitzin, Pennsylvania	By the mid-1990s, the town of Gallitzin was experiencing high water loss, recurring leaks, low pressure, high operational costs, and unstable water entering the system.	Gallitzin developed an accurate meter reading and system map, and a leak detection and repair program.	The results of the program were dramatic. Gallitzin realized an 87% drop in unaccounted-for water, a 59% drop in production, and considerable financial savings.
Gilbert, Arizona	Rapid population growth during the 1980s put a strain on the water supply of this Arizona town located in an arid climate.	Gilbert instituted a multi-faceted water conservation program that included building code requirements, an increasing-block water rate structure, a metering program, public education, and a low water-use landscaping program.	Gilbert has been particularly successful reusing reclaimed water. A new wastewater reclamation plant was built, as well as several recharge ponds that serve as a riparian habitat for a diverse number of species.

Summary of Conservation Case Studies

City	Problem	Approach	Results
Goleta, California	A growing California town, Goleta was facing the possibility of future water shortages. Its primary water source, Lake Cachuma, was not sufficient to meet its needs.	Goleta established a water efficiency program that emphasized plumbing retrofits, including high-efficiency toilets, high-efficiency showerheads, and increased rates.	The program was highly successful, resulting in a 30% drop in district water use. Goleta was able to delay a wastewater treatment plant expansion.
Houston, Texas	Houston's groundwater sources have experienced increasing problems with land subsidence, saltwater intrusion, and flooding. These problems, along with a state regulation to reduce groundwater use, led Houston to explore methods for managing groundwater supplies.	Houston implemented a comprehensive conservation program that included an education program, plumbing retrofits, audits, leak detection and repair, an increasing-block rate structure, and conservation planning.	The dramatic success of pilot programs has led Houston to predict a 7.3% reduction in water demand by 2006 and savings of more than $260 million.
Irvine Ranch Water District, California	IRWD has experienced dramatic population growth, drought conditions in the late 80s and early 90s, and increasing wholesale water charges.	IRWD's primary conservation strategy was a new rate structure instituted in 1991. The five-tiered rate structure rewards water-efficiency and identifies when water is being wasted. The goal is to create a long-term water efficiency ethic, while maintaining stable utility revenues.	After the first year of the new rate structure, water use declined by 19%. Between 1991 and 1997, the district saved an estimated $33.2 million in avoided water purchases.
Massachusetts Water Resources Authority	MWRA is a wholesale water provider for 2.2 million people. From 1969 to 1988, MWRA withdrawals exceeded the safe level of 300 mgd by more than 10% annually.	MWRA began a water conservation program in 1986 that included leak detection and repair, plumbing retrofits, a water management program, an education program, and meter improvements.	Conservation efforts reduced average daily water demand from 336 mgd (1987) to 256 mgd (1997). This allowed MWRA to defer a water-supply expansion project and reduce the capacity of the treatment plant, resulting in total savings ranging from $1.39 million per mgd to $1.91 million per mgd.
Metropolitan Water District of Southern California	Metropolitan Water District is the largest supplier of water for municipal purposes in the United States. Metropolitan recognized the need for conservation, given increased economic and population growth, drought, government regulations, water quality concerns, and planned improvement programs.	Metropolitan's Conservation Credits Program provides funding for a large percentage of water conservation projects. Projects have included plumbing fixture replacement, water-efficiency surveys, irrigation improvements, training programs, and conservation-related research projects.	Conservation efforts have considerably reduced the cost estimate of Metropolitan's capital-improvement. Water savings have amounted to approximately 66,000 acre-feet per year, a savings of 59 mgd.

Summary of Conservation Case Studies

City	Problem	Approach	Results
New York City, New York	By the early 1990s, increased demand and periods of drought resulted in water-supply facilities repeatedly exceeding safe yields. Water rates more than doubled between 1985 and 1993.	New York's conservation initiatives included education, metering, leak detection, water use regulation, and a comprehensive toilet replacement program.	Leak detection and repair, metering, and toilet replacements were particularly successful programs. New York reduced its per-capita water use from 195 gallons per day in 1991 to 167 gallons per day in 1998, and produced savings of 20 to 40% on water and wastewater bills.
Phoenix, Arizona	Phoenix is one of the fastest growing communities in the United States and suffers from low rainfall amounts. The state legislature has required that, after 2025, Phoenix and suburban communities must not pump groundwater faster than it can be replenished.	Water conservation programs instituted in 1986 and 1998 focused on pricing reform, residential and industrial/ commercial conservation, landscaping, education, technical assistance, regulations, planning and research, and interagency coordination.	Phoenix's conservation program currently saves approximately 40 mgd. Phoenix estimates that the conservation rate structure alone saved 9 mgd.
Santa Monica, California	Santa Monica faced rapid population growth, which put a strain on its water supplies. Also, contamination was found in several wells in 1996, forcing the city to increase water purchases.	Santa Monica instituted a multifaceted water conservation program that includes water-use surveys, education, landscaping measures, toilet retrofits, and a loan program.	Santa Monica was able to reduce its water use by 14% and waste-water flow by 21%. The toilet retrofit program resulted in a reduction of 1.9 mgd and net savings of $9.5 million from 1990 to 1995.
Seattle, Washington	Steady population growth, dry summers, and lack of long-term storage capacity forced Seattle to choose between reducing use and developing new water sources.	Seattle's water conservation program has included a seasonal rate structure, plumbing fixture codes, leak reduction, incentives for water-saving products, and public education. Special emphasis has been placed on commercial water conservation.	Per-capita water consumption dropped by 20% in the 1990s. The seasonal rate structure, plumbing codes, and efficiency improvements are particularly credited with success. It is estimated that the commercial water conservation programs will save approximately 8 mgd.
Tampa, Florida	Rapid economic and residential population growth along with seasonal population growth has put a strain on Tampa's water supply.	Since 1989, Tampa's water conservation program has included high efficiency plumbing retrofits, an increasing-block rate structure, irrigation restrictions, landscaping measures, and public education. Particular emphasis has been put on efficient landscaping and irrigation.	Tampa's landscape evaluation program resulted in a 25% drop in water use. A pilot retrofit program achieved a 15% reduction in water use.

Summary of Conservation Case Studies

City	Problem	Approach	Results
Wichita, Kansas	Ten years ago, analysts determined that the city's available water resources would not meet its needs beyond the first decade of the 21st century. Alternative sources were not available at an affordable price.	Wichita utilized an integrated resource planning approach. This included implementing water conservation, evaluating existing water sources, evaluating nonconventional water resources, optimizing all available water resources, pursuing an application for a conjunctive water resource use permit, evaluating the effects of using different water resources, and communicating with key stakeholders.	Analysis of resource options for Wichita resulted in a matrix of 27 conventional and nonconventional resource options.
Barrie, Ontario	Rapid population growth put a strain on Barrie's water and wastewater infrastructure, forcing the city to consider expensive new supply options and infrastructure development.	Barrie's conservation plan focused on replacing inefficient showerheads and toilets.	Barrie was able to save an average of 55 liters (14.5 gallons) per person per day. The reduction in wastewater flows enabled Barrie to defer an expensive capital expansion project. Water conservation efforts saved an estimated $17.1 million (Canadian dollars) in net deferred capital expenditures.

mgd = million gallons per day

Albuquerque, New Mexico: Long-Range Planning to Address Demand Growth

Background

Albuquerque's water system produces approximately 37 billion gallons per year and serves a population of approximately 483,000. The city receives less than 9 inches of rain per year, and its water supply was strained severely when its population grew by 24 percent between 1980 and 1994.

In 1993, the United States Geological Survey reported that groundwater levels in Albuquerque were dropping significantly. The rate of groundwater withdrawals by the city was more than twice the amount that could be sustained over time. The city planned to use surface water diverted from the Colorado River Basin to the Rio Grande River Basin to recharge its falling groundwater supplies, but studies of the area showed that the plan was not feasible. In 1994, Albuquerque instead adopted a comprehensive Water Resources Management Strategy, which included plans to make more direct use of surface water supplies, reclaim wastewater and shallow groundwater for irrigation and other nonpotable uses, and implement an aggressive water conservation program.

Approach

Albuquerque adopted the Long-Range Water Conservation Strategy Resolution, which states that "conservation can extend the city's supply at a fraction of the cost of other alternatives." The resolution's goal is to reduce total water usage by 30 percent by 2004, a decrease of 75 gallons per capita per day over 9 years. The water conservation program includes five components:

- **Water Rates.** The city applies a summer surcharge of 21 cents per ccf (100 cubic feet) when customers' use exceeds 200 percent of their winter average. In 1995, the city increased the rate by 8.8 cents per ccf of water consumed to fund the water conservation program. More than half of the revenue from the surcharge is allocated to the conservation program, and a large portion is returned to customers through rebates and other incentives. On May 1, 2001, the commodity rate increased to $1.07 per ccf ($1.43 per 1,000 gallons) including an additional state surcharge of 2.44 cents per ccf.
- **Public Education.** Education programs consist of running public relations campaigns, including water usage information in water bills, and organizing cooperative programs

with schools and community organizations. The city works with citizens and affected customers whenever new legislation or measures are developed or proposed.

- **Residential Use.** Albuquerque amended its Uniform Plumbing Code to require high-efficiency toilets (1.6 gallons or less per flush) in all new residential construction. The city also established rebates for high-efficiency toilets (up to $100) and efficient clothes washers ($100). The city offers free water audits and installation of high-efficiency plumbing devices.
- **Landscaping/Outdoor Water Use.** In 1995, the city adopted the Water Conservation Landscaping and Water Waste Ordinance. The ordinance includes strict requirements for landscaping new developments, such as prohibiting the use of high-water-use grasses on more than 20 percent of the landscaped area. It also includes restrictions for landscaping on city properties, along with watering and irrigation regulations. Since 1996, the city has offered tools to assist property owners in converting to Xeriscape™ landscapes. In addition to how-to videos and guides, homeowners can choose from six professionally designed Xeriscape™ plans. The Xeriscape™ Incentive Program provides a rebate of 25 cents per square foot of converted landscape area up to $500 ($700 for commercial landscapes).
- **Institutional, Commercial, and Industrial Water Use.** The city requires all customers using more than 50,000 gallons per day to prepare and implement a water conservation plan. The city plans to adopt an ordinance to prohibit once-through cooling systems. The city currently runs a program to reduce water losses it can't account for and makes free water-use surveys available for non-residential customers.

Results

Albuquerque's water conservation program has successfully slowed the drawdown of the area's groundwater supply. Estimates indicate that the water conservation programs will decrease the level of water demand in Albuquerque until 2005. Water savings from conservation will help mitigate the rate of future demand growth.

Specific conservation programs have met with considerable success. By the end of April 2001, rebates had been provided for more than 39,000 high-efficiency toilets. At the close of the year, per capita water use had dropped to 205 gallons per day—a reduction of 45 gallons per day from 1995 levels. Albuquerque found that, by 2001, its landscaping program and rate structure had helped reduce peak water use by 14 percent from its high point in 1990.

Summary of Results for Albuquerque, NM

Number of high-efficiency toilets installed (by 2001)	39,303
Reduction in per-capita water use (from 1995 to 2001)	45 g/c/d
Reduction in peak demand (1990 – 2001)	14%

g/c/d = gallons per capita per day

Resources

City of Albuquerque, Water Conservation Programs 1998, <www.cabq.gov/waterconservation/index.html>

Edward R. Osann and John E. Young, *Saving Water, Saving Dollars: Efficient Plumbing Products and the Protection of America's Waters* (Potomac Resources, Inc., Washington, DC, April 1998), p. 39.

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Ashland, Oregon: Small Town, Big Savings

Background

Ashland, Oregon, is a small city of approximately 20,000 people. The Water Division treats and transports an average of 6.5 million gallons daily in the summer and 2.5 million gallons daily in the winter. Annual usage is approximately 150 gallons per capita per day. Ashland experienced an accelerated population growth rate in the late 1980s. At the same time, it faced the imminent expiration of a critical water right. Initially, the city had two options available to increase water supplies. The first was to create a reservoir by damming Ashland Creek at a cost of approximately $11 million. The second was to lay 13 miles of pipeline to the Rogue River at a cost of approximately $7.7 million. The city decided, however, that neither option was fiscally or politically feasible. Furthermore, the proposed dam site disturbed habitat for the endangered spotted owl. Ashland therefore decided to implement a four-point water efficiency program to address its water supply problem.

Approach

Ashland's water conservation program became a natural addition to the city's existing resource conservation strategy, which addresses energy efficiency, regional air quality, recycling, composting, and land use. In 1991, the city council adopted a water efficiency program with four major components: system leak detection and repair, conservation-based water rates, a high-efficiency showerhead replacement program, and toilet retrofits and replacement. The city estimated that these programs would save 500,000 gallons of water per day at a cost of $825,875—approximately one-twelfth the cost of the proposed dam—and would delay the need for additional water-supply sources until 2021.

Implementation of the program began with a series of customer water audits, which in turn led to high-efficiency showerhead and toilet replacements and a $75 rebate program (later reduced to $60). Ashland also instituted an inverted block rate structure to encourage water conservation. Recently, Ashland began offering rebates for efficient clothes washers and dishwashers (including an energy rebate for customers with electric water heaters). The town provides a free review of irrigation and landscaping, as well.

Results

Implementation of Ashland's Water Conservation Program began in July 1992. By 2001, almost 1,900 residences had received a water audit. Almost 85 percent of the audited homes

participated in the showerhead and/or toilet replacement programs. Ashland has been able to reduce its water demand by 395,000 gallons per day (16 percent of winter use) and its wastewater flow by 159,000 gallons per day. An additional benefit of the program has been an estimated annual savings of 514,000 kilowatt-hours of electricity, primarily due to the use of efficient showerheads.

Summary of Results for Ashland, OR

Water Savings	
Water Savings per day (by 2001)	395,000 gal.
Reduction in winter usage	16%
Wastewater reduction per year (by 2001)	58 million gal.
Cost Savings	
Estimated cost of proposed reservoir program	$11,000,000
Estimated cost of proposed pipeline program	$7,700,000
Cost of water conservation program	$825,875
Total estimated avoided costs	$6,874,125 – $10,174,125

Resources

"A Negadam Runs Through It," *Rocky Mountain Institute Newsletter.* Vol. XI, No. 1 (Spring 1995), p. 8.

"The City of Ashland Municipal Utility Comprehensive Conservation Programs," The Results Center. Profile #115 <www.crest.org >.

The City of Ashland, Oregon, Conservation Department, <www.ashland.or.us/SectionIndex.asp?SectionID=432>.

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Cary, North Carolina: Cost-Effective Conservation

Background

The population of Cary, North Carolina—an affluent suburb just west of Raleigh—has more than doubled during the past 10 years, putting a strain on the city's water resources. In 1995, Cary officials began planning to expand the city's water plant to meet increased demand. Two additional expansions were scheduled to occur within a 30-year time period. Cary's water supplies are particularly strained during its dry, hot summers, mostly because of irrigation and lawn watering. Most water use in Cary (approximately 75 percent) can be attributed to residential customers, and commercial customers account for almost 21 percent of total usage. Analysts predict that the average daily retail water demand in Cary will grow from 8.6 million gallons per day (mgd) in 1998 to 26.7 mgd in 2028.

Approach

Recognizing the need to incorporate conservation into its integrated resource management, the Cary town council adopted a water conservation program in 1996 with the following goals:

- Reduce the town's average per capita water use by 20 percent by 2014 (later revised to 2020).
- Support the high quality of life in Cary by providing safe, reliable water service, while reducing per capita use of water.
- Conserve a limited natural resource.
- Reduce costs of infrastructure expansion.

In 1999, Cary decided to have its conservation programs place a greater emphasis on measures that could reduce peak-day demand during the high-volume summer months. The resulting 10-year Water Conservation and Peak Demand Management Plan is based on a careful benefit/cost analysis of numerous potential conservation programs. According to the plan, any conservation measures undertaken by the city must meet certain criteria:

- A benefit/cost ratio greater than 1.0
- Reasonable cost
- Significant water savings
- Nonquantifiable but positive effects (community acceptance)

Cary's water conservation program consists of eight elements:

Public Education. Cary runs several public education programs. The "Beat the Peak" campaign is aimed at the high-demand summer months. Through this program, residents are encouraged to gauge their sprinkler use. Another program, called "Block Leader," is a grassroots effort to involve residents in water conservation. Cary also runs an elementary school program to distribute educational materials in schools, offers workshops to teach water-efficient landscaping and gardening, and distributes printed material on water conservation to the general public.

Landscape and Irrigation Codes. The city implements water-use-restriction ordinances limiting outdoor watering during summer peak months. The Controlling Wasteful Uses of Water Ordinance allows the city to regulate and control irrigation and reduce hardscape watering and runoff. Commercial landscaping regulations require drought-tolerant plants and other water-efficient landscaping methods.

Toilet Flapper Rebates. Customers receive rebates to replace existing flappers with early closure flappers that can save up to 1.3 gallons per flush.

Residential Audits. Residential customers are offered a 1-hour audit to assess water use, detect leaks, and provide supplies such as low-flow plumbing devices.

Conservation Rate Structure. Cary has established an increasing-block rate structure to encourage water conservation. The rate structure consists of three tiers—a low-use, average-use, and high-use.

New Homes Points Program. The city approves development projects based on a point scale, giving extra points for subdivisions that use selected water-efficient measures.

Landscape Water Budget. Large public and private irrigation users are provided monthly water budgets that identify the appropriate watering needs for their situation.

Water Reclamation Facility. The city is building a water reclamation facility that will produce up to 1.58 million gallons of reclaimed water per day. The water will be used for irrigation and other nonpotable uses. Reclaimed water will be offered free of charge to bulk-purchase customers.

Results

According to estimates, water conservation in Cary will reduce retail water production by 4.6 mgd (16 percent) by the end of 2028. Water conservation efforts will also help Cary reduce operating costs and defer considerable capital expenditures. The city has delayed the two water plant expansions, projecting that the 10-year savings from water conservation will be 1 mgd and 2 mgd by 2019.

Cary's water reclamation facility is expected to cut peak demand in the city by 8 percent. City ordinances restricting water use considerably decreased usage during peak demand months. In addition, 80 percent of residential customers and 99.9 percent of commercial customers comply with the rain sensor ordinance. City residents have redeemed approximately 500 rebates and have purchased more than 1,000 flappers. The city also distributed 25,000

packets to residents to gauge amounts of irrigation, reached 19 percent of the city's customers through Block Leaders, and mailed water conservation brochures to all customers.

Summary of Results for Cary, NC

Program Element	Water savings projected in 2009 (mgd)	Water savings projected in 2019 (mgd)	Unit cost of water saved ($/mgd)	First 5 years of costs ($)	Benefit/cost ratio
Residential water audits	0.053	0.077	546.85	71,335	1.13
Public education	0.3	0.41	400.59	314,280	1.53
Toilet flapper rebate	0.005	0	828.04	11,762	1.03
Water reclamation facility	0.27	0.3	NA	NA	NA
Landscape water budgets	0.013	0.023	754.33	64,175	0.88
New home points program	0.5	0.77	38.18	100,000	16.20
Landscape/irrigation codes	0.02	0.04	276.07	128,350	2.60
Inverted-block rate structure	0.14	0.42	49.40	54,000	14.26
Combined results	1.17	2.0	137.50	655,552	4.44

Source: Raftelis Environmental Consulting as reported in Jennifer L. Platt and Marie Cefalo Delforge, "The Cost-Effectiveness of Water Conservation," *American Water Works Association Journal.* Vol. 93, No. 3 (March 2001), p. 78.

Note: Water savings estimated for the water conservation plan do not equal the total water savings associated with the sum of each plan element because of the "shared water savings" produced by conservation measures that focus on similar end uses. The decision to construct a water reclamation facility was made independent of this study.

Resources

"Cary's Bulk Reclaimed Water Project," Town of Cary <www.townofcary.org/depts/pio/bwindex.htm>.

Platt, Jennifer L. and Delforge, Marie Cefalo. "The Cost-Effectiveness of Water Conservation," *American Water Works Association Journal*. Vol. 93, No. 3 (March 2001), pp. 73-83.

"Town of Cary Water Conservation," Town of Cary Public Works and Utilities <www.townofcary.org/depts/pwdept/water/waterconservation/overview.htm>.

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Gallitzin, Pennsylvania: Leak Management by a Small System

Background

Gallitzin is a small town in western Pennsylvania with a population of approximately 2,000. The Gallitzin Water Authority services approximately 1,000 connections. In the mid-1990s, the system was experiencing water losses exceeding 70 percent. In November 1994, the system was using an average of 309,929 gallons per day. Gallitzin experienced a peak usage in February 1995 of 500,000 gallons per day. The water authority identified five major problems in the system:

- High water loss
- Recurring leaks
- High overall operational costs
- Low pressure complaints
- Unstable water entering the distribution system

Based on these issues, the authority decided it needed a comprehensive program for water leak detection and corrosion control.

Approach

Gallitzin first developed accurate water production and distribution records using 7-day meter readings at the plant and pump station. It then created a system map to locate leakage. Through the use of a leak detector, the authority found approximately 95 percent of its leaks. Outside contractors identified the remaining 5 percent. The city initiated a leak repair program and a corrosion control program at the Water Treatment Plant. Gallitzin was one of the first systems to receive technical assistance from the Pennsylvania Department of Environmental Protection Small Water Systems Outreach Program. The training helped the authority repair distribution system leaks, replace meters, and improve customer billing. Gallitzin is also working to improve the capacity of surface-water sources and develop a supplemental groundwater source.

Results

By November 1998, 4 years after implementation of the program, the system delivered an average of 127,893 gallons per day to the town—down from 309,929 gallons per day in November 1994. Unaccounted-for water dropped to only 9 percent. The financial savings from the program have been highly beneficial. The city saved $5,000 on total annual chemical costs and $20,000 on total annual power costs from 1994 to 1998. The significant savings help the authority keep water rates down.

Other beneficial impacts reported by the Gallitzin Water Authority include:

- Extended life expectancy of equipment
- Savings in purchased water costs during drought conditions
- Reduction in overtime costs
- Improvement in customer satisfaction
- Enhanced time utilization

Summary of Results for Gallitzin, PA

	Unit	1994	1998	Percentage change
Customers	Connections (approximate)	1,000	1,000	0%
Water	Production gallons per day	309,929	127,893	-59%
	Annual production gallons	113,124,085	46,680,945	-59%
	Water pumped from low to high tank	99,549,195 (88%)	35,010,708 (75%)	-65%
	Total plant production hours	5,387	2,223	-59%
	Filter backwash water (gallons)	1,316,788	543,376	-59%
	Unaccounted-for water	70%	9%	-87%
Power	Kilowatt-hours	142,807	50,221	-65%
	Total power cost @ $.081/kwh	$31,671	12,367	-61%
Chemicals	Cost per million gallons ($) *	$90.98	$116.86	28%
	Total chemical cost ($)	$10,292	$5,455	-47%

Source: John Brutz, "Leak Detection Helps District Cut Losses," A presentation at the Energy Efficiency Forum in San Diego, California (August 1999).

* Added sodium bicarbonate treatment; other unit chemical costs remained constant or declined.

Resources

John Brutz, "Leak Detection Helps District Cut Losses," A presentation at the Energy Efficiency Forum in San Diego, California (August 1999).

"First Small Water System Outreach Effort A Success," July 12, 1996. Pennsylvania Department of Environmental Protection press release, <www.dep.state.pa.us/dep/counties/common/outreach.htm>.

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Gilbert, Arizona: Preserving Riparian Habitat

Background

The town of Gilbert, Arizona, has experienced rapid population growth, increasing from 5,717 residents in 1980 to 29,188 residents in 1990, with an estimated 2001 population of 115,000. This rapid growth has strained water resources, particularly because Gilbert is located in a very arid region, receiving an annual average rainfall of 7.66 inches and losing substantial amounts of water annually to evaporation. Prior to March 1997, Gilbert was entirely dependent upon groundwater. The town now relies on a combination of water supplies, with a capacity of 27 million gallons per day (mgd) from groundwater and 15 mgd from surface water. Surface water capacities will be expanded to 40 mgd by the summer of 2002 following the addition of a new water treatment plant. Gilbert's average water demand is 28.5 mgd, with a peak demand of 41.5 mgd. Gilbert opted to implement a comprehensive water efficiency program to help meet increased water demand, and is recognized as the first community in Arizona to design and implement a 100-year water plan. A key component of the plan is wastewater reclamation and recharge of groundwater. The reuse project has created wildlife habitat and the recharge areas are used for recreation, education, and research.

Approach

Gilbert has implemented a multifaceted approach to water conservation. First, building code requirements exist for all new construction and include requirements for efficient plumbing devices and the use of recycled water. Next, an increasing-block water rate structure was instituted, consisting of the following:

Monthly Consumption (Gallons)	Cost per 1,000 gallons
0 to 20,000	$0.85
20,000 to 30,000	1.10
30,000+	1.25

All water use in Gilbert—residential, commercial, and industrial—is metered, and Gilbert set a goal of 100 percent reuse of reclaimed water. The town also sponsors several public-education programs and requires using pre-approved low water-use plant materials for all landscaping in street right-of-way. Gilbert also is developing additional conservation measures, such as water-use audits, free conservation kits, Xeriscape™ brochures and other outdoor water saving information; a homeowners water conservation education program; and a new school education program.

Results

Gilbert's conservation efforts are considered a success, particularly its efforts to reuse and recharge all its reclaimed water. Gilbert receives credits from the state where the effects of recharge are measurable. Water reclamation has helped the city meet groundwater management goals and has provided an additional resource for meeting water demand. In 1986, Gilbert built a 5.5 mgd wastewater reclamation plant, allowing the city to store recharge water for future use. In 1989, the town developed a 40-acre recharge site with six recharge ponds. In 1993, it expanded the site to 75 acres and 12 recharge ponds.

By 2001, the system served 20 customers via 25 miles of reclaimed water distribution pipeline and recharged more than 5 billion gallons of water. As an incentive, the cost of the reclaimed water is $0.03 per 1,000 gallons. An added benefit of the reuse project has been the development of a shoreline habitat for diverse plant species and a variety of birds, mammals, fish, amphibians, and insects that provides educational and recreational opportunities for local residents. In October 1999, Gilbert completed a 130-acre project with 7 percolation basins averaging 9 acres each that recharge up to 4 mgd of tertiary-treated effluent from the wastewater reclamation plant, as well as surface water from the Colorado River and from Salt River Project's system.

Summary of Results for Gilbert, AZ

Amount of water recharged	5 billion gallons
Number of recharge ponds	12
Number of reclaimed water customers	20

Resources

"Gilbert, Arizona," Center for Renewable Energy and Sustainable Technology, <www.crest.org>.

Gilbert, Arizona, Home Page, <www.ci.gilbert.az.us/water/index.htm>.

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Goleta, California: Avoiding Shortages and Plant Expansion

Background

The Goleta, California, Water District serves approximately 75,000 customers spanning an area of about 29,000 acres. Goleta's water supply comes primarily from Lake Cachuma (9,300 acre-feet per year) and the state Water Project (4,500 acre-feet per year). The district can also produce approximately 2,000 acre-feet per year from groundwater wells. In 1972, analysts predicted future water shortages in Goleta, so the district began seeking additional water sources and established a water efficiency program.

Approach

Goleta's water efficiency program cost approximately $1.5 million and emphasized plumbing retrofits, including the installation of high-efficiency toilets (1.6 gallons per flush) and showerheads. The program also included free onsite water surveys, public education, and changes in metering and rate structure. A mandatory rationing plan was imposed on May 1, 1989 to reduce use by 15 percent.

Results

Between 1987 and 1991, Goleta issued 15,000 rebates for high-efficiency toilets and installed 35,000 low-flow showerheads. Between 1983 and 1991, 2,000 new high-efficiency toilets were installed in new construction and remodels. Onsite surveys and public education efforts helped consumers improve outdoor water efficiency, and increased water rates provided extra incentive for consumers to reduce water use. The conservation and rationing programs, as well as the rate increases, contributed to a 50-percent drop in per capita residential water use in 1 year—between May 1989 and April 1990. Total district water use fell from 125 to 90 gallons per capita per day—twice the original target of 15 percent. The water-efficiency program also reduced sewage flow from 6.7 million gallons per day (mgd) to 4 mgd. As a result, Goleta Sanitary was able to delay a multimillion-dollar treatment plant expansion.

Summary of Results for Goleta, CA

Number of toilet rebates (1987–1991)	15,000
Number of toilets installed in new construction and remodels (1983–1991)	2,000
Number of showerheads installed	35,000
Reduction in per-capita residential water use	50%
Reduction in total district water use	30%
Reduction in wastewater flow	2.7 mgd (40%)

mgd= million gallons day

Resources

Goleta Water District, Home Page, <www.goletawater.com/html/framework/splash.html>.

"Residential Indoor Water Efficiency: Goleta, CA," Center for Renewable Energy and Sustainable Technology, <www.crest.org>.

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Houston, Texas: Reducing Capital Costs and Achieving Benefits

Background

The Houston Department of Public Works and Engineering serves a population of 1.7 million and provides water service to more than 553,000 retail connections. The city also sells wholesale water to 16 other communities. Houston receives an average of 50 inches of rain per year and has sufficient water supplies to meet demand through 2030, but 43 percent of Houston's water comes from groundwater sources that are threatened by increasing instances of land subsidence, saltwater intrusion, and flooding. In some areas, the land has actually subsided, or sunk, 10 feet. Conversion to surface sources or expanded use of surface water will require costly construction of water treatment plants and transmission mains. In addition, Houston is required by state regulations to reduce groundwater use 20 percent by 2030. These factors have led Houston to explore methods for managing its groundwater supplies.

Approach

Houston implemented water conservation programs to help reduce city expenditures and capital investments. In 1993, the Texas Natural Resource Conservation Commission also required Houston to implement a conservation plan to meet state requirements. The conservation program has four elements:

- Education program
- In-house program
- Contract customers program
- Conservation planning program

The education program consists primarily of outreach initiatives, as well as efficiency retrofits for older structures. The in-house program includes city irrigation audits, leak detection and repair for city pools and fountains, and analysis of city departments' water use. The contract customers program eliminated unnecessary requirements, required billing based on actual water use, and added penalties for excessive water usage during peak-demand periods.

The conservation planning program began in 1994 when Houston was awarded a grant from the Texas Water Development Board that financed a conservation planning study. The study examined the costs and benefits of more than 200 con-

servation measures. The conservation plan adopted by the city council in 1998 expanded existing educational and other programs to include residential water audits, appliance labeling, commercial indoor audits, cooling tower audits, public indoor and exterior audits, pool and fountain audits and standards, an unaccounted-for water program, increased public education, and a "water-wise and energy-efficiency program."

Houston also uses an increasing-block rate structure with two tiers for single-family residents. A minimum charge covers a base amount of water. Consumption between 5,000 and 12,000 gallons per month is billed an additional $2.36 per 1,000 gallons and consumption greater than 12,000 gallons per month is billed an additional $4.30 per 1,000 gallons.

Results

Since the program's inception, Houston has distributed 10,000 "WaterWise and Energy Efficient" conservation kits with high-efficiency showerheads and faucet aerators to area fifth-graders as part of a comprehensive education program, the majority of which were installed in homes. In addition, a pilot program at a 60-unit low-income housing development in Houston replaced 5 gallons-per-flush toilets with 1.6 gallons-per-flush toilets, fixed leaks, and installed aerators. At a total cost of $22,000, shared between the utility and the housing authority, the program reduced water consumption by 72 percent, or 1 million gallons per month. Water and wastewater bills dropped from $8,644 to $1,810 per month. These dramatic results have led the Houston Housing Authority to develop plans to retrofit more than 3,000 additional housing units.

The Houston City Council approved a new conservation plan on September 2, 1998 that includes a forecast of the savings from implementing the recommended water conservation measures. The plan predicts that implementation will reduce water demand by 7.3 percent by 2006. Including savings from continued use of efficient plumbing products in new construction and renovation, the overall demand forecast for 2006 will be cut by 17.2 percent.

Summary of Results for Houston, TX

Pilot Retrofit Program at 60-Unit Housing Development	
Fixture costs paid by water utility	$5,000
Fixture costs paid by housing authority	$6,000
Labor costs paid by housing authority	$11,000
Total cost of program	$22,000
Savings in water and wastewater bills from low-income pilot program	$6,834 per month
Activities and Water Savings	
Conservation kits distributed	10,000
Conservation kits installed	8,000
Average water savings from conservation kits	18% per household
Water savings from low-income pilot program (above)	72% (1 million gallons per month)
Predicted cut in water demand from conservation plan	7.3% (year 2006)
Total predicted cut in water demand	17.2% (year 2006)
Cost Savings	
Predicted benefit cost ratio of conservation plan	3.7 to 1
Predicted savings from conservation plan	$262 million

Resources

Daniel B. Bishop and Jack A. Weber, *Impacts of Demand Reduction on Water Utilities* (Denver: American Water Works Association, 1996), pp. 48-49.

City of Houston Water Conservation Branch Web page, <www.ci.houston.tx.us/pwe/utilities/conservation/>.

Edward R. Osann and John E. Young, *Saving Water, Saving Dollars: Efficient Plumbing Products and the Protection of America's Waters* (Potomac Resources, Inc., Washington, DC, April 1998), pp. 31-32.

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Irvine Ranch Water District, California: Reducing Purchased Water Costs Through Rates

Background

Irvine Ranch Water District (IRWD) in California provides water service, sewage collection, and water reclamation for the city of Irvine and portions of surrounding communities. The district serves a population of approximately 150,000 in a 77,950-acre service area containing 59,646 domestic and reclaimed water connections. IRWD delivered a total of 22.8 billion gallons of water between 1996 and 1997. The area has experienced considerable growth and development during recent decades. The district's service population grew by more than 75 percent in the 1980s and is projected to grow by 20 percent every 10 years. Population growth, drought conditions in the late 1980s and early 1990s, and increasing wholesale water charges led IRWD to choose conservation as one approach to meet the growing demand for water. The district is now a recognized leader in water reclamation and conservation programs.

Approach

IRWD adopted a five-tiered rate structure to reward water efficiency and identify areas where water is being wasted. The rate structure aims to create a long-term water efficiency ethic while maintaining stable utility revenues. IRWD individualizes rates for each account based on landscape square footage, number of residents, any additional needs of individual customers (such as for medical uses), and daily evapotranspiration rates (the amount of water lost through evaporation and transpiration of turfgrass).

Based on daily fluctuations in precipitation, each customer's rates are adjusted on each water bill to reflect estimated needs. When customers use more water than needed, they are given progressively expensive penalties. This individualized feedback alerts customers to excess use or leakage. Customers that correct a problem can request the removal of the penalties. Because IRWD does not depend on penalty revenues, such requests can be quickly and readily granted, leading to very high customer satisfaction ratings.

The five-tiered rate structure consists of the following:

Rate Tier	Amount and Basis
Low-volume discount	$0.48 per 100 cubic feet (ccf) for use of 0-40 percent of allocation ($0.64 per 1,000 gallons)
Conservation base rate	$0.64 per ccf for use of 41-100 percent of allocation ($0.85 per 1,000 gallons)
Inefficient	$1.28 per ccf for use of 101-150 percent of allocation ($1.71 per 1,000 gallons)
Excessive	$2.56 per ccf for use of 151-200 percent of allocation ($3.42 per 1,000 gallons)
Wasteful	$5.12 per ccf for use of 201 or greater percent of allocation ($6.85 per 1,000 gallons)

In addition to the consumption charges, all customers are billed a fixed water-service fee based on meter size, which ensures that utility revenues are permanently stable, regardless of the level of water sales. Residential customers with usage levels approximately 10 ccf/month are charged a flat sewer fee of $6.60 per month. Sewer fees are $0.74 per ccf ($0.99 per 1,000 gallons) for non-residential customers using more than 10 ccf per month. IRWD also imposes a pumping surcharge that varies from $0.11 to $0.56 per ccf ($0.15 to $0.75 per 1,000 gallons) for customers residing in high elevations. The average total residential water bill is approximately $20 per month.

Results

IRWD implemented the new rate structure in June 1991 and its impact was immediately evident. Water use in 1991/1992 declined by 19 percent, as compared to 1990/1991. Surveys show that customer satisfaction with the rate structure is highly favorable, reflecting 85 to 95 percent approval.

IRWD believes that the implementation of incentive pricing, especially the individualized customer water budget, made their other conservation programs more effective. Over the 6-year period between 1991 and 1997, IRWD spent approximately $5 million on other conservation programs such as irrigation workshops, water audits, and fixture rebates. During that time period, the estimated savings in avoided water purchases has been $33.2 million. Savings in landscape water totaled 61,419 acre-feet, valued at $26.5 million. Landscape water usage dropped from an average of 4.11 acre-feet to less than 2 acre-feet per year. The residential sector showed a 12 percent reduction in use following a major drought, because awareness of water conservation issues was still high. Since then, usage is, on average, 9 percent lower per household than in 1990. From 1992 to 1998, savings totaled 15,611 acre-feet, valued at $6 million in avoided purchases. IRWD also was able to avoid raising water rates for 5 years.

Summary of Results for Irvine Ranch Water District, CA

Water Savings	
Water savings (1990/91 to 1991/92)	19%
Landscape water impact savings (1991 to 1997)	61,419 acre-feet (20 billion gallons)
Residential water impact savings (1991 to 1997)	12% per year
Residential water impact savings (1991 to 1997)	15,611 acre-feet (5 billion gallons)
Water Cost Savings	
Conservation program (6-year period)	$5 million
Avoided water purchases (6-year period)	$33.2 million
Net savings in avoided water purchases (6-year period)	$28.2 million

Resources

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Lessick, Dale, "IRWD's Water Budget Based Rate Structure," Irvine Ranch Water District, January 1999.

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Massachusetts Water Resources Authority: Deferring Capital Needs Through Conservation

Background

The Massachusetts Water Resource Authority (MWRA) is a wholesale water provider for 2.2 million people in 46 cities, towns, and municipal water districts in Massachusetts. From 1969 to 1988, MWRA withdrawals exceeded the safe yield level of 300 million gallons per day (mgd) by more than 10 percent annually. Consequently, MWRA was under pressure to make plans to increase supply capacity. One plan it developed was to divert the Connecticut River, which would cost $120 million to $240 million (in 1983 dollars) and have an annual operation and maintenance cost of $3 million. MWRA also developed a plan for a new water treatment facility that complied with the Safe Drinking Water Act. The plant was originally designed with a 500 mgd demand maximum. Ultimately, the Commonwealth of Massachusetts determined that a water conservation plan would be the best initial solution for its supply needs, with other plans to follow as needed.

Approach

Although adequate precipitation helped avoid a major water-supply crisis during the 20-year period of exceeding the safe yield, MWRA began a water conservation program in 1986 to help address the supply problem. The conservation program included the following:

- Vigorously detecting and repairing leaks in MWRA pipes (270 miles) and community pipes (6,000 miles).
- Retrofitting 370,000 homes with low-flow plumbing devices.
- Developing a water management program for area businesses, municipal buildings, and nonprofit organizations.
- Conducting extensive public information and school education programs.
- Changing the state plumbing code to require new toilets to use no more than 1.6 gallons of water per flush.
- Improving meters to help track and analyze community water use.
- Using conservation-minded water/sewer rate structures on the community level.

Results

MWRA's conservation efforts reduced average daily demand from 336 mgd in 1987 to 256 mgd in 1997. The decrease in demand allowed for a reduction in the size of MWRA's planned treatment plant, as well as a 20-year deferral of the need for an additional supply source.

The present-value cost savings of deferring the water supply expansion are estimated to be $75 million to $117 million, depending on the initial capital investment. The capacity of the treatment plant has been reduced from 500 mgd to 405 mgd—an estimated $36 million cost reduction. Together, the deferral of the water-supply expansion project and the reduction in the capacity of the treatment plant amount to a total savings of $111 million to $153 million. The estimated cost of the conservation program is $20 million.

Summary of Results for Massachusetts Water Resources Authority

Water Savings	
Total demand reduction (1987-1997)	80 mgd
Capacity reduction of planned treatment facility	95 mgd
Capital Savings	
Present value savings of deferring supply expansion	$75-$117 million
Present value savings of reducing treatment plant capacity	$36 million
Total savings (deferring water supply and reducing treatment plant capacity)	$1.39 mil./mgd to $1.91 mil./mgd

mgd= million gallons per day

Resources

Daniel B. Bishop and Jack A. Weber, *Impacts of Demand Reduction on Water Utilities* (Denver: American Water Works Association, 1996), pp. 44-45, 98-102.

Massachusetts Water Resources Authority, <www.mwra.state.ma.us/water/html/wat.htm>.

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Metropolitan Water District of Southern California: Wholesale Conservation

Background

The Metropolitan Water District ("Metropolitan") is the wholesale supplier of water for Southern California. Metropolitan "imports" water for its 26 member water agencies from the Colorado River and Northern California, providing 60 percent of the water needed by a population of more than 17 million. In recognition of increasing demands and limited supplies, Metropolitan provides significant local assistance to develop more reliable local supplies through conservation, water recycling, and groundwater cleanup. Since its initiation in the late 1980s, Metropolitan has spent $155 million on conservation programs alone.

Approach

Metropolitan provides financial support for conservation programs in one of two ways—it pays local agencies either 50 percent of the cost of the water conservation project or $154 per acre-foot of conserved water, whichever is less. Projects are generally conducted in partnership with Metropolitan's member agencies, which include retailers and other wholesalers. Projects must directly or indirectly reduce the demand for potable water from Metropolitan. Examples include education and training, research, and support for new legislative initiatives or improved fixture efficiency standards.

One of the largest initiatives has been toilet retrofit rebates. More than 2 million pre-1992 toilets have been replaced with new high-efficiency toilets, thanks to local water agencies across the area. Other efforts have included water-efficiency site surveys, irrigation equipment improvements, distributions of new high-efficiency showerheads, rebates for high-efficiency washing machines, and research into toilet performance and leakage rates.

Results

As of 2001, the water savings from Metropolitan's conservation programs were estimated to be 66,000 acre-feet per year, or 59 million gallons daily. These savings are in large part due to the fact that residents in numerous municipalities replaced more than 2 million inefficient toilets with 1.6 gallons-per-flush models. The conservation credits program also resulted in the distribution of 3 million high-efficiency showerheads and 200,000 faucet aerators. Local offi-

cials in different areas surveyed approximately 60,000 households for water use information, and performed 2,000 large landscape irrigation audits. In addition, officials conducted 1,000 commercial water use surveys. Metropolitan's and its member agencies' efforts have made many customers view their water agencies as resources for finding solutions to high water use problems. Metropolitan is counting on conservation efforts to continue reducing demand in the future.

Summary of Results for Metropolitan Water District of Southern California

Conservation Program Activities and Water Savings	
Number of pre-1992 toilets replaced	2 million
Number of high-efficiency showerheads distributed	3 million
Number of faucet aerators distributed	200,000
Number of high-efficiency clothes washer rebates issued	20,000
Number of residential water-use surveys conducted	60,000
Number of large landscape irrigation audits	2,000
Number of commercial water use surveys conducted	1,000
Total water savings from conservation program	66,000 AFY (59.1 mgd)

AFY= acre-feet per year

Resources

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New York City, New York: Conservation as a Water Resource

Background

New York City's infrastructure includes more than 6,100 miles of water pipes and more than 6,400 miles of wastewater lines. By the mid-1970s, increased demand resulted in water-supply facilities repeatedly exceeding safe yields. By 1990, three of New York's wastewater treatment plants were exceeding permitted flows. Water and sewer rates more than doubled between 1985 and 1993 due to the cost of meeting federal mandates (including the prohibition of dumping sewage sludge into the ocean), the end of subsidies from the city's general revenue budget to the water and sewer system, and reductions in federal funding for water pollution control projects. The city faced the need for costly water-related infrastructure projects.

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP

www.nyc.gov/dep

In 1992, the city conducted an avoided-cost analysis of the available supply alternatives. It compared current supply costs with the costs of a toilet rebate program. In the end, conservation offered the most economical option.

Approach

Beginning in 1985, New York implemented a series of conservation initiatives, including education, metering (1985 to present), leak detection (1981 to present), and water use regulation. For example, the city initiated computerized sonar leak detection of all city water mains and used an advanced flow-monitoring program to help detect leaks in large sewer mains that lead to wastewater treatment plants operating at high capacity. The city installed magnetic locking hydrant caps between 1992 and 1995 to discourage residents from opening hydrants in the summer, and these are still used when appropriate.

A program to install water meters at unmetered residences began in 1991. The city also began conducting a door-to-door water-efficiency survey with homeowners that included educational information, free showerheads and aerators, and a free leak inspection. New York's program to replace water-guzzling toilets with high-efficiency toilets (1.6 gallons per flush) was a particularly impressive example of modern water-demand management. The program aimed to replace more than 1 million toilets over a 3-year period (1994 to 1997). Homeowners, apartment-building owners, and commercial-property owners received rebates of $150 or $240 per toilet.

Results

The leak-detection program saved 30 to 50 million gallons per day (mgd) in its early years and continued to help reduce losses. In 1996, leak detection and repair efforts saved approximately 11 mgd. Savings from metering total more than 200 mgd at a cost of $150 million. New York City performed more than 200,000 homeowner inspections, resulting in the elimination of more than 4 mgd in leaks. The city also replaced 1.3 million inefficient toilets between March 1994 and April 1997, saving an estimated 70 to 80 mgd. Customers realized 20 to 40 percent savings in total water and wastewater bills. Overall, New York's conservation efforts resulted in a drop in per capita water use from 195 gallons per day in 1991 to 167 gallons per day in 1998.

Summary of Results for New York City

Water savings from leak detection program	30 to 50 mgd
Water savings from meter installation	200 mgd
Homeowner inspections	200,000
Water savings from homeowner inspections	4 mgd
Number of inefficient toilets replaced	1.3 million
Water savings from toilet replacement program	70 to 80 mgd

mgd = million gallons per day

Resources

Edward R. Osann and John E. Young, *Saving Water, Saving Dollars: Efficient Plumbing Products and the Protection of America's Waters* (Potomac Resources, Inc., Washington, DC, April 1998), pp. 37-38.

U.S. Environmental Protection Agency, "Regional Approaches to Efficient Water Uses: Tales from the Trenches," Cleaner Water Through Conservation (1998), <www.epa.gov/OW/you/chap4.html>.

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Phoenix, Arizona: Using Less, Conserving More

Background

The Phoenix Water Services Department provides water for 350,000 retail connections and a population of approximately 1.3 million people in one of the fastest-growing communities in the United States. As the sixth largest city in the United States and the 17th largest metropolitan area, Phoenix also has the second largest land area of all cities in the United States. Average annual rainfall in Phoenix is 7.25 inches. Approximately 98 percent of Phoenix proper relies entirely on surface water, and the surrounding growth areas (consisting of an additional 1.5 million people) use a combination of ground and surface water sources. The major source of water is a very old agricultural reclamation project that has been devoted to urban use. This project has helped keep water prices the lowest in the area and lower than any other comparable city in the country. Unfortunately, the area's inexpensive water sources have been depleted, and new water-supply projects pose environmental and financial problems. The state legislature has required that after 2025, Phoenix and suburban communities must not pump groundwater faster than it can be replenished. Accordingly, the city has been pressed to either look for alternative surface supplies or reduce demand. City facilities—mostly parks—constitute the city's single largest water customer. Because of irrigation and cooling uses, Phoenix summer demand is nearly twice that of winter use. Planners determined that conservation was the best solution to the problem.

Approach

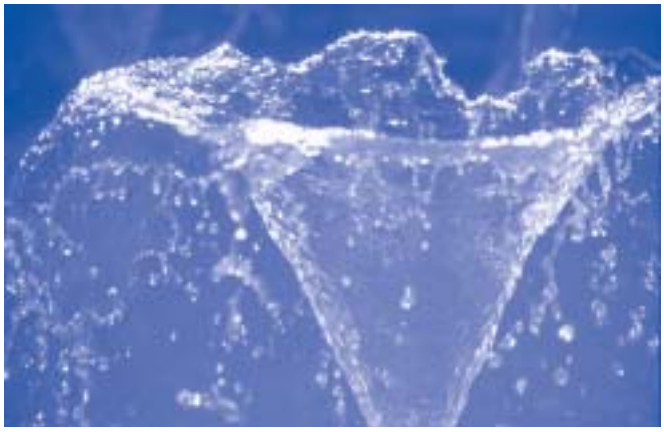
Phoenix has maintained a water conservation program since 1982 and, in 1986, the city approved a comprehensive water conservation program. The plan outlined five water conservation programs:

- Water pricing reform
- Indoor residential water conservation
- Industrial and commercial water conservation
- Plant and turf irrigation efficiency
- Water-efficient landscaping

Residential water use amounts to 70 percent of Phoenix's water deliveries; consequently, residential water conservation is a high priority. Phoenix uses a rate structure that nearly reflects marginal costs, with three seasonal variations reflecting the city's seasonal costs. The rate includes a monthly service charge and a volume charge that varies by season. Under the 1986 plan, Phoenix offered to replace old, high-flow fixtures (showerheads and faucets) in homes built before 1980. The program distributed educational materials, offered installation, and provided materials and support for community organizations to facilitate implementation. In 1990, the city amended its plumbing code to require water-conserving fixtures (including high-efficiency toilets) in new construction and renovation. That code requires the same flow reduction as those required 2 years later by the federal Energy Policy Act, 42 U.S.C., Chapter 77.

Phoenix's water conservation program provides assistance to low-income, elderly, and disabled customers. For more than 10 years, the city offered energy and water audits and plumbing retrofits through senior-citizen organizations. In another program, the city used high-school students to help low-income residents with audits, repairs, and replacements.

In 1998, Phoenix developed a new water conservation plan that focuses on public education and public awareness, technical assistance, regulations, planning and research, and interagency coordination. This plan focuses less on structural fixes, such as plumbing retrofitting, and more on changing behaviors and educating the next generation of water users. Many of the elements in the 1998 plan reflect a continuation or adaptation of elements in the 1986 plan. Other elements reflect new program initiatives in response to citizen interests and preferences. Most notable are mandates for school education programs, public education about conservation techniques, and city/citizen partnerships at the neighborhood level to address conservation needs. Phoenix was a key player in the development of the "Water—Use it Wisely" regional advertising and promotion campaign.



Results

Estimates suggest that by 1987, Phoenix's conservation program was saving approximately 20,000 acre-feet per year (18 million gallons per day (mgd)), which constitutes a 6 percent decrease in per-capita water use since 1980. From 1982 to 1987, Phoenix saved approximately 10,000 acre-feet of water per year (9 mgd) due to its conservation rate structure. A modified conservation rate implemented in 1987 saved an additional 25,000 acre-feet per year (22.5 mgd). Through the voluntary residential conservation program, more than 170,000 homes have been retrofitted with water-saving fixtures. Through programs for low-income, elderly, and disabled residents, the city installed approximately 1,500 high-efficiency toilets annually. Implementation of recent rate changes and water conservation measures has boosted average annual water savings to more than 45,000 acre-feet (40 mgd).

Summary of Results for Phoenix, AZ

Activities and Actual Water Savings	
Water savings from conservation programs (1982–1987)	20,000 acre-feet/year (18 mgd) (6% per capita)
Current savings from conservation program	45,000 acre-feet/year (40 mgd)
Number of homes retrofitted with water saving devices	170,000
Number of high-efficiency toilets distributed through low-income, elderly, and disabled program	1,500 per year

mgd = million gallons per day

Resources

Daniel B. Bishop and Jack A. Weber, *Impacts of Demand Reduction on Water Utilities* (Denver: American Water Works Association, 1996), pp. 48-50.

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Santa Monica, California: Conservation in a Sustainable City

Background

Like many Southern California cities, Santa Monica has faced rapid urban development and increased strain on water supplies. Residential customers consume approximately 68 percent of the water, while commercial and industrial customers consume 32 percent. The city draws water from local groundwater wells and imports water from the Metropolitan Water District of Southern California (MWD). Prior to 1996, the groundwater aquifers provided approximately 65 percent of total supplies. In 1996, the city found methyl tertiary-butyl ether (MTBE) contaminants in several wells, forcing Santa Monica to increase purchases to approximately 78 percent of total supplies. The city has four reservoirs with a total capacity of 40 million gallons for storing imported water. In 2002, 15 percent of supplies came from local groundwater and 85 percent from MWD.

In 1992, Santa Monica's city council initiated a Sustainable City Program. The program provides the city with a coordinated, proactive approach to implementing existing and planned environmental programs. The program consists of five major policy areas: (1) community and economic development, (2) transportation, (3) pollution prevention, (4) public-health protection, and (5) resource conservation. Resource conservation encompasses the city's programs in water, energy, recycling, and waste management.

Approach

Santa Monica has instituted a multifaceted approach to water conservation, including numerous policies and programs. The city's policies include:

- No Water Waste Ordinance
- Plumbing code
- Water-conserving landscape regulations
- Water demand mitigation fee
- Wastewater mitigation for large development projects
- Retrofit-Upon-Sale Ordinance
- Water and wastewater rate structure

Santa Monica's water conservation programs include:

- Residential water-use surveys
- Commercial and industrial water-use surveys
- Demonstration sustainable gardens
- Sustainable landscape workshops and garden tours
- Sustainable landscape guidelines
- California irrigation management information system
- Bay Saver Toilet Retrofit Program
- Water Efficiency Revolving Loan Program

The No Water Waste Ordinance regulates through notification-education—the use of fines for violating water use practices, such as lawn watering hours, hosing down driveways, swimming pool filling, and leakage. The Retrofit-Upon-Sale Ordinance requires the installation of water-saving plumbing devices whenever any residential or commercial property is sold or transferred. In 1996, the city modified the fixed and variable charges in the rate structure to encourage water conservation. Through the water use surveys, residents can receive free showerheads, faucet aerators, and garden-hose nozzles. The city encourages efficient irrigation and landscaping through several programs.

The Bay Saver Toilet Retrofit Program, at a total cost of $5.4 million, offers a $75 rebate for individuals to purchase and install high-efficiency toilets (1.6 gallons per flush). The Water Efficiency Revolving Loan Program provides no-interest loans to institutional, commercial, and residential water customers to pay for plumbing fixture retrofits, irrigation system upgrades, and other cost-effective water efficiency measures.

Results

Based on 1990 usage levels, Santa Monica established a water reduction goal of 20 percent by 2000. In 1990, water usage amounted to 14.3 million gallons per day (mgd). In one year, water use dropped almost 22 percent—to 11.4 mgd. The drop could be explained primarily by emergency measures instituted in response to a drought. When the city dropped the emergency measures in 1992, water use rose gradually to 12.3 mgd in 1995—reflecting a 14 percent savings from the 1990 level.

The city also established a wastewater flow reduction goal of 15 percent—from 10.4 mgd in 1990 to a target of 8.8 mgd in 2000. The city surpassed its goal by reducing flow to 8.2 mgd, a 21 percent reduction from 1990.

Santa Monica replaced more than 1,200 institutional plumbing fixtures in all city-owned or operated facilities. Between 1990 and July 1996, the Bay Saver Toilet Retrofit Program replaced more than 41,000 residential toilets and 1,567 commercial toilets. Estimates indicate that the program was

responsible for the permanent reduction of 1.9 mgd in water use and wastewater generation, as well as $9.5 million in avoided sewage treatment capacity purchases and avoided purchases of imported water.

Summary of Results for Santa Monica, CA

Activities and Water Savings	
Water savings, 1990-1995	2 mgd (14% decrease)
Number of residential toilets replaced	41,000 (53%)
Number of commercial toilets replaced	1,567 (10%)
Number of city-owned plumbing fixtures replaced	1,200
Wastewater flow reduction, 1990-1995	2.2 mgd (21% reduction)
Cost Savings	
Net savings from Bay Saver Toilet Retrofit Program	$9.5 million

mgd = million gallons per day

Resources

City of Santa Monica Environmental Programs Division, <pen.ci.santa-monica.ca.us/environment/policy/water>.

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Seattle, WA: Commercial Water Savings

Background

Seattle Public Utilities provides water to approximately 1.3 million people in Seattle and surrounding areas. The Seattle area has experienced steady population growth. Although the city is known for its rain, Seattle experiences dry summers with water demand at its peak due to increases in watering, irrigation, and recreation use. The Seattle area has very little carryover storage capacity from year to year and usually depends on the slow melting snow; an unusually dry winter can lead to summer water shortages. Adequate river flow is necessary for survival of the area's valued aquatic life, including Puget Sound's threatened Chinook salmon. The natural environment and the growing population compete for water resources, particularly during the dry season. Increasing demand and limits on existing supplies have forced the development of a dual strategy of demand reduction and cooperative supply management.

City of Seattle and 26 wholesale water utility partners

Approach

Seattle uses a multifaceted approach to water conservation. Strategies include an increasing block rate structure during the peak season for residential customers, plumbing fixture codes and regulations, operational improvements to reduce leaks and other water losses, market transformation to encourage and support water-saving products and appliances, customer rebates and financial incentives to encourage customers to use water-saving technology, and public education. Seattle targets several specific programs at residential customers. The Home Water Savers Program distributes water-efficient showerheads and provides free installation for apartments. WashWise promotes the purchase of resource-efficient washing machines through a mail-in cash rebate. Seattle also actively encourages water-wise gardening and landscaping, and the city strongly supports public education.

Seattle places special emphasis on its Water Smart Technology (WST) Program, in particular, understanding the needs and preferences of commercial customers to help them understand the benefits of conservation. The commercial program provides financial incentives, including technical and financial assistance, for the purchase and installation of cost-effective and water-efficient equipment, commercial toilet rebates for replacing older inefficient toilets and urinals, free irrigation-system assessments and audits, financial assistance for upgrading irrigation systems, and promotion of storm water and wastewater reuse.

Results

By all indications, Seattle's water conservation programs are successful. In the 1990s, annual average water consumption dropped 12 percent—from 171 million gallons per day (mgd) to 150 mgd. Per capita water consumption dropped by 20 percent. Estimates indicate that Seattle's water demand is approximately 30 mgd less than it would have been without conservation. Regional water consumption in 1997 was the same as in 1980. The seasonal rate structure is credited with saving close to 5 mgd since 1990. Plumbing codes and regulations have saved more than 4 mgd. Improvements in system efficiency have saved approximately 13 mgd since 1990. The Home Water Savers Program involved 330,000 customers and saved nearly 6 mgd.

Seattle's WST Program has been a remarkable success. Estimated median water savings for a commercial incentive program are approximately 6,000 gallons per day. More than 150 businesses have participated in the incentive program for total savings of approximately 1 mgd. By the end of 1997, 600 businesses participated in the commercial toilet-rebate program, replacing nearly 10,000 fixtures and saving approximately 0.8 mgd. Water efficient irrigation improvements for businesses have saved an additional 3 million gallons each year. Together, the commercial incentive programs could save Seattle approximately 8 mgd—reflecting a 20 percent overall reduction in commercial water use. The average avoided cost associated with new or expanded supply and transmission facilities is $1.89 per one hundred cubic feet ($2.53 per 1,000 gallons). On a per unit basis, commercial conservation programs have proved to be approximately twice as cost-effective as developing new supplies.

Summary of Actual and Projected Results for Seattle, WA

Water Savings 1990–1998	
Water savings from seasonal rates	5 mgd
Water savings from plumbing regulations	4 mgd
Water savings from system efficiency improvements	13 mgd
Home Water Savers Program participants	330,000 residences
Water savings from Home Water Savers Program	6 mgd
Water savings from commercial incentive programs	8 mgd
Commercial Toilet Rebate Program participants	600 businesses
Water savings from Commercial Toilet Rebate Program	0.8 mgd
Water savings from commercial irrigation improvements (1990-1998)	3 mgd

Cost Savings	
Conventional supply cost (avoided supply cost for all customers)	$1.89 per ccf ($2.53 per 1,000 gals)
Cost of commercial conservation	$0.93 per ccf ($1.25 per 1,000 gals)
Cost to participating customers	$0.36 per ccf ($0.48 per 1,000 gals)
Additional benefits to participating customers (water-bill savings)	$0.74 per ccf ($0.99 per 1,000 gals)
Net additional benefits (water savings less program participation costs)	$0.38 per ccf ($0.51 per 1,000 gals)
Total net benefits (avoided supply cost plus net additional benefits)	$1.42 per ccf ($1.90 per 1,000 gals)

ccf = hundreds of cubic feet

mgd = million gallons per day

Resources

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Tampa, Florida: Growth and Water Management

Background

Tampa Water Department

Florida's Tampa Bay region has experienced rapid economic and population growth for many years, and the demand for water has grown even faster. In the 1980s, Tampa's and Hillsborough County's population grew by 8 percent, and water demand grew by more than 25 percent. Florida experiences periodic droughts, with an average of four drought years in every 10-year period. In Florida, Tampa is unique for its heavy dependence on surface water supplies—75 percent of its drinking water comes from the Hillsborough River, which is greatly affected by periods of drought.

Approach

Since 1989, the Tampa Water Department has implemented several measures to reduce water usage, including water-conserving codes, an increasing-block rate structure, public education, in-school education, and other conservation projects. The city promotes water efficiency through water use restrictions, fines for water use violations, and plumbing and landscaping codes. Outdoor irrigation is limited to one day per week and prohibited between 8 a.m. and 6 p.m., and all new irrigation systems must have rain sensors. The city also provides homeowners with free Sensible Sprinkling irrigation evaluations and distributes free rain sensors. The landscape code limits the amount of irrigated turfgrass to 50 percent in new developments and encourages the use of Florida-friendly plants and low-volume irrigation methods.

The city modified the plumbing code to require water-efficient plumbing fixtures in all new construction and renovation. Tampa's Water Department began distributing water conservation kits to homeowners in 1989. The kits include toilet tank dams, efficient showerheads, aerators, leak detection kits, and information. In 1994, the department conducted a pilot toilet rebate program to retrofit toilets in existing buildings with high-efficiency toilets (1.6 gallons per flush). The pilot program was well received, with high rates of participation and product satisfaction. Tampa expanded the rebate program and now offers rebates as high as $100 for replacement toilets in single family and multi-family homes, as well as for commercial customers.

Results

Tampa has experienced much success with its water conservation programs. The Sensible Sprinkling irrigation evaluation program resulted in a 25 percent drop in water use. Estimates indicate that the distribution of more than 100,000 conservation kits resulted in savings of 7 to 10 gallons of water per person per day.

An evaluation of the pilot toilet rebate program revealed that household water use decreased from an average of 258 gallons per day to 220 gallons per day—a 15 percent reduction. The city replaced 27,239 older toilets with high-efficiency toilets, accounting for 245.9 million gallons of water saved each year. Although the city's water service population increased 20 percent from 1989 to 2001, per capita water use decreased 26 percent.

Summary of Results for Tampa, FL

Number of Sensible Sprinkling landscape evaluations performed	915
Water savings from Sensible Sprinkling landscape evaluation program	25%
Number of water-saving kits distributed	100,000
Water savings from distribution of water-saving kits	7 to 10 gallons per day per person
Number of inefficient toilets replaced	27,239
Water savings from toilet rebate program	38 gallons per day per household

Resources

Edward R. Osann and John E. Young, *Saving Water, Saving Dollars: Efficient Plumbing Products and the Protection of America's Waters* (Potomac Resources, Inc., Washington, DC, April 1998), pp. 46-47.

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Wichita, Kansas: Integrated Resource Planning

Background

A decade ago, analysts determined that Wichita's available water resources could not meet the city's needs beyond the first decade of the 21st century. Based on conventional operating practices, the city was fully utilizing existing water supplies and had no new supplies readily available. The city explored the option of drawing water from a water reservoir located 100 miles away. Due to the high cost of transporting water, as well as social, environmental, and political opposition, the city chose to reevaluate its options.

Wichita eventually opted for a more holistic approach to water management, in which water conservation is a significant component. In the early 1990s, the city adopted an integrated resource planning approach. The process of developing a long-term plan encouraged the involvement of various stakeholders, including the community, water users, and regulatory agencies. Ultimately, the group investigated non-conventional water sources that do not typically have firm yields.

Approach

The Wichita case is noteworthy for its very long-term perspective, the number and variety of water resource options considered, and the emphasis on regional coordination issues. The case is especially useful in recognizing how regulatory institutions affect the feasibility of water resource options. Regulatory considerations in Wichita included water rights, source water protection, drinking water standards, environmental impacts, and historic preservation.

Analysts in Wichita summarized the key elements of their "customized" integrated planning approach as follows:

- Implement water conservation to help control customer demand and water use.
- Evaluate existing surface water and groundwater sources to determine their capacity and condition, methods of enhancing their productivity, and ways to protect their quality.
- Evaluate nonconventional water resources for meeting future water needs.
- Optimize all available water resources to enhance water supply.
- Pursue an application for conjunctive water resource use permit from state agencies.
- Evaluate the effects of using different water resources on water supply, delivery, and treatment facilities with consideration of risk and reliability.
- Communicate with key stakeholders including regulatory agencies, other water users, and the public.

Results

The comprehensive analysis of resource options for Wichita resulted in a large matrix with a total of 27 conventional and nonconventional resource options and their key characteristics. For each option, the analysis considered: construction costs, expected available flow (including alternative scenarios when applicable), unit costs, general advantages and disadvantages, and specific implementation issues related to policy or political, legal, environmental, and water quality concerns. Analysts used a screening process to eliminate several options from further consideration, including the "no action" option (because of adverse economic development consequences). Then they ranked the remaining options in terms of overall desirability.

Planners in Wichita recognized that water supply operations are growing in complexity and that operational tradeoffs are necessary when implementing an integrated approach. The key benefit to better planning, however, is the more effective use of the region's water resources.

Summary of Results for Wichita, KS

Resource Alternative	Expected Yield (mgd)	Construction Cost ($mil)	Unit Cost ($/mil. gal.)	Rank*
Low-range water conservation	15	23	77	1
Little Arkansas River supply to water treatment plant	0 to 44	21	23	2
Little Arkansas River: subsurface storage	34	26 to 126	46 to 219	3A
Little Arkansas River: bank storage	7 to 39	6.2 to 175	45 to 221	3B
Little Arkansas River: bank storage	7 to 39	11.5 to 164	41 to 207	3B
Gilbert-Mosley remediated groundwater	3	1.5	25	4
Cheney Reservoir: operations modifications	up to 60	0	0	5
Reserve Wellfield	10.8	1.0	4.7	6
Reserve Wellfield (peak use only)	10.8	1.0	37	6
Cheney overflow pipeline to water treatment plant	28	53	96	7
Cheney overflow pipeline to water treatment plant	35	60	87	7
Equis Beds: purchase water rights	As available	$400/acre-ft	1,227	8
Milford Reservoir (existing)	60	155	141	9
Cheney overflow: subsurface storage	34	65 to 165	94 to 237	10
Treated wastewater reuse: local irrigation	1.1	15	1,336	11
No action	23	0	0	ns

Source: David R. Warren, et al., "IRP: A Case Study From Kansas," *Journal American Water Works Association* 87, no. 6 (June 1995): 57-71.

ns = not selected as a viable alternative based on screening level cost.

* Rankings were based on a variety of criteria, including, but not limited to, the cost criteria provided.

Resources

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Barrie, Ontario: Wastewater Capital Deferral

Background

Barrie, Ontario, is located 80 miles north of Toronto on the shore of Lake Simcoe. Due to rapid population growth, the city's groundwater supplies, managed by the Barrie Public Utilities Commission, suffered serious capacity limitations. In 1994, the city planned a new surface-water supply at a cost of approximately $27 million (Canadian dollars). Wastewater flows began reaching capacity at the Water Pollution Control Center, forcing consideration of a $41 million addition to accommodate future growth and development.

Approach

To help ease the water use burden, Barrie developed a conservation partnership with the Ontario Clean Water Agency (OCWA) and the Ministry of the Environment (MOE). The program focused on replacing inefficient showerheads and toilets and delivering information kits to homeowners and landlords. The city offered homeowners a $145 rebate per toilet and $8 per showerhead; the OCWA and MOE covered materials and program administration costs. The goal was to achieve a 50 liters per person per day (13.2 gallons per person per day) reduction in water use for 15,000 households, which would constitute a 5.5 percent reduction in average daily wastewater flows from the 1994 level.

Results

Between 1995 and 1997, a total of 10,500 households received 15,000 high-efficiency toilets (1.6 gallons per flush), representing 60 percent of the program goal. A pre-and-post analysis of participating households indicated an average reduction of 62 liters per person per day (16.4 gallons per person per day)—24 percent higher than the goal of 50 liters per person per day (13.2 gallons per person per day). Total program savings translated to 55 liters per person per day for the system (14.5 gallons per person per day). Based on the total number of participating households, the conservation program generated water savings totaling 1,628 cubic liters per day. More than 90 percent of the program participants were satisfied with the program and the products installed.

The reduction in wastewater flows in Barrie enabled a 5-year deferral of the capital expansion project at the Water Pollution Control Center. Water conservation efforts also made it possible to scale back the cost of the upgrade to

$19.2 million—for a net saving of $17.1 million after accounting for the cost of the conservation program. The reductions in wastewater flows and the planned upgrades at the facility mean that no new hydraulic capacity will be needed until 2011. Barrie also will delay construction of a lake-based water filtration plant beyond 2020 and defer the associated cost and rate impacts.

The conservation program also results in environmental, economic, and social benefits to the community. The conservation program is credited for creating more jobs than the proposed capital-works program, as well as preserving individual disposable incomes due to lower water and energy bills.

Summary of Results for Barrie, Ontario

Activities and Water Savings	
Participating households	10,500
Installations of high-efficiency toilets	15,000
Water savings in retrofitted homes	62 l/c/d (19 g/c/d)
System water savings from total program	55 l/c/d (14.5 g/c/d)
Wastewater flow reduction	1,335 m^3/day (0.35 mgd)
Capital Savings (millions of Canadian dollars)	
Original cost of upgrade	$41.0
Revised cost of upgrade	$19.2
Savings	$21.8
Cost of program	$4.7
Net capital deferral	$17.1

l/c/d = liters per capita per day; g/c/d/ = gallons per capita per day;

m3 = cubic meters; mgd = million gallons per day

Resources

"Canadian City's Water Conservation Project Produces Multiple Benefits," *Water Online* (1/14/99).

City of Barrie, <www.city.barrie.on.ca/edopages/wstwtr.htm#cons>.

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United States Environmental Protection Agency
Office of Water (4204M)
EPA832-B-02-003
July 2002
www.epa.gov/owm/water-efficiency/index.htm

Attachment 6, Part 2

Conservation Limits Rate Increases for a Colorado Utility

Demand Reductions Over 30 Years Have Dramatically Reduced Capital Costs

NOVEMBER, 2013

Alliance *for* Water Efficiency

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Why are my rates going up again?

"Why do you ask me to conserve and then raise my rates?" asked a concerned citizen at a public meeting in Westminster, Colorado in 2011.

"Very good question," pondered Westminster Utilities' staff as they struggled with only limited success for a compelling answer. They knew water conservation has had a profound impact on the city by reducing demand, the amount of additional water needed to purchase and eliminating the need for expansion of facilities, but they didn't have a good way to quantify the impacts and respond to the citizen's question.

Similar tough questions have been posed to water utilities across the country as water and wastewater rates have increased faster than the Consumer Price Index (CPI) over the past 15 years, (Beecher 2013), (Craley and Noyes 2013). Managing the public response to and understanding of rate increases has taken on increasing significance in recent years as utilities grapple with the double edged sword of rising infrastructure costs and decreasing demands (Goetz M. 2013).

Rather than leaving the question of customer conservation and rates hanging without a satisfactory response, the Westminster staff decided to do some research to try and come up with some answers using data from their own system. The timing of the question was significant as the City is working towards completing a series of identified projects designed to meet the City's needs at a projected buildout date of 2050 (using current and projected demands which include conservation).

To examine the impact of conservation on rates, the City looked at marginal costs due to the buildout requirements by removing conservation from the equation. The results of the City's research were startling: Reduced water use in Westminster since 1980 has resulted in significant savings in both water resource and infrastructure costs, saving residents and businesses 80% in tap fees and 91% in rates compared to what they would have been without conservation.

The City's research on water demands and rates since 1980 provided a useful response to the citizen's question and revealed previously unexplored and under-appreciated benefits of long-term water conservation in reducing rate increases. Water rates in Westminster are much lower today than they would have been in the absence of demand reductions from conservation. Here's how the City was able to reach this important conclusion.

Change in Water Use

To explore the impacts of demand management on water rates and tap fees, Westminster staff examined water demand records, water rates, tap fees[1], and capital project costs from 1980 through 2010 with the following question in mind: "What would our water rates and tap fees be today if per customer water demands remained unchanged since 1980?". 1980 was chosen because it predated City related conservation programs and two levels of plumbing code related changes.

The first step was to examine water use patterns. To do this, Westminster staff examined water use patterns from 1980 – 2010 by taking total demand (all customer classes) and dividing by the best estimate of the service area population for each year. Westminster has a reclaimed water system that reuses treated wastewater for irrigation thus lowering the City's impact on water resources. To be conservative, reclaimed water was assumed to be a conservation measure. This consumption was added back into potable water use to reflect the full use of water without conservation. As shown in Figure 1 average gpcd, based on total City water use, was 21% higher 30 years ago, starting at 180 gpcd in 1980 and ending at 149 gpcd in 2010. Westminster attributes these changes in demand to three primary management factors:

1. Utility sponsored water conservation programs
2. The City's inclining block and seasonal rate water billing structure
3. National plumbing codes implemented as part of the Energy Policy Act of 1992 (EP Act)

1 Tap fees, also called connection fees or development fees, are the costs paid by new customers to join the water system.

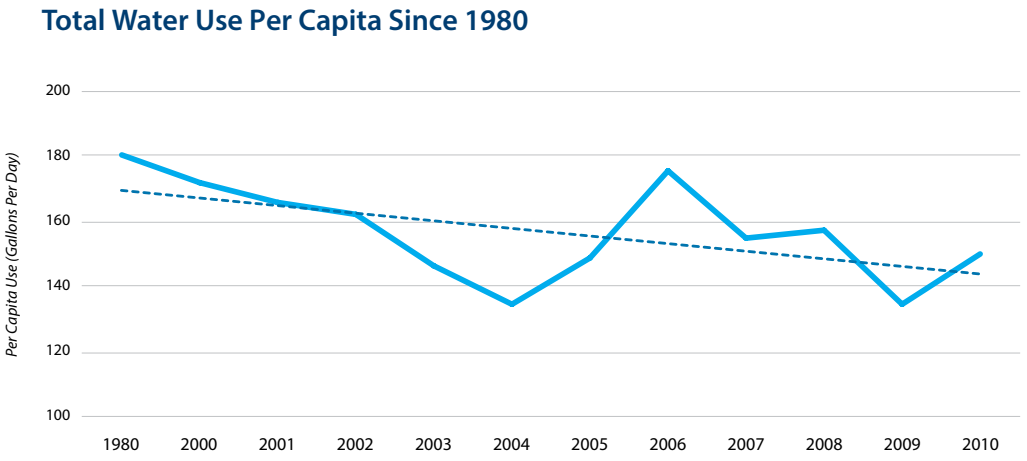


Figure 1: Average gpcd in Westminster, based on total water use 1980 – 2010

New Supply Requirements and Cost

Once the changes in water demand were quantified, the Westminster staff were able to estimate what water use in 2010 would have been without the enactment of water conservation programs and policies. Through this analysis it was concluded that if per capita water use had not decreased by 21%, Westminster would have been required to secure an additional 7,295 acre-feet (AF) of additional water supply order to meet the customer demand while satisfying the City's reliability requirements.

New water supply in Colorado's Front Range does not come cheap. Current market costs for new water supply average $30,000 per acre-foot on Colorado's Front Range. Westminster pays close attention to the cost of new supply as it builds these costs into the tap fees of new customers so that the City can fully recover the expense of serving new customers without burdening existing customers with the cost of growth. The staff also concluded that had conservation from 1980 – 2010 not occurred, the City would have been competing with other water providers in the region to acquire more raw water, further tightening the market and making new water supply even more expensive. At this average price, the estimated cost of obtaining and delivering the required additional 7,295 AF of water would have required a capital investment of $218,850,000. With this simple analysis alone, the cost savings associated with reduced water use became obvious, but staff realized this was only part of the story.

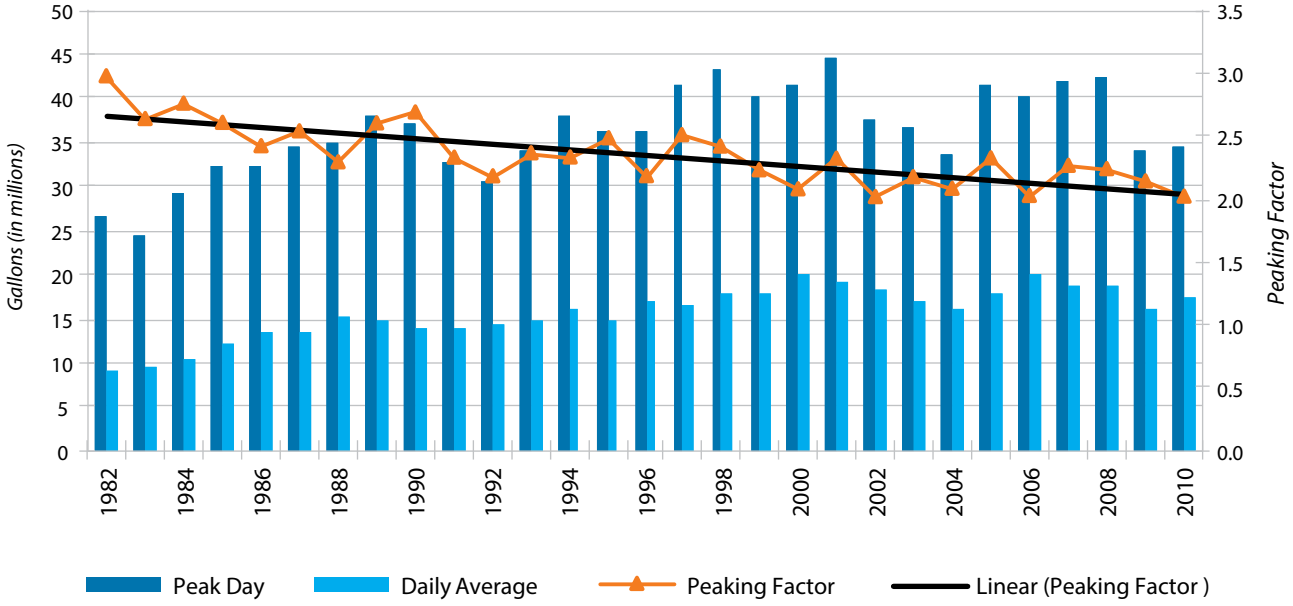
If per capita water use had not decreased by 21%, Westminster would have been required to secure an additional 7,295 acre-feet (AF) of additional water supply order to meet the customer demand.

Additional Peak Demands and Infrastructure Costs

Peak demand in 2010 would also have been considerably higher had conservation not been implemented in Westminster over the past 30 years. The City has found that water conservation programs have altered irrigation patterns thus reducing the system's peak day factor. In 1980 the peak to average day factor in Westminster was 3.0, but by 2010 changes in irrigation practices and reduced water demand cut the peak factor to 2.1 — a 30% reduction.

Potable Water Production

Peak Day, Daily Average, Peaking Factor



If 1980 demand levels had been perpetuated along with the 1980 peaking factor of 3, then the City's peak requirement at buildout was estimated to be 52 MGD *higher* than the current planned maximum capacity. This level of peak demand would require the City to add an additional 52 MGD of treatment capacity at an estimated finished and installed cost of $2,500,000 per MGD[2]. Developing the additional water treatment infrastructure to meet these higher demands would have required a capital investment by the City of approximately $130,000,000.

2 Based on recent projects and engineering estimates

Additional Wastewater Treatment Infrastructure Costs

If conservation were not taken and water demands had stayed at 1980 levels, staff determined that Westminster would have needed to add an additional 4 MGD of wastewater treatment capacity to their system. Adding wastewater treatment capacity costs the City an estimated $5,000,000 per MGD[3]. Thus the additional 4 MGD of wastewater would have required a capital investment by the City of approximately $20,000,000.

Total Estimated Costs of Increased Demand

All estimated costs associated with the hypothetical increased demand were assembled into a single table and then the City added in the costs of debt financing charges which would certainly have been part of these capital construction projects, had they been implemented. As shown in Table 1, had the citizens of Westminster not reduced their water use, the estimated total cost to the City of the increased demand came to $591,850,000 – more than half a billion dollars.

Table 1: Estimated new infrastructure costs of increased demand

Additional water treatment capacity	52 MGD total ($2,500,000/MG)	$130,000,000
Additional wastewater treatment capacity	4 MGD total ($5,000,000/MG)	$20,000,000
Additional water resources	7,295 AF total ($30,000/AF)	$218,850,000
Interest (on debt funding for all projects)*		$223,000,000
Total Costs		**$591,850,000**

** For the purposes of this analysis it is assumed that debt would have been issued, and the resulting debt service would have been paid through rates. Those costs were included in the impacts to rates.*

3 Based on recent projects and engineering estimates

Next the staff examined the increases in operating costs that the City estimates it would have incurred to handle the increased demand and associated additional infrastructure. While no additional staff personnel were assumed to be necessary, it was assumed that operating costs (power, chemicals, and other annual costs related to water and wastewater treatment, distribution and collection) would increase proportionally to the demand increases as shown in Table 2. From this analysis, it was estimated that Westminster would have incurred an additional $1,238,000 per year on average in operating costs associated with the additional demand.

Table 2: Estimated additional operating costs of new demand*

Additional annual operating cost of water treatment facilities	21% increase	$480,400
Additional annual operating cost of wastewater treatment facilities	20% increase	$757,600
Total estimated additional operating costs		**$1,238,000 per year**

**No additional staff personnel were added*

Impact to Water and Wastewater Rates and Tap Fees

Once the cost estimates were completed, the question of how to recover the additional costs through rates and fees was examined. Westminster Utilities has just two sources of revenue that it must use to pay for all costs associated with running the water and wastewater systems: (1) Water and wastewater rates; and (2) Tap fees. In theory, water and wastewater rates are set by the City so that the revenue generated covers operations and maintenance of the system as well as some of the repair and replacement costs, and debt service. Tap fees are set to cover the costs of buying into the existing system based on current value plus any new infrastructure (capital projects), and water resources required by growth.

In practice, existing customers build the City's water and wastewater systems before new customers arrive so that growth can occur. Infrastructure must be planned for future demands and not constructed as needed. When new customers connect and pay their tap fees, current customers are reimbursed for their investment in the City's existing systems. Those funds pay for capital improvement projects including repair and replacement, thus reducing the costs to existing customers. Therefore, both rates and tap fees are impacted by the same projects.

Working from this basic division of costs between rates and tap fees, Westminster developed an estimate of what 2012 water and wastewater rates and tap fees for single-family customers would need to be to cover the additional costs incurred as a result of the hypothetical additional supply requirements. In 2012, the average single-family customer in Westminster paid a total of $410 for water and $245 for wastewater service. To cover the single-family sector's share of the additional annual costs associated with the increased demand considered in this analysis, the average single-family customer would have to pay an additional $553 per year for water service and $43 per year for wastewater service. The weighted average of these additional costs means that the average single-family customer would pay combined water and wastewater rates that are 91% higher than they are today if 1980-level water demands were perpetuated over the past 30 years. These results are shown in Table 3.

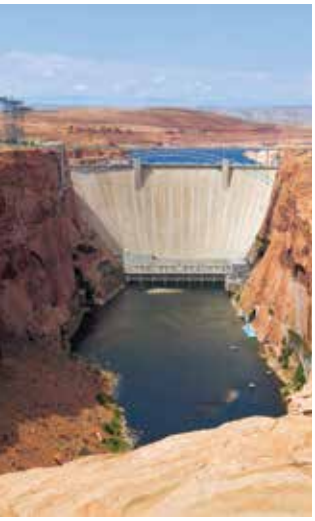
Table 3: New single-family rates and fees required to pay for additional demand

	Total Avg. Per Customer Charges in 2012	Additional Charges Required to Cover New Costs	New 2012 Annual SF Water/Sewer Bill	% Increase in Charges from Additional Demands
Water	$410	$553	$963	135%
Sewer	$245	$43	$288	17%
Total	$655	$596	$1,251	91%

A similar analysis was conducted to examine the impact of increased demands on tap fees for new customers in Westminster. In 2012 the average tap fee for a new customer (residential and non-residential combined) was $21,229, of which 77% was for water and 23% was for wastewater components. The combined cost of new infrastructure, new water resources, and repair and replacement associated with the increased demand modeled in this analysis would require an 80% increase in the average tap fee, up to $38,181 as shown in Table 4.

Table 4: New tap fees required to pay for additional demand

	Avg. Per Customer Tap Fee in 2012	Additional Tap Fee Charges Required to Cover New Costs	New 2012 Avg. Tap Fee	% Increase in Charges from Additional Demands
Water	$16,325	$16,086	$32,411	99%
Sewer	$4,904	$866	$5,770	18%
Total	$21,229	$16,952	$38,181	80%



With Conservation Rates Go Up, But Not Nearly as Much

There is a commonly held belief in the water industry that declining per capita usage due to water conservation has "forced an increase to rates to account for fewer units of volume billed" (Craley and Noyes 2013). But the rate increases necessitated by conservation are actually much smaller than the rate increases that would be necessary to account for population growth in the absence of conservation. The 21% reduction in average per capita water demand that Westminster has experienced over the past 30 years has resulted in significant benefit to its customers and reduced the rate of increase in water and wastewater rates. While water and wastewater rates and tap fees have increased over that 30 year time period, they have increased much less than they would have. Customers in Westminster have avoided increasing their water rates by 99% and their wastewater rates by 18% had this level of water conservation not been achieved. New customers in Westminster have also avoided an 80% increase in water and sewer tap fees. Yes rates have gone up, but because of the costs associated with new water supply and infrastructure, they have gone up much less than they would have.

An answer to the citizen's question about water conservation and rates had been found and the result was far more dramatic than the staff had anticipated. The next time a question was posed about the relationship between conservation and water rates, the Westminster staff was prepared with an answer: Water rates are going to increase with or without water conservation because the costs of operating and maintaining the water system continue to increase. However, water rates increase at a much slower rate if citizens conserve because the city does not need to purchase expensive new water supply and construct expensive new infrastructure. The net results of water conservation is a significant cost savings to the customer in water and wastewater rates and in tap fees.

Each water system is unique, so the results from Westminster may not be applicable to everyone. Utilities could perform a similar analysis to see the real value of conservation. However, the over $590 million dollar cost associated with the additional 7,295 AF of demand reveals the significant hardship associated with expanding water resources supply and wastewater treatment infrastructure in today's environment. The high cost also highlights the tremendous value that is inherent in a utility's water treatment, wastewater treatment and delivery infrastructure. Imagine the cost of obtaining water rights and constructing an entire water supply system today. The cheapest water (by far) is the water we already have and the best way to keep rates and tap fees low is to conserve the water we already have. The cost of water to providers may vary by region but the cost of infrastructure remains more consistent. The least expensive infrastructure to build, operate and maintain is the infrastructure that isn't needed in the first place. Conserve water or don't conserve water – your rates will go up – but if conservation is the lowest cost source of new supply (and it almost always is) then your rates will go up less than they would have without conservation.

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Attachment 6, Part 3

The Business Case for Water Conservation in Texas

Chris Brown Consulting &

Lower Colorado River Authority

June, 2007

Table of Contents

1.0 Executive Summary

Water conservation is of growing importance as a service of water suppliers and utilities throughout Texas. Increasing water use efficiency is not just good policy; it makes good business sense to include water conservation as a water resource strategy.

In the 2007 State Water Plan, 14 of the 16 regional water planning groups recommended municipal water conservation strategies as a potential way to meet future water needs. These strategies account for seven percent of the water required in 2060 (23 percent including agricultural and industrial strategies). The statewide average for municipal water conservation strategies was $254 per acre foot whereas new major reservoirs averaged $374 per acre-foot, other surface water projects averaged $254, and new ground water sources average $260 per acre-foot. Attachment A shows the ranges of estimated cost per acre-foot for various conservation measures that each water planning region adopted. These costs do not take into account avoided water treatment and maintenance costs, another financial benefit of conservation that the City of Austin and San Antonio Water System have used to justify costs of conservation programs. Numerous utilities have found that the cost/benefit ratios are sufficient to justify programs such as offering rebates or free water-saving fixtures and water audits to their customers as part of their overall water conservation program. For example, avoided cost analysis, which accounts for the total costs of new water supplies, has shown a 4:1 to 7:1 benefit-to-cost ratio for water conservation programs in the SAWS water service area.

In recent decades, the rate of increase in utility costs has outstripped the rate of inflation. This is due to increases in infrastructure replacement costs, energy costs, and in the costs of building new water supply projects. The costs of new supply are not only related to the costs of materials; it takes longer to build a new reservoir as sites become more difficult to locate, obtaining permits is more complicated, and conflicts with others users of a water source and interventions by interested third parties involve greater public relations and legal costs.

Utilities and regional water authorities around the country and in Texas have found that conservation programs help them manage demand and foster good customer relations while maintaining the health of their organizations. Toilet replacement rebates, water system audits, increasing block rate structures and publicity campaigns such as Water IQ are all examples of Best Management Practices (BMPs) have all been used successfully to achieve greater water use efficiency. These BMPs can be categorized into structural, operational, economic, and educational measures. The scope and limits of conservation efforts are defined by the potential water savings and costs. For example, El Paso Water Utilities cost per acre foot savings for conservation programs ranges from $5 for air conditioning cooling clamps to $490 for turf replacement, well below the cost of the next water supply. Since conservation planning in Texas is voluntary, adoption at the local decision-making level by a utility, water district, or regional water authority yields the greatest success.

Texas can benefit from the conservation lessons learned and tools developed in other states and regions. Regional partnerships, web-based reporting, and clearinghouses to promote conservation can all be tailored to Texas situations. Important state services should include increased technical support and consistent message development, such as the Water IQ campaign, that communicate

to end-users the importance of using water efficiently. In addition, the state should develop new avoided-cost methodologies to assist utilities to properly calculate total costs of water, including sunk costs like replacement of infrastructure, and assist utilities in preparing for the increased impact of energy costs in the future. This includes the development of new web-based tools for estimating water savings and costs, and uniform reporting of conservation results. A mechanism for providing state grants or low-interest loans to utilities could accelerate implementation of conservation measures for long-term efficiency.

Whether because of strains on water supply due to growth, desire to keep costs down, concerns for the environment, or assisting customers to reduce their water bills as costs of service rise, implementing water conservation measures can be a cost-effective strategy for a water supplier or utility.

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2.0 Situational Assessment

Texas water utilities have increasingly encouraged conservation since the 1980s, but water conservation became a statewide priority in 1997 with the passage of Senate Bill (SB) 1, when regional planning groups were required to consider water conservation strategies first as a water management strategy. SB1 also included an interbasin transfer provision that requires the entity requesting an interbasin transfer to implement a water conservation plan that will result in the highest practicable levels of water conservation and efficiency achievable within the jurisdiction of the applicant.

In 1999, TCEQ rules were adopted that required major water rights holders to develop and implement conservation plans. In 2003, SB 1094 passed that formed the Texas Water Conservation Implementation Task Force, to develop a series of statewide conservation program and policy recommendations. During that same legislative session, the TCEQ rules were revised to require that water conservation plans include 5 and 10 year goals, with the first report on implementation due to the TCEQ in May of 2009.

Finally, significant water conservation legislation was passed during the 2007 session which will require more utilities to develop and implement plans. All entities required to have plans will now be required to provide an annual report to the state on plan implementation, Other significant pieces of legislation include development of a Water Conservation Advisory Council and a statewide water awareness campaign.

2.1 Water Supply and Water Supply Planning

Projected and actual population growth in Texas drive increased water demands. The Texas Water Development Board's (TWDB) State Water Plan covers a 50-year horizon and, based upon current data, projects water demands to grow by 27 percent while population more than doubles.

How can Texas meet this increasing demand for water? Water conservation as a statewide priority has been growing since 1997. The 2002 State Water Plan recommended that water conservation measures meet 13.5 percent of projected unmet demands by 2050 or 987,914 acre-feet. In the 2007 State Water Plan, conservation measures more than double, to satisfy 2 million acre-feet or almost 23 percent of unmet demands in 2060. More than 2/3 of this conservation is projected to meet agricultural demand, as compared to municipal water conservation strategies, which are projected to meet 616,679 acre-feet (7 percent) of water demand in 2060 (TWDB, 2007).

The 2007 State Water Plan presents weighted average costs for major categories of water management strategies. The capital costs average $374 per acre-foot for new major reservoirs and $254 per acre-foot for other surface projects. New ground water sources average $260 per acre-foot. Conservation strategies average $254 per acre-foot, water reuse strategies average $248 per acre-foot and desalination strategies average $671 per acre-foot. Attachment A shows the ranges of estimated costs for various conservation measures that each water planning region adopted. The regional water planning groups were not required to report the cost per acre-foot for individual conservation measures, so in many of the plans, the costs are "bundled" into a

grouping of conservation strategies. The costs range widely due to some strategies requiring more active involvement by utility staff and defined expenses (e.g. rebate programs), and others requiring little or no active involvement or long-term cost (natural replacement of clothes washers, water conservation pricing). Most regions used TWDB's cost quantification study (TWDB/GDS, 2002) and TWDB's BMP Guide to determine conservation costs. In some regions, conservation strategies that had no cost associated with them in a given decade were averaged in, resulting in lower averages in the 2007 Water Plan Database than in the Regional Water Plan text. Both the conservation strategies selected, as well as the calculations of cost savings, varied greatly between regions.

2.2 Water Utility Infrastructure and Operations

Overall, water rates are rising faster than the rates of inflation and other utilities. Significant portions of these costs are for energy to move new water supplies further distances and repair and replacement of aging infrastructure. Reliable estimates of the nationwide gap between current spending and the cost to meet needs over the next 20 to 30 years range from $70 billion to more than $500 billion (US EPA, 2002; Congressional Budget Office, 2002; AWWA, 2004).

For utilities with high summertime peaking factors, both pipes and pump stations must be sized to handle increased capacity. The greater the peak demand, the greater will be the costs of these additions. Requirements for fire protection and use of water for outdoor landscape irrigation both affect the maximum flow recorded for the peak hour. Treatment plant, distribution, and storage sizing decisions are based upon growth projections of 10 to 20 years. Cities that have reduced or delayed their infrastructure replacement costs by managing peak demand include Seattle, WA, and Austin, TX. Seattle's "1 Percent" program is designed to maintain level demand for a period of 10 years despite population growth (Dietemann, 1998). Analysis of Austin's water conservation efforts in the 1990s indicates the city delayed construction of a new water treatment plant by 2.7 years.

2.3 Customer Service

Utilities often consider conservation a potential loss of revenue to the system as they conduct their financial evaluations. Utilities may focus on potential negative customer feedback from implementing increasing block rate structures, or water waste ordinances, but often overlook the positive effects conservation programs can have on customer relations. The LCRA has found that customers are often very pleased with the individual attention that comes with irrigation audits conducted due to high bill complaints or high water use mailouts. This situation may be the only time the customer has ever met a utility representative. Conservation education programs can also portray the utility in a very positive light. The Major Rivers program teaches students and teachers not only about conservation but about the services that LCRA provides. Statewide, the Major Rivers program has increased awareness of conservation and water supply issues among teachers, students and utility representatives.

3.0 The Economics of Water Conservation

3.1 Average versus Marginal Cost of Water

The typical water utility's financial model uses water rates to recoup the cost of serving its customers. It treats water as a commodity, and the price set reflects the combined capital costs for storage, distribution, and treatment and, sometimes, the cost of water. In Texas, most municipal water use is metered, and generally customers are charged according to their actual water use. Most utilities also recoup some of their high proportion of fixed costs in the form of a meter fee. Commercial rates are typically different from residential rates. Commercial customers' usage profiles tend to be more consistent throughout the year, with less demand for summer peaking capacity. The economic motivation for customers to conserve is that their bill will be lower, although rates may rise seasonally or with time.

For ease of calculation, average cost of service is typically used rather than a rate calculated for each unit of water supplied. Thus, those with lower demand are actually subsidizing higher quantity users, because the utility is developing expensive water supplies and infrastructure in order to sustain peak delivery capacity. The value of the water itself is often lost in all of these calculations – the actual value of a unit of water is often set at zero (Griffin, 2006). The much greater costs, associated with developing, delivering, and treating water supplies, are expected to take the place of actually valuing the water itself.

During drought or time of stress on water demand, as when a utility approaches its distribution system's capacity to deliver water or its reservoir capacity is reached, the limitations of the average-cost method become obvious. When a utility must put water-use restrictions in place in order to avoid exceeding its capacity to deliver water, a price based upon average cost results in the utility losing revenue. At the same time the utility needs new and continuing revenue for a new water supply, to make up for shortfalls from limited deliveries, or to repair pipes damaged by shrinking soils and changes in water pressure as peak-day demands increase. Pricing mechanisms like surcharges have been used to reduce the financial impact of drought and to send a stronger price signal to those who continue to use high quantities of water during a shortage (LaFrance, 2006). Drought is an emergency, but the limits on supply and capacity and the impending financial impacts are margins good water resource planning can anticipate.

One method of reflecting these marginal impacts of higher than average water demand on the system is in the water rate structure. The impact of high use on the water system overall can be reflected in multi-tier increasing block rate structures. Seasonal rates send a similar price signal during times when demand is highest and the utility is most likely to suffer shortfalls in supply. Although the cost of water in a customer's budget is oftentimes not significant enough for price alone to stimulate conservation, experience has shown that some customers will reduce demand if their bills rise sufficiently. (See section 4.3.)

Careful analysis of demand and supply curves and cost comparisons with new supplies demonstrate the attractiveness of water conservation programs. The net present value of most conservation programs compares favorably in the short run with higher expenditures for new water supplies, treatment plants or increased system capacity (specific examples are provided in section 3.2). Therefore, the financial goal of a conservation program, in purely economic terms, is to delay into the future the need to invest in one of these more expensive options.

San Antonio Water System (SAWS) developed a unique conservation rate structure in the 1990s. To ensure that long-term conservation was not subject to the whims of future water managers, the San Antonio City Council acted in 1994 to dedicate 50 percent of the fourth-tier residential revenue to conservation. Three years later a fee per meter was approved for ICI customers. SAWS's conservation budget is a separate line item in cost-of-service calculations.

3.2 Avoided Cost of Water Conservation

Water conservation is not the same as purchasing a material good, but is, rather, avoiding the demand and cost for a new source. It is necessary to calculate the total cost of the next unit of water — the long-run marginal cost — in order to properly value the avoided cost of a water resource. More conservation measures can be justified by cost/benefit analysis using avoided cost calculations.

Smaller utilities lack the budget or internal skills to perform such analyses. The regional planning process lacks the funding to develop the data to provide the differences in value to each water user group. While the State Water Planning process appears to show that water conservation is a cost-effective water resource strategy in most parts of the state, the calculated savings are less than would be expected, because all the costs of the next unit of water are not included.

In 2003 SAWS commissioned a cost/benefit analysis (BBC, 2003) that shows a likely value of water conservation to Texas utilities. The analysis looked at costs avoided by their conservation program: capital costs of new water supplies, as well as operational and maintenance savings for both potable water delivery and wastewater treatment from 2010 to 2060. Based upon a low estimate of demand increase, the study showed these measures — without conservation — provided fiscal benefits with a net present value of $870 million to $1.43 billion. The cost of the conservation programs that would yield commensurate results was $210 million. The benefit-to-cost ratio thus ranges from a little more than 4:1 on the low end of savings to a high of almost 7:1. The study also mentioned specifically that savings from conservation programs allowed SAWS to optimize the use of existing wastewater treatment plants to avoid building a new plant. The average cost per acre foot for SAWS conservation programs was $222 in 2004 (see Attachment B). That cost is expected to rise as lower cost programs saturate the service area.

A study commissioned in 2006 by the City of Austin compared the programs of the four Texas water utilities with the largest conservation programs and their success, as measured in per capita daily savings. Reported as trailing five-year averages, the savings were 7 percent for Austin, 33 percent for SAWS and 38 percent for El Paso (Austin, 2006). Dallas currently reports (Strong, 2006) that, since it began its water conservation program in 2001, it has seen an 11 percent

reduction in water demand (Enviromedia, 2004). Costs for these savings ranged from $6 million a year for SAWS to $3.6 million for Dallas in the most recent year reported. It is challenging to appropriately compare results from different parts of the state due to differing motivation for conservation (e.g. high alternative water supply costs, reduction in peak day demand to avoid/delay new infrastructure costs, or environmentally sensitive habitat requiring spring flow), but it is clear that these four cities are making progress through conservation.

The TWDB has two models that have been used to calculate the cost-effectiveness of water conservation. These models employ widely accepted engineering cost-estimating techniques and net-present-value calculations to make the results developed for any specific region comparable with other regional water supply strategies presented in the State Water Plan. The GDS study and the BMP Guide spreadsheet model that was built off of it offer cost benefit analysis for a limited number of common water conservation practices (TWDB & GDS, 2002; TWDB, 2004). However, these models would likely be utilized more by water utilities if they were updated and expanded to something similar to the "Conserve Florida Water Conservation Guide" website (see section 5.3).

4.0 Conservation Business Case Models

Water conservation programs range from structural changes focused on the utility or its customers, to educational or pricing programs designed to influence behavior. Successful conservation programs typically combine such efforts. Conservation best management practices, or BMPs, are readily categorized as structural, operational, rates, or educational. The Texas Water Conservation Implementation Task Force developed a list of municipal, agricultural and industrial BMPs, presented in Attachment D. The following conservation business case models provide examples of these approaches.

4.1 Structural Approach

Structural approaches include those programs which focus on reduced demand through changes in water using equipment or appliances. Two Texas programs, San Antonio and Austin, have commercial and residential programs, small- and large-scale rebates, and outdoor and indoor programs. The City of El Paso offers rebates for toilets and for replacing turf grass with desert landscaping materials. The *Residential End Use Study* published by the AWWA, which included more than 1,100 households in 12 cities, reported toilets accounted for 27.7 percent of domestic water use in the U.S. and approximately 20.1 gallons per capita per day (Mayer et al., 1999). In 2004 SAWS retrofitted 4,525 toilets through its rebate program, saving 1,303 acre-feet per year, at a cost of $256 per acre-foot. The SAWS distribution program retrofitted 4,261 toilets at a savings of 1,227 acre-feet per year, at a cost of $191 per acre-foot (see Attachment B). These local programs are described in more detail in Section 5.1.

4.2 Water Utility Operations Approach

Utilities can improve efficiency by focusing on reduced water losses, good metering, and up-to-date systems operations. In 2003, House Bill (HB) 3338 required more than 4,000 retail water utilities in the state to submit a water system audit report to the TWDB. The water loss audit

divides water losses into two categories — apparent and real. Apparent loss includes meter losses due to under-registering, billing adjustments/waivers that result in unbilled consumption, and unauthorized consumption (theft). Real losses are defined as those occurring from leaks and breaks on mains, valves and service lines, and storage tank overflows.

For example, the 2005 Lubbock water utility audit found 563.7 million gallons in total apparent water loss, or 4.3% of total use. Most of this apparent loss (78 percent) represented consumption adjustments which were not verifiable. Almost all of the rest of the apparent loss represented estimated unregistered flow on large meters. The financial cost of apparent loss was nearly $1 million ($984,000) per year, based on an average retail water cost of $1.75 per thousand gallons. The financial cost to the Utility in 2005 of real losses (leaks, etc.) was $268,000, based on a production cost of $0.84 per thousand gallons.

By analyzing water loss in these two categories, the utility developed a persuasive case for policy makers to authorize increased expenditures on billing system upgrades, to improve operational measures to capture and correct billing errors, and to fund a large meter replacement program, which put an extra meter testing and replacement crew into the field. The utility viewed these improvements not as conservation measures, but as operation efficiency measures implemented to generate additional revenue.

Another example of an effective operational conservation program is the El Paso Water Utilities leak detection program. From 2004 to 2005, El Paso installed 10,000 Permalog (R) leak detection loggers, estimated to now save approximately 700 million gallons of water per year. Permalog detects leaks in water distribution systems. As soon as a leak is detected, the logger transmits a radio signal to indicate a leak condition. Leak characteristics are transmitted to the Patroller, which identifies the approximate location of the logger, and a crew is dispatched to repair the leak. (EPWU, 2006)

4.3 Rates Approach

Many utilities across the country have implemented increasing block rate structures to motivate water conservation. However, results of studies that looked at using price to motivate conservation have been inconclusive or found only small impacts of price on water use (Olmstead, et al, 2003). A study completed in Texas in the late 1990s found a price elasticity of about –0.2 for single family residential customers. This means that for every doubling of price, consumption is reduced by 20 percent (Whitcomb, 1999). In economic terms, this is referred to as inelastic demand, since the reduction in demand is less than 1 percent for every 1 percent increase in price. However, the term “inelastic” does not mean that demand is inflexible or rigid. In fact, the average price of water may be so low compared to average income levels that price is insignificant when measured against the convenience of use. More recent analysis focused on increasing block rates suggests that demand is more elastic than found by earlier studies (Olmstead, et al, 2003) and that the rate structure itself, rather than the marginal price of water, is more important in increasing the elasticity of demand.

Seattle Public Utilities (SPU) calculates a value of water saved through the price elasticity of its water-rate structure. The SPU residential rate structure is an increasing block rate, with three

tiers and a seasonal rate adjustment. The commercial rate structure is flat, with a single price per hundred cubic feet, a variable fee based upon meter size, and a seasonal component. SPU estimated that the conservation resulting from its rate structure, based upon its own elasticity study, is 0.5 MGD out of 2.8 MGD. That is, in 2002, about 18 percent of long-term savings resulted from water conservation (Saving Water Partnership, 2003).

4.4 Education Approach

Changing customer behaviors are an important aspect in reducing municipal water demand. However, water savings and cost effectiveness are difficult to quantify in evaluating public education efforts. Results of the programs are likely to be confounded with the ordinances which they publicize and are hard to separate from the structural changes they promote. Unlike structural or operational approaches, specific measures of gallons-saved-per-commercial-aired or -ad-printed are estimates, at best. Due to changes in demand patterns, however, some general conclusions can be drawn.

From 2002 to 2006, the City of Dallas Water Utilities (DWU), contracted with the firm Enviromedia, to help promote water-awareness and conservation messages in connection with the passage of a new water conservation ordinance. The ordinance restrictions, grass-roots efforts and publicity campaign themed, "Save water. Nothing can replace it," have worked in tandem to save approximately 34 billion gallons over 5 years. The publicity awareness campaign, which included evaluation of public perception as well as actual expenditures, was $15.1 million (this includes added value advertising) over five years. The savings was a combination of the public information efforts, the introduction of increasing block rates, and the ordinance restricting water use outdoors. The estimated cost per acre foot was $144 and the savings per acre foot was $336 (Davis, pers. comm., 2007).

SAWS has tied public awareness and outreach campaigns with their direct rebate programs for about 10 years. During that time, water use in the SAWS service area decreased by an average of 2 gpcd per year, but direct programs could only account for 1 gpcd per year. The rest of that water savings is attributed to behavior change, which is a result of education through these outreach efforts (Guz, 2007)

Finally, North Texas Municipal Water District (NTMWD) and LCRA launched their "Water IQ - Know Your Water" public awareness campaigns in the summer of 2006. Surveys taken after the NTMWD campaign found that 89% of the respondents were more likely to save water after learning about ways to save water and 86% said they conserved more water in 2006 than in 2005. The District saw a 30% water savings due to both the Water IQ campaign as well as mandatory drought restrictions (Hickey, 2007). After a three month campaign, LCRA found that 47% of respondents in the targeted Water IQ market were aware of the Water IQ campaign.

5.0 Local, Regional and State Conservation Program Examples

A number of successful conservation programs at the local, regional and state levels provide case-study examples of financial savings achieved through conservation.

5.1 Local Programs

SAWS offers the largest single water conservation program in the state of Texas, with an annual budget of more than $6 million. Since the mid 1990's water use in San Antonio has remained level at around 180,000 acre-feet per year, although annual population growth has ranged from 1 to 2 percent. The programs target residential, commercial, and industrial customers. Within each class are outdoor and indoor programs. Program examples include free residential water conservation audits, and for commercial customers, SAWS offers rebates for commercial customers who replace high-water-use equipment with a low- or no-water-use process. A commercial cooling tower audit helps customers run their cooling towers efficiently, reducing water and energy costs, as well as extending the life of the cooling tower. A comprehensive list of the 2004 programs and their costs can be found in Attachment B (SAWS, 2005).

The City of Austin was the first municipality in Texas to have commercial and residential water conservation programs. Programs include toilet and clothes washer rebates, irrigation audits, rainwater harvesting rebates, and irrigation system rebates. In 2005, the City of Austin started a program to inform the highest 1,000 residential water users how much they are overwatering by comparing estimated landscape water needs based on evapotransporation (ET), and actual water use. During the peak use month of 2006, 5.5% of city residential customers used over 35,000 gallons per month, and 13% used over 25,000 gallons per month. Evaluation of this program found an average water use reduction of 37.5% in the month following the audit and 19.5% reduction after two months. Austin also has a nationally recognized conservation program targeting the industrial/commercial/institutional sectors (Dewees, 2007).

The City of El Paso focuses much of its effort on ordinance enforcement, school outreach and community education. They conduct an essay contest and produced a widely recognized "Desert Bloom" CD focusing on landscaping appropriate to the West Texas desert. They distribute conservation supplies in "Camel Kits," and games and videos link entertainment to the educational efforts. The El Paso Water Utilities offers a variety of rebate programs for residential and commercial customers. The cost per acre foot saves ranges from a low of $5 for air conditioning cooling clamps to $490 for turf replacement (see Attachment C). A program that is unique within Texas to El Paso is a rebate for customers who exchange their evaporative coolers for air conditioners.

The City of San Marcos is a good example of a small city that is running an effective program with limited resources. Their program includes water audits, school education, public information, enforcement of conservation and drought ordinances, a toilet rebate program, and a clothes washer rebate program. The toilet rebate program has been running since 1995 and costs an average of $268 per ac ft. The washer rebate has been in effect since 2001 and costs an average of $272 per ac ft. (Klein, pers. comm., 2007)

5.2 Regional Programs

In Seattle, WA, a regional consortium known as the Saving Water Partnership has combined the efforts of 26 local water utilities. The partnership's goal, set in 1999, was to reduce per capita water consumption by 1 percent per year through a 10-year water conservation program. Over the last several years the consortium has more than achieved its 1 percent goal. Working together, the utilities gain efficiencies in program delivery and report overall savings. They take advantage of different demographics throughout the region by delivering targeted programs that would not be cost-effective for smaller utilities working alone. According to a 2006 report published by Seattle Public Utilities, the package of conservation measures chosen as most cost effective averaged $426/acft/yr (Seattle Public Utilities, 2006).

The Metropolitan Water District of Southern California (MWDSC) is a cooperative of 26 cities and water agencies serving 18 million people in six counties. Much of its water is imported from the Colorado River and Northern California, therefore, they risk drought in the Colorado River basin and must accommodate the high cost of energy to pump water long distances. Overall reduction in per capita consumption since 1990 is estimated at 35 gallons per person per day. Their conservation programs cost about $250 per ac ft compared to $800 per ac ft for desalination. Their residential programs include toilet and showerhead replacements, and rebates for clothes washers, ET controllers, and rotating stream or precision sprinkler heads. MWDSC also gives an $0.80 per square foot incentive to builders to install higher efficiency sprinklers and irrigation controllers (Lipinski, pers. comm., Ritchie, 2007). The result of these regionally coordinated programs has been to flatten the overall demand curve in southern California so, while population has grown since the late 1980's, the demand today is essentially the same as it was almost two decades ago. Over 10 years the District has invested more than $234 million dollars in conservation activities. In 2005 alone, the District issued about 300,000 rebates for devices that are now saving nearly three billion gallons of water a year in Southern California.

5.3 Statewide Programs

Statewide conservation programs can provide valuable tools that leverage money for public awareness campaigns, and provide technical assistance to enable small utilities with limited resources to conduct more effective conservation programs. An example of technical assistance is creating standardized Best Management Practices and coordinating their implementation using online applications that perform cost/benefit analysis.

The California Urban Water Conservation Council (CUWCC or Council) is a unique and influential non-governmental organization created to increase efficient water use statewide through partnerships and memoranda of understanding among urban municipal water agencies, public interest groups, and private entities. The Council was created in 1991 as a voluntary response to demands from courts that California utilities demonstrate in a verifiable manner that they were achieving real water savings through their conservation programs. The Council's 350 members have agreed to develop and implement 14 comprehensive water conservation BMPs. The Council provides technical resources to assist its members in meeting regulatory requirements to report on water conservation savings and efforts during the five-year period of their state water resource plans. One of the newest of these resources is a guide for performing avoided cost analysis (CUWCC, 2006).

Conserve Florida, housed at the University of Florida in Gainesville, operates a statewide clearinghouse and web application similar to CUWCC, which was created through a joint agreement between the Florida Department of Environmental Protection, the five regional water management districts in the state, and water associations such as the American Water Works Association. Their web-based water conservation guide application allows participating utilities to create a tailored suite of standardized BMPs and evaluate potential water savings based on detailed utility profile inputs. One of the elements in their web-based water conservation guidance document is a minimum set of water conservation practices that is defined and scaled to utility size, with larger utilities expected to implement more practices than smaller utilities (Indelgia, pers. comm.). This is similar to the efforts of the Edwards Aquifer Authority in San Antonio, TX, which requires larger utilities to implement more BMPs than smaller ones.

The Texas Commission on Environmental Quality (TCEQ) and the Texas Water Development Board (TWDB) are the two state agencies involved in statewide municipal conservation programming. The TCEQ accepts and reviews water conservation plans, while the TWDB handles water conservation technical assistance. TWDB’s program currently focuses on reviewing water conservation plans for utilities seeking large water infrastructure loans, distributing water conservation literature and education programs such as Major Rivers statewide, providing technical assistance with such measures as water loss audits and rainwater harvesting, and loaning leak detection equipment.

6.0 Challenges to Successful Implementation

There is a continuum of risk associated with conservation program investment by water suppliers and water utilities. At one end is over-investing, followed by failure to meet demand reduction goals. At the other is the choice to decline to invest in cost-effective long-term conservation

programs, which may then result in unanticipated and, therefore, more costly water supply projects or increased water management costs to reduce per capita water use. Both extremes of risk are addressed here.

The economic means of water customers is related to their average and peak monthly water demand, with more affluent customers using greater amounts of water (Gregg, T, 2006; SAWS, 1993). This is important since these customers are often in new subdivisions with large lots and they end up driving peak summer demands. Increasing block or other types of conservation rates are an attempt to address this issue.

On the other side, conservation efforts that rely too heavily on conservation rates can lead to a type of "rate shock" in which customers reduce water use beyond the level anticipated. Such reductions in demand can lead to revenue shortfalls, prompting the need to increase rates, which usually results in customer dissatisfaction. In order to avoid such negative feedback loops, the process of rate increases needs to include both public education about the need for additional income, public input on the rate structure and level of increase, and investment in conservation to show the public that they are being asked to purchase water efficiently. (Postel, S, 1992)

The existence of conservation programs in neighboring communities also leads to demand for similar programs by a customer's own utility. For example, the demand for conservation programs by LCRA retail water customers is impacted by the existence of programs in Austin, and the expectation that similar programs should be available to themselves. Running regional water conservation programs, or increased coordination of conservation efforts from the state, will help ameliorate the risk of customer dissatisfaction from the perception that some utilities are not "doing enough" compared to their neighbors.

An additional category of risks is regulatory, which include the potential for public water suppliers to have increased compliance costs as TCEQ enforces water conservation and drought planning requirements in the future. Continued exposure to cyclical droughts and the rising number of areas of the state facing water shortages, has led to greater scrutiny of utilities regarding compliance with these rules. Environmental advocates will be able to use the lack of conservation programs as a reason to limit obtaining any additional water supply and expanding water plant capacity. Austin's current controversy over construction of a new water plant is a good example.

The State Water Plan assumes that farming will become more uneconomical in the state, reducing agricultural demand for water and increasing its availability for rising municipal demand. Should this fail to occur, the incentives for municipal conservation would escalate. In fact, if fuel costs rise sufficiently, the economic incentives to grow more food crops locally may reinvigorate farming at the outskirts of large urban areas, although fuel costs also affect irrigated farming by increasing the cost of pumping water.

Energy costs are assumed to increase with time, thus increasing the value of conservation as a means of avoiding costs. If efforts to slow climate change bring carbon taxes or carbon sequestration costs related to pollution control measures, the economic pressure to reduce energy use will increase.

7.0 Conclusions

Successful water programs are a mix of utility operations, structural changes to water use, pricing or financial incentives and education of customers. The scope and limits of conservation efforts are defined by potential water savings and cost. Since conservation planning in Texas is voluntary, adoption at the local decision-making level by a utility, water district or regional water authority should yield the greatest success.

State agencies should increase technical assistance and consistent message development, such as the Water IQ campaign, that communicate to end-users the importance of using water efficiently. In addition, the state should develop new avoided-cost methodologies to assist utilities to properly calculate the costs of water, and assist utilities in preparing for the increased impact of energy costs in the future. These could include the development of web-based tools for estimating water savings and costs, as well as uniform reporting of conservation program results. A mechanism for providing state grants or low-interest loans to utilities could accelerate implementation of conservation measures for long-term water efficiency.

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Attachment A

Municipal Conservation Water Management Strategies and Average Cost in the 2007 State Water Plan

				Average Cost per Acre-foot per year of projected water conserved from 2010-2060					
RWPG[1]	WMS Grouping	Water Management Strategy	Cost per Strategy[2]	2010	2020	2030	2040	2050	2060
A		Conservation Water Management[3]	N/A		$488	$489	$490	$490	$489
B		• Public and School Education • Reduction of Unaccounted for Water through Water Audits • Water Conservation Pricing • Federal Clothes Washer Rules	N/A	$593	$282	$238	$247	$238	$239
C	Basic conservation package[4]	• Public and School Education • Water System Audit, Leak Detection and Repair, Pressure Control • Water Use Reduction due to Increasing Water Prices • Federal Residential Clothes Washer Standards	N/A	$228	$121	$104	$91	$81	$72
C	Municipal Expanded Package[4]	• Water Conservation Pricing Structure • Water Waste Prohibition • Coin-operated clothes washer rebate	N/A	$202	$303	$248	$251	$251	$254

[1] Regional Water Planning Group according to the 2007 State Water Plan
[2] Most regions did not break down costs by strategy. Instead, they presented the cost of "bundled" strategies.
[3] Strategy detail not provided
[4] Cost reported per 1,000 gallons from a table in the Region C Plan. These numbers were converted to acre-feet using 1 acre-foot= 325,851 gallons. The 2007 Water Plan Database averages are different.

		• Residential customer water audit							
D		• Clothes Washer Rebate[5] • Irrigation Audit- High User • Rainwater Harvesting • Rain Barrels	N/A						
E		• Plumbing fixture rebates[6] • Turf replacement rebates • Public education • Enforcement of ordinances • Conservation rate structure	N/A	$136	$137	$152	$166	$175	$171
F		• Public and School Education		$219	$173	$145	$125	$109	$97
F		• Reduction of Unaccounted for Water through Water Audits		$1998	$661	$636	$608	$576	$553
F		• Water Conservation Pricing		0	$654	$329	$331	$331	$329
F		• Federal Clothes Washer Rules		0	0	0	0	0	0
G	Sources: GDS Associates report, TWDB BMP Guide	• Toilet Retrofit[7] • Showerhead and Aerator replacement • Irrigation Audit- High User • Landscape Irrigation BMP • Public Education Programs	N/A	$379	$380	$382	$380	$379	$378
H	Population <3,300	• Unaccounted-for-water	$72 [8]	$154	$154	$154	$154	$154	$154
		• Public Education	$273						
		• Water Wise Program	$118						
H	Population	• 3 strategies listed above[8]		$156	$156	$156	$156	$156	$156

[5] These conservation strategies were evaluated using a TWDB/GDS study on cost quantification for conservation but none were recommended due to cost.
[6] This represents only the City of El Paso's water conservation programs, not a region-wide approach
[7] Region G used the TWDB/GDS study and the TWDB BMP Guide. The average cost per acre foot range listed in the Region G Plan text was $325-$400. The numbers listed per decade are from the 2007 State Water Plan Database.

	3,300-10,000	• Indoor/Exterior Audits	$162						
H	Population >10,000	• 4 strategies listed above[8]		$161	$161	$161	$161	$161	$161
		• Commercial Indoor Audits	$218						
		• Cooling Tower Audits	$144						
		• Pool/Fountain Standards	$43						
		• Pool/Fountain Audits	$83						
		• City of Houston In-House Programs	$5						
I		• Public and School Education[9] • Water Conservation Pricing • Federal Clothes Washer Rules		$430	$299	$255	$187	$155	$131
J		• Water Audit • Public Education	N/A	$477[10]	$463	$454	$454	$442	$439
K	Urban[11]	• Plumbing Fixture Savings	$590	$473[12]	$214	$133	$82	$64	$61
		• Irrigation Savings	$455						
	Suburban	• Plumbing Fixture Savings	$473						
		• Irrigation Savings	$453						
	Rural	• Plumbing fixture savings	$403						

[8] Cost per acre-foot for individual strategies as listed in the Region H plan text. Costs by decade are from the 2007 Water Plan Database.
[9] No cost per acre-foot was listed in the Region I plan text. Costs by decade are from the 2007 Water Plan Database
[10] Cost per acre-foot by decade from the 2007 Water Plan Database for the water audit strategy only, no cost attributed to education. Cost listed in the Region J plan text was $165 per acre-foot
[11] Cost listed in Region K plan text for each strategy bundle are broken into urban, suburban and rural categories. Plumbing fixture savings includes toilet retrofits, showerhead/aerators, and clothes washer rebates. Source: TWDB BMP Guide and TWDB/GDS study
[12] Costs by decade obtained from 2007 Water Plan Database, which averages $0 costs for a decade in which strategies implemented previously are still saving water such as toilet replacements

		• Irrigation Savings	$432						
L	Urban	• Plumbing fixture savings[13]	$458	$552	$496	$482	$480	$484	$490
		• Lawn watering and landscape water conservation	$400						
	Suburban	• Plumbing fixture savings	$520						
		• Lawn watering and landscape water conservation	$400						
	Rural	• Plumbing fixture savings	$588						
		• Lawn watering and landscape water conservation	$400						
M		Municipal Water Conservation	N/A	$112	$112	$112	$112	$112	$112
N		• Public & School Education • Residential Clothes Washer Installation	$323-$342[14]	0	0	0	0	0	0
O	Urban	• Plumbing fixture savings	$520	$526	$469	$457	$438	$420	$418
		• Lawn watering and landscape water conservation	$400						
	Suburban	• Plumbing fixture savings	$542						
		• Lawn watering and landscape water conservation	$400						
	Rural	• Plumbing fixture savings	$561						
		• Lawn watering and landscape water conservation	$400						
P		No Municipal Water Conservation Strategies Selected							

[13] Cost listed in Region L plan text for each strategy bundle broken into urban, suburban and rural categories. Source: TWDB/GDS study
[14] No costs listed in the 2007 Water Plan Database. This cost per acft comes from a table in the Region N plan, which is not explained in detail in the text.

Attachment B

San Antonio Water System Conservation Measures
Water Savings and Costs 2004

Program Name	FY 2004 Expenses	2004 Units	2004 Water Saved (ac-ft)	2004 Unit Cost ($/ac-ft)
Plumbers to People	$189,254	505	456	$415
Kick the Can Rebate	$334,650	4,525	1,303	$256
Kick the Can Distribution	$234,355	4,261	1,227	$191
WashRight Rebate	$219,400	2,194	360	$594
Watersaver Landscape	$42,495	104	86	$494
Residential Hot Water on Demand	$7,950	53	17	$468
Residential Rain Sensor	$839	17	21	$40
Irrigation System Analysis	$8,568	119	49	$175
Large Scale Audit/Retrofit Program	$15,923	6	225	$71
Commercial Toilet Rebate Program	$93,150	1,242	358	$260
Commercial Toilet Distribution (Industrial)	$322,920	2,691	1,167	$276
Commercial Toilet Distribution (Basic)	$470,701	6,113	1,957	$241
Non-profit Distribution and Installation (Housing)	$189,576	1,469	423	$448
Non-profit Distribution and Installation (Schools)	$402,085	1,744	1,008	$399
Restaurant Toilet Installation	$135,960	618	751	$220
Restaurant Certification	$262,280	1,660	3,575	$73
Commercial Rain Sensor	$3,395	43	212	$16
Annual Totals	$2,933,501		13,195	$222

Attachment C

El Paso Water Utilities
Conservation Measures Cost Benefit Analysis

Program Name	Unit Cost ($/ac-ft)
Air Conditioner Clamps	$5
Showerheads	$9
Waterless Urinals	$275
Commercial Washing Machines	$295
Refrigerated Air Rebate	$316
Ultra Low Flow Toilet Rebate	$405
Residential Washing Machine Rebate	$455
Turf Rebate	$490

Attachment D

SB 1094 Water Conservation Implementation Task Force Recommended Best Management Practices

Municipal BMPs

Structural

Metering of New Accounts and Retrofit of Existing Accounts
Showerhead Aerator Plumbing and Toilet Flapper Retrofits
Residential Clothes Washer Replacement
Water Wise Landscape Design and Conversion Programs
Rainwater Harvesting and Condensate Reuse
Reuse of Treated Effluent
New Construction Graywater Systems
Residential ULFT Replacement Programs
Conservation Programs for Industrial, Commercial and Institutional Accounts

Operational

System Water and Water Loss Audits
Water Surveys for Single-Family and Multi-Family Customers
Golf Course Conservation
Wholesale Agency Assistance Programs
Water Conservation Coordinators
Water Waste Prohibition
Conservation Programs for Industrial, Commercial, and Institutional Accounts
Park Conservation
Athletic Field Conservation

Economic

System Water Audit and Water Loss
Residential ULFT Replacement Programs
Rainwater Harvesting and Condensate Reuse
Water Conservation Pricing
Wholesale Agency Assistance Programs
Conservation Programs for Industrial, Commercial, and Institutional Accounts

Education

School Education
Water Wise Landscape Design and Conversion Programs
Public Information BMPs

Agricultural BMPs

Structural

Surge Flow Irrigation For Field Water Distribution Systems
Replacement Of Irrigation District Canals And Lateral Canals With Pipelines
On-Farm Water Delivery Systems
Replacement Of Irrigation District Canals And Lateral Canals With Pipelines
Linear Move Sprinkler Irrigation Systems
Lining of District Irrigation Canals
Tailwater Recovery and Reuse Systems
Conversion Of Supplemental Irrigated Farmland To Dry-Land Farmland
Volumetric Measurement of Irrigation Water Use
Lining of On-Farm Irrigation Ditches
Low Pressure Center Pivot Sprinkler Irrigation Systems
Drip/Micro-Irrigation System
Gated and Flexible Pipe for Field Water Distribution Systems

Operational

On-Farming Irrigation Audits

Crop Residue Management and Conservation Tillage

Land Leveling

Irrigation Scheduling

Contour Farming

Furrow Dikes

Nursery Production Systems

Industrial BMPs

Structural

Boiler and Steam Systems

Industrial Submetering

Refrigeration (including chilled water)

Cooling Towers

Industrial Alternative Sources and Reuse of Process Water

Cooling Systems (other than Cooling Towers)

Industrial Landscape

Once-through Cooling

Rinsing/Cleaning

Water Treatment

Operational

Industrial Water Audit

Industrial Water-Waste Reduction Management and Employee Programs

Industrial Site-Specific Conservation Programs

Industrial Landscape

Cooling Towers and Cooling Systems

Rinsing/Cleaning

Water Treatment

Educational

Management and Employee Programs

Attachment 7

Conveyance and Distribution Capital Projects Avoided or Deferred Regionally Due to Demand Management Programs

2016 Cost of Service:

"Demand Management Programs reduce the use of and burden on Metropolitan's distribution and conveyance system, which, in turn, helps reduce the capital, operating, maintenance and improvement costs associated with these facilities. For example, local water resource development and conservation has deferred the need to build additional infrastructure such as the Central Pool Augmentation Project tunnel and pipeline, completion of San Diego Pipeline No. 6, the West Valley Interconnection, and the completion of the SWP East Branch expansion. Overall, the decrease in demand resulting from these projects is estimated to defer the need for projects between four and twenty-five years at a savings of approximately $2.7 billion in 2015 dollars. The programs also free up capacity in Metropolitan's system to convey both Metropolitan water, and water from other non-MWD sources."[1]

Details of the calculation methodology to calculate project costs in 2015 dollars:

In order to identify the value of avoided or deferred projects in 2015 dollars, a cost estimate of identified projects was obtained from Metropolitan Engineering staff. The estimated costs were made at various times through the Capital Investment Plan (CIP) development process. In order to estimate the value in 2015 dollars, the projects were organized and the program estimate and date identified. To escalate the dollars, an index of construction costs increases prepared by Engineering News Record (ENR) was used.

Metropolitan's CIP cost estimates are prepared by fiscal year. The appropriate ENR index for June of each fiscal year end was located. The ENR index for July 2015 was also located. The cost increase from June of each budget fiscal year to July 2015 was calculated as follows:

1. Calculate escalation value: (July 2015 – June of fiscal year for cost estimate) / June of fiscal year estimate

2. Add escalation value to the number 1 (for example, 1+ .7932821) and multiply by the original project estimate to derive the 2015 project estimate cost

The individual escalated 2015 cost estimates for identified Metropolitan CIP projects and the State Water Project East Branch expansion project were summed to arrive at approximately $2.7 billion ($2,682,754,594) in 2015 dollars for the value of avoided or deferred capital projects due to Demand Management Programs.

Example:

West Valley Project, $266,298,000 as of FY 1995/96 (June 1996)
ENR index, June 1996 = 5597
ENR index, July 2015 = 10037
(10037 – 5597) = 4440
4440 / 5597 = .7932821
$266,298,000 x (1+.7932821) = $477,547,441

The estimated cost of the West Valley Project in 2015 dollars, based on a cost estimate of $266,298,000 as of FY 1995/96, is $477,547,441.

Back-up documentation attached

[1] Metropolitan Water District of Southern California, "Fiscal Years 2016/17 and 2017/18 Cost of Service for Proposed Water Rates and Charges", April 2016, page 47.

2015 Dollars of Avoided or Deferred Conveyance and Distribution Projects Due to Demand Management Programs

Program No.	Appn. Name	Total Program Estimate	Completed features	FY Budget (cost estimate)	ENR Start Period	ENR July 2015	Cost Escalation	Project Estimate 2015 dollars	Comments
5-0229-21	West Valley Project	266,298,000		1995/96	5597	10037	0.7932821	477,547,441	
5-0141-21	Central Pool Augmentation Tunnel & Pipeline	750,460,000		1996/97	5860	10037	0.7127986	1,285,386,863	
5-5560-71	Central Pool Augmentation and Water Quality Project - Study and Land	41,309,000		1996/97	5860	10037	0.7127986	70,753,999	
15428	Second Lower Cross Feeder	52,796,722		2005/06	7700	10037	0.3035065	68,820,870	
5-5580-21 (15121)	San Diego Pipeline No. 6	472,302,000	117,913,800	2010/11	9053	10037	0.1086933	405,724,239.77	
						Total MWD		2,308,233,413	
	SWP East Branch Expansion, completion	371,601,356		2007	7967	10037	0.2598218	374,521,181	80% cost responsibility
						Total All		2,682,754,594	

MWD

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

CAPITAL PROGRAM

For Fiscal Year 1995/96

CAPITAL PROGRAM
FISCAL YEAR 1995-96
DEFERRED / CANCELLED PROGRAMS

CIP PAGE	PROGRAM TITLE	PROGRAM NO.	PROGRAM ESTIMATE
	Programs Deferred Beyond Fiscal Year 1996-97 (Cont'd)		
F-1	West Valley Project	5-0229-21	266,298,000
F-2	Perris Filtration Plant	5-0516-31	402,639,100
F-3	Central Pool Augmentation Filtration Plant	5-0221-32	392,027,800
		Total	$1,624,764,900
	Cancelled Programs		
-	Interconnection Of Lakeview Pipeline	5-0144-11	13,262,900
-	* Imperial Irrigation District/Metropolitan Water District Conservation Program, Phase II	5-0230-11	153,113,700
-	* Imperial Irrigation District/Metropolitan Water District Test Land Fallowing Program	5-0403-11	30,000,000
-	* Imperial Irrigation District/Metropolitan Water District Conservation Program, Phase I	5-5920-11	109,060,500
-	* Main San Gabriel Basin Groundwater Storage Program	5-6370-11	578,943,700
-	* Coachella Canal Lining Project	5-6470-11	126,000
-	* Demonstration Program on Interstate Underground Storage of Colorado River Water	5-6520-11	8,000,000
-	* All American Canal Lining Project	5-6870-11	123,506,000
-	Lake Mathews - Sewer Connection To Western Municipal	5-0211-12	636,200
-	Los Angeles Headquarters - Seismic Modifications	5-5880-61	5,209,700
-	L. A. Headquarters Building - Fire Sprinkler System	5-6200-61	3,970,200
-	Soto Street Operations and Maintenance Center Replacement	5-5510-63	7,100,600
		Total	$1,032,929,500

* Note: While these projects have been postponed indefinitely for consideration, there are opportunities that Metropolitan will continue to review and, should the need arise, these projects will once again be pursued.

MWD

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

CAPITAL PROGRAM

For Fiscal Year 1996/97

CAPITAL PROGRAM
FISCAL YEAR 1996-97
DEFERRED PROJECTS

	PROGRAM TITLE	PROGRAM NO.	PROGRAM ESTIMATE
Def-1	Central Pool Augmentation Tunnel and Pipeline	5-0141-21	750,460,000
Def-2	West Valley Project	5-0229-21	8,470,200
Def-3	Allen McColloch Pipeline Parallel	5-0507-21	74,798,700
Def-4	Skinner Filtration Plant - Install Effluent Adjustable Weir Slide Gates	5-0304-31	830,000
Def-5	Skinner Filtration Plant - Modules 4,5 and 6 Sedimentation Basins	5-0410-31	47,038,200
Def-6	Skinner Filtration Plant Monofill	5-6510-31	2,091,600
Def-7	Central Pool Augmentation Filtration Plant	5-0221-32	497,377,000
Def-8	Lake Mathews Auto and Heavy Equipment Shop.	5-0408-61	5,000,000
Def-9	La Verne Construct Office and Warehouse Storage	5-0001-63	4,897,000
Def-10	Weymouth Replace Existing Asphalt Paving	5-0002-63	1,201,300
Def-11	La Verne Facilities - Construct a Utility Shop Building	5-0112-63	9,635,000
Def-12	Warehouse and Storage Building At Mills Filtration Plant	5-0402-63	2,700,000
Def-13	Lake Mathews Multi-Purpose Building	5-0404-63	1,265,900
Def-14	Perris Filtration Plant - Study and Advance Land Acquisition	5-5800-71	35,881,600
Def-15	San Bernadino/Riverside Area Study	5-5810-71	2,512,900
Def-16	West Valley Area Study	5-5990-71	3,362,600
		TOTAL	1,447,522,000

CAPITAL PROGRAM

Program Central Pool Augmentation and Water Quality Project - Study and Land Acquisition **Program No** 5-5560-71

Scope Feasibility study, environmental documentation, and early acquisition of critically needed lands for implementation of a new treatment plant at Lake Mathews and an 18-mile tunnel and pipeline conveyance system to the existing distribution system in Orange County. The project is needed to meet increasing demand for treated water in the Central Pool, improve water quality in compliance with anticipated water quality regulations, strengthen system reliability, and make water system operations more reliable. The project would also provide treated water service to Western Riverside County.

Accomplishments Through 1995-1996

Completion of the final EIR and associated planning documents. Acquisition of the Eagle Valley Water treatment plant site near Lake Mathews and the pipeline, tunnel and access road rights-of way to the site were also completed.

Objectives For 1996-97

Complete right-of-way studies and appraisals for key tunnel portal sites and other key project sites under threat of development in Temescal Canyon. Completion of studies and appraisals for sites in Orange County that will be converted to mitigation land on the Orange County NCCP. Pending Board approval and funding, acquisition of certain needed project lands is anticipated and necessary to preserve right-of-way and project viability . Completion of additional environmental documentation for Federal project approvals. Litigation is also anticipated in response to lawsuit on CEQA issues.

EXPENSE DETAIL	Program Estimate (A)	Projected Cost Thru June 30, 1996 (B)	Budget Estimate 1996-97 (C)	BALANCE A-(B+C)	Fiscal Year 1995-96	
					Budget	Projected
Labor and Additives	817,900	555,300	74,800	187,800	80,200	99,800
Materials and Supplies	8,400	8,400				
Incidental Expenses	176,800	123,400	42,400	11,000	63,000	25,200
Professional Services	3,798,300	3,491,100	263,000	44,100	498,800	166,100
Land Purchase	36,041,200	16,546,900	13,829,000	5,665,300	10,500,000	3,460,000
Usage of Operating Equipment	400	400				100
Administrative Charges	415,900	282,600	29,700	103,600	37,800	54,600
Contract Payments	50,000	50,000				
Contingency	100			100		
TOTAL	41,309,000	21,058,100	14,238,900	6,011,900	11,179,800	3,805,800

MWD
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

ORANGE COUNTY CROSS FEEDER
PRELIMINARY DESIGN REPORT
(12/20/2005)

ORANGE COUNTY CROSS FEEDER
APPROPRIATION NO. _____

Submitted by: _____ Date: _____
Project Manager – Sergio Escalante

Approved by: _____ Date: _____
Project Engineer – Bert Bukirin

Approved by: _____ Date: _____
ROW Engineering – Pete Wiseman

Approved by: _____ Date: _____
Field Survey – Julio Castillo

Approved by: _____ Date: _____
Acquisition and Appraisal – Guy Walters

Approved by: _____ Date: _____
Construction Inspection – Paul Weston

Approved by: _____ Date: _____
Environmental Planning – Anthony Klecha

2nd Lower Shutdown (2nd lower tie-in)	October 2007	
As-Built	April 2008	June 2008

*End of month

1.6.2 Budget

The estimated budget cost for the project is as follows:

1. Owners Cost Estimate.....$800,000*
2. Study/Preliminary Design Cost Estimate.....$237,000
3. Final Design Cost Estimate.....$1,573,000
4. Right-of-way.....$5,500,000*
5. 84" Butterfly Valves.....$1,350,000
6. Construction Management Cost Estimate $2,581,499*
7. Construction Cost Estimate.....$33,868,694*
   (see Section 4.4 for details)
8. Contingency Cost Estimate.....$6,886,529
9. Total Project Cost Estimate $52,796,722*

* Projected/Estimated Cost

2.0 PROJECT STUDIES

2.1 Alternative Alignment Studies – See Section 4.4

2.2 Hydraulic and Surge Analysis

The Orange County Cross Feeder (OCCF) can distribute water in two directions; from West to East and from East to West. For operational information and the purpose of flowing water from West to East or West to East, see the Waster System Operations section of this report.

The OCCF will connect the East Orange County Feeder No. 2 (EOCF #2) and the Second Lower Feeder (2LF). Since the EOCF#2 is designed for a hydrostatic grade of 810-feet, and the 2LF is designed for a hydrostatic grade of 660-feet, pressure relief valves are needed to prevent the 2LF from inadvertently being over pressurized.

2.2.1 Flow for West to East

Flowing water from West to East requires a Pressure Control Structure (PCS) to control water flows and break head into the lower pressure section of the 2LF. The EOCF #2 is designed for a maximum hydrostatic grade of 810-feet. The 2LF at the location where the OCCF is connecting is designed for a maximum hydrostatic grade of 660-feet. Therefore, during a normal operation of flowing water from the EOCF # 2 (with either Diemer of future CPA as the water source) across the OCCF to the 2LF, a PCS is required to reduce the pressure and control flow. This PCS will be able to control the flow rate to a desired amount and ensure the pressure in the 2LF will not exceed a

2010/11 BUDGET

THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA






San Diego Pipeline No. 6 — 15121

Total Program Estimate:	$472,302,000	**Total Projected Through June 30, 2010:**	$105,281,000
Appropriated Amount:	$117,914,000	**Estimated Percent Complete:**	22%
FY 2010/11 Estimate:	$171,000	**Estimated Completion Date:**	2026-2027

Scope

The San Diego Pipeline No. 6 Program, a joint project between Metropolitan and the SDCWA, includes the construction of a 30-mile, nine to ten-foot diameter pipeline and tunnel conveyance system to meet supplemental water needs in southern Riverside and San Diego Counties. The current total program estimate only includes costs for the portion in Riverside County.

Purpose

To provide raw water for municipal, industrial, and agricultural users in southern Riverside and San Diego counties, and to increase system reliability and operational flexibility.

Accomplishments Through FY 2009/10

In Oct 2002, the Board authorized staff to proceed with design and land acquisition for the north reach of San Diego Pipeline 6. By June 2004, the supplemental EIR had been approved. The construction of the North Reach was successfully completed and the Notice of Completion was issued on January 26, 2007. In March 2006 the Board authorized staff to conduct feasibility investigations of alternative alignments in order to determine the most cost-effective project corridor for the remaining portions of Pipeline 6. In February 2007, the Board authorized staff to enter into agreement with Jacobs Associates to conduct geological, geotechnical, and hydrogeological investigations, and tunnel engineering feasibility analyses and cost estimates. It is anticipated that the final feasibility report, including San Diego's portion, will be presented to the Board in early 2010. A request to the Board to authorize funding to proceed with final aerial surveys, preliminary design, CEQA, and securing right of way entry permits, for the recommended alignment is planned for 2010.

Objectives For FY 2010/11

Continue remaining mitigation and monitoring measures associated with the supplemental EIR and permits along the completed North Reach.

DEPARTMENTAL BUDGET

FISCAL YEARS 2012/13 AND 2013/14

San Diego Pipeline No. 6 — 15121

Total Program Estimate:	$117,913,800	**Total Projected Through June 30, 2012:**	$105,646,600
Appropriated Amount:	$117,913,800	**Estimated Percent Complete:**	100%
Biennial Estimate:	$69,200	**Estimated Completion Date:**	2013-2014

Scope

This program was established as a joint project between Metropolitan and the San Diego County Water Authority, includes the construction of a 30-mile, nine to ten-foot diameter pipeline and tunnel conveyance system to meet supplemental water needs in southern Riverside and San Diego Counties. The construction of the North Reach was successfully completed and the Notice of Completion was issued on January 26, 2007. The current total program estimate only includes costs for the portion in Riverside County.

Purpose

To provide raw water for municipal, industrial, and agricultural users in southern Riverside and San Diego counties, and to increase system reliability and operational flexibility.

Accomplishments Through FY 2011/12

Through FY 2011/12, one project has been completed.

Major project milestones in FY 2011/12:

North Reach Environmental Monitoring – Continued monitoring in compliance with the Mitigation/Monitoring Plan

The South Reach portions have been deferred

Objectives for 2012/13 – 2013/14

North Reach Environmental Monitoring – Complete monitoring

East Branch Enlargement - Phase II

Table 8-1 Summary of Scenario Costs

					Scenario 1 DWR 2004 Report Conditions (Bases Case Water Surface Elevations)			Scenario 2 Canal Raise Alternative			Scenario 3 Smooth Siphon Alternative		
	Item	Unit	2007 Unit Cost (a)	Estimated Lifecycle	Quantity	2007 Construction Costs	Annualized Cost with Contingency	Quantity	Costs	Annualized Cost with Contingency	Quantity	Costs	Annualized Cost with Contingency
B & D	**Canal**												
1	Mobilization and Demobilzation4	EA	$ 0	50	1	$ 12,774,000	$ 823,498	1	$ 12,426,104	$ 801,070	1	$ 11,801,550	$ 760,807
2	Raise Embankment3	CY	23	100	4,198,686	96,569,767	5,698,144	3,540,274	81,426,291	4,804,597	2,304,919	53,013,128	3,128,064
3	Compacted Embankment	CY	33	100	292,008	9,636,269	568,593	246,217	8,125,168	479,429	160,301	5,289,945	312,136
4	Raise Concrete Lining	CY	400	50	37,397	14,958,640	964,335	33,485	13,393,804	863,455	26,597	10,638,945	685,858
6.5	Remove and Replace Primary Road	FT	60	15	485,496	28,918,929	3,315,150	309,038	18,408,101	2,110,231	167,746	9,991,891	1,145,430
7	Add One Bay Check Structures1	EA	908,072	50	16	14,529,147	936,647	23	20,885,649	1,346,430	23	20,885,649	1,346,430
8	Add Single Barrel Siphon1	EA	3,178,492	50	8	25,427,935	1,639,256	8	25,427,935	1,639,256	8	25,427,935	1,639,256
8.1	Add Single Barrel Siphon (Tejon)	EA	2,022,677	50	1	2,022,677	130,395	1	2,022,677	130,395	1	2,022,677	130,395
8.2	Add Single Barrel Siphon (Antelope)	EA	13,002,921	50	1	13,002,921	838,256	1	13,002,921	838,256	1	13,002,921	838,256
9	Add Three R.C. Box Siphon1	LF	3,756	50	555	2,084,802	134,400	555	2,084,802	134,400	555	2,084,802	134,400
10	New Radial Gates and Radial Gate Hoists1	EA	211,883	25	16	3,390,134	285,040	23	4,873,318	409,746	23	4,873,318	409,746
11	Modify Existing Radial Gate and Check1	EA	15,135	50	41	620,516	40,003	41	620,516	40,003	41	620,516	40,003
12	Remove Raised Concrete Sill at Check1	EA	12,108	50	54	653,812	42,149	54	653,812	42,149	54	653,812	42,149
13	Modify Existing Radial Gate Hoist and Electrical1	EA	75,673	25	41	3,102,578	260,863	41	3,102,578	260,863	41	3,102,578	260,863
14	Bridges2	EA	655,876	75	33	21,643,908	1,302,854	31	20,332,156	1,223,894	20	13,117,520	789,609
15	Overchutes1	EA	20,000	50	71	1,420,000	91,543	71	1,420,000	91,543	67	1,340,000	86,385
16	Raise Pipelines1	EA	126,450	50	12	1,517,405	97,822	12	1,517,405	97,822	12	1,517,405	97,822
17	Raise 121" Steel Pipeline1	LS	224,801	50	1	224,801	14,492	1	224,801	14,492	1	224,801	14,492
18	Extend Culvert Inlets and Outlets1	EA	121,076	30	106	12,834,080	987,620	67	8,169,426	628,662	37	4,434,353	341,237
19	Hydromulching1	AC	9,178	20	100	917,803	87,442	64	584,220	55,660	35	317,114	30,212
20	Traffic Control and Detour1	LS	2,003,869	50	1	2,003,869	129,183	1	2,003,869	129,183	1	2,003,869	129,183
21	Slip Form Wall LF	LF	84	50	-	-	-	21,595	1,813,997	116,942	18,110	1,521,274	98,072
23	Precast Panel System LF	LF	119	30			-	154,862	18,428,626	1,418,137	291,773	34,720,963	2,671,881
24	Smooth Coating for Siphons SF	SF	14	15	-	-	-	-	-	-	1,801,827	25,225,584	2,891,760
C	**Pearblossom Pumping Plant**												
1	Furnish and install pump units1	EA	6,276,793	25	2	12,553,585	1,055,498	2	12,553,585	1,055,498	2	12,553,585	1,055,498
2	Furnish and install motors1	EA	5,803,598	25	2	11,607,195	975,926	2	11,607,195	975,926	2	11,607,195	975,926
3	Furnish and install valves1	EA	2,045,589	50	2	4,091,179	263,745	2	4,091,179	263,745	2	4,091,179	263,745
4	Install 11'-0" discharge line1	JOB	13,161,846	50	1	13,161,846	848,501	1	13,161,846	848,501	1	13,161,846	848,501
	Discount Rate: 4.875%				Subtotal	$ 309,667,797	$ 21,531,356	Subtotal	$ 302,361,980	$ 20,820,285	Subtotal	$ 289,246,353	$ 21,168,116
	Contingency: 20%					$ 61,933,559			$ 60,472,396			$ 57,849,271	
	Project Lifecycle (Years): 50					**$ 371,601,356**			**$ 362,834,375**			**$ 347,095,623**	
						Present Value: $400,000,000			**Present Value: $390,000,000**			**Present Value: $390,000,000**	

Notes:

1 Unit Cost is escalated from the DWR East Branch Enlargement Report Costs for 2001.
2 Bridge cost is the average between the cost of replacing and raising the bridge.
3 Updated embankment quantity from DWR
4 Mobilization and Demobilization cost excludes C Pearblossom Pumping Plant.
5 Design, Environmental and Right of Way costs are not included

ENR
Engineering News-Record

Construction Cost Index History - As of October 2015

HOW ENR BUILDS THE INDEX: 200 hours of common labor at the 20-city average of common labor rates, plus 25 cwt of standard structural steel shapes at the mill price prior to 1996 and the fabricated 20-city price from 1996, plus 1.128 tons of portland cement at the 20-city price, plus 1,088 board ft of 2 x 4 lumber at the 20-city price.

View the ANNUAL AVERAGE For ENR'S CONSTRUCTION COST INDEX.

ENR'S CONSTRUCTION COST INDEX HISTORY (1908-2015)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG.
2015	9972	9962	9972	9992	9979	10039	10037	10039	10065	10128	10092		
2014	9664	9681	9702	9750	9796	9800	9835	9846	9870	9886	9912	9936	9806
2013	9437	9453	9456	9484	9516	9542	9552	9545	9552	9689	9666	9668	9547
2012	9176	9198	9268	9273	9290	9291	9324	9351	9341	9376	9398	9412	9308
2011	8938	8998	9011	9027	9035	9053	9080	9088	9116	9147	9173	9172	9070
2010	8660	8672	8671	8677	8761	8805	8844	8837	8836	8921	8951	8952	8799
2009	8549	8533	8534	8528	8574	8578	8566	8564	8586	8596	8592	8641	8570
2008	8090	8094	8109	8112	8141	8185	8293	8362	8557	8623	8602	8551	8310
2007	7880	7880	7856	7865	7942	7939	7959	8007	8050	8045	8092	8089	7966
2006	7660	7689	7692	7695	7691	7700	7721	7722	7763	7883	7911	7888	7751
2005	7297	7298	7309	7355	7398	7415	7422	7479	7540	7563	7630	7647	7446
2004	6825	6862	6957	7017	7065	7109	7126	7188	7298	7314	7312	7308	7115
2003	6581	6640	6627	6635	6642	6694	6695	6733	6741	6771	6794	6782	6694
2002	6462	6462	6502	6480	6512	6532	6605	6592	6589	6579	6578	6563	6538
2001	6281	6272	6279	6286	6288	6318	6404	6389	6391	6397	6410	6390	6343

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG.
2000	6130	6160	6202	6201	6233	6238	6225	6233	6224	6259	6266	6283	6221
1999	6000	5992	5986	6008	6006	6039	6076	6091	6128	6134	6127	6127	6059
1998	5852	5874	5875	5883	5881	5895	5921	5929	5963	5986	5995	5991	5920
1997	5765	5769	5759	5799	5837	5860	5863	5854	5851	5848	5838	5858	5826
1996	5523	5532	5537	5550	5572	5597	5617	5652	5683	5719	5740	5744	5620
1995	5443	5444	5435	5432	5433	5432	5484	5506	5491	5511	5519	5524	5471
1994	5336	5371	5381	5405	5405	5408	5409	5424	5437	5437	5439	5439	5408
1993	5071	5070	5106	5167	5262	5260	5252	5230	5255	5264	5278	5310	5210
1992	4888	4884	4927	4946	4965	4973	4992	5032	5042	5052	5058	5059	4985
1991	4777	4773	4772	4766	4801	4818	4854	4892	4891	4892	4896	4889	4835
1990	4680	4685	4691	4693	4707	4732	4734	4752	4774	4771	4787	4777	4732

Attachment 8

No. A146901

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA
FIRST APPELLATE DISTRICT, DIVISION THREE

SAN DIEGO COUNTY WATER AUTHORITY,
Respondent and Cross-Appellant,
v.
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA,
Appellant and Cross-Respondent.

Appeal From Judgments And Peremptory Writs of Mandate After Court Trials
Superior Court for the County of San Francisco, Nos. CFP-10-510830 and CFP-12-512466
The Honorable Richard A. Kramer and Curtis E.A. Karnow

APPELLANTS' OPENING BRIEF

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obligations" that would include the State Water Project conveyance system].) Of course, Metropolitan has *one* conveyance system; it does not have one conveyance system for full-service water purchasers and one conveyance system for wheelers. There is no question under *Imperial* that, as part of its entitlement to "fair compensation" for wheeling, Metropolitan can require wheelers to contribute to the "reasonable capital, maintenance, and operation costs occasioned, caused, or brought about by 'the use of the conveyance system" (*Imperial*, *supra*, 80 Cal.App.4th 1403, 1431; *accord* 27-AA-07507), or that Metropolitan is not required to apportion those costs to wheelers based only on segments of the system wheelers most often use (*Imperial*, *supra*, at pp. 1433-34).

Metropolitan's decision to allocate its State Water Project transportation costs to Transportation Rates and its wheeling rate thus was reasonable on the record and consistent with both *Goodman* and *Imperial*. The superior court erred in holding otherwise.

4. Metropolitan's Allocation Of The Water Stewardship Rate To Transportation Should Be Upheld As Reasonable

The superior court recognized that demand-management programs benefit wheelers by reducing transportation capacity needs, but held nevertheless that Metropolitan may not allocate the Water Stewardship Rate that recovers those costs to transportation. (27-AA-07511-12.) Specifically, the court held that Metropolitan did

not "show correlation between Met[ropolitan]'s avoided transportation costs and [the Water Stewardship Rate.]" (27-AA-07511.) That is error.

(a) The Water Stewardship Rate Recoups Costs Of Programs That Benefit All Users of Metropolitan's System, Including Wheelers

Metropolitan's Water Stewardship Rate recovers the costs of funding demand-management programs that further Metropolitan's legislative mandate to expand and incentivize the development of local water supplies and water conservation within its service area. Those programs include the Local Resources Program, which provides incentives for recycled water and groundwater recovery facilities, and the Conservation Credits Program, through which Metropolitan encourages installation of water-efficient devices and other conservation measures. (Wat. Code appen., § 109-130.5; Wat. Code, §§ 10608.16, 10608.36; *see also* 24-AR2010-006519-20; 31-RT-1772:4-1773:10; 40-AR2010-011492; 11-AR2010-002868-73; 58-AR2012-016495-6; 58-AR2012-016519.) As a Transportation Rate, the Water Stewardship Rate is charged to *both* full-service water purchasers and wheelers per acre-foot of water purchased or wheeled. As established by the administrative record (and further supported by evidence adduced at trial), Metropolitan's allocation of the Water Stewardship Rate to transportation is reasonable because the demand-management programs it funds create several

transportation-related benefits. (*See, e.g.*, 28-RT-1356:18-24, 1360:11-13.)

First, demand-management programs enable Metropolitan to avoid, reduce, or defer transportation-related capital expenditures. (*See, e.g.,* 40-AR2010-011511 ["Investments in demand side management programs like conservation, water recycling and groundwater recovery…help defer the need for additional conveyance, distribution, and storage facilities"].) The lower the regional demand for water, the less Metropolitan needs to spend on capital costs to expand and maintain its conveyance and distribution network.

This conclusion is amply supported by the record. In 1996, Metropolitan conducted an extensive study to determine its future demand scenarios and corresponding infrastructure requirements. (*See generally* 6-AR2010-001406-1519; 6-AR2010-001520-1657; 9-AA-02335-62; 10-AA-02708-2821; 9-AA-02363-501.) Specifically, Metropolitan compared a "base case" without demand-management programs to a "preferred case" with such programs. (9-AA-02343-45, 02348-53; 31-RT-1774:13-1755:24.) Under the base case, Metropolitan identified several distribution facilities for which it would need to incur capital costs to create or expand, including the

Central Pool Augmentation Project, San Diego Pipeline No. 6, and the West Valley Interconnection. (*See* 9-AA-02345; 31-RT-1776:1-21; *see also* 6-AR2010-001652-001657.)[18] Metropolitan determined that the preferred case with demand-management programs would save approximately $2 billion in capital infrastructure costs. (9-AA-02353; 31-RT-1776:22-1777:12.)

Also, as part of its 1996 Integrated Resources Plan (*see generally* 6-AR2010-001520-1657), Metropolitan assessed how changes in future demand would affect the need for additional or expanded distribution facilities. (6-AR2010-001655-001657; 31-RT-1779:25-1780:10.) The analysis revealed that as little as a 5% increase or decrease in demand had a significant effect on projected infrastructure capital costs. (6-AR2010-001655-57; 31-RT-1779:25-1781:16.) For example, Metropolitan determined that if anticipated demand decreased by 5%, it could defer building the San Diego Pipeline No. 6 and the Central Pool Augmentation Project, both of which are distribution facilities. (6-AR2010-001655-57; 31-RT-1781:6-16.) Metropolitan has in fact been able to defer both those

---

[18] As the largest purchaser of Metropolitan's water, San Diego would pay the highest percentage of these capital costs, which are recouped in the volumetric System Access Rate. (*See* 40-AR2010-011492; 59-AR2012-016697; 29-RT-1553:21-22.)

infrastructure projects because demand-management programs have effectively decreased demand on its distribution system. (31-RT-1781:17-1782:3.)

As these studies demonstrate, Metropolitan's ability to defer or avoid capital expenditures is directly related to reducing demand on its distribution system. (24-AR2010-006519 ("Investments in conservation and recycling decrease the region's overall dependence on imported water supplies"); 31-RT-1796:24-1797:1); 11-AR2010-002870 [first key goal of Metropolitan's Local Resources Program is to "avoid or defer [Metropolitan] capital expenditures"]; 31-RT-1786:22-1788:11; 10-AA-02564 [identifying regional benefits associated with the Local Resources Program, including reduction in capital investments due to deferral and downsizing of regional infrastructure and reduction in operating costs for distribution of imported supplies); 31-RT-1788:17-1789:21; 31-RT-1791:16-1793:1.)[19]

Even San Diego has acknowledged the regional, transportation-related benefits of Metropolitan's demand-

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[19] The reduced demand resulting from these programs is documented. In fiscal year 2011/12, for example, Metropolitan would have had to transport over 20% more water through its system without its demand-management programs. (*See, e.g.,* 10-AA-2526-62; 31-RT-1809:5-18; 10-AA-02534; 31-RT-1809:19-1813:19.)

management programs. When San Diego proposed a seawater desalination facility to be funded under Metropolitan's Seawater Desalination Program, it cited as a benefit of the project "deferral of the Authority's need for Pipeline 6, thereby reducing or deferring Metropolitan's capital expenditures." (10-AA-02629; *see also* 9-AA-02508-09 [in seeking project approval in 2010, representing that the desalination program would help avoid "distribution system expansion"].)

Second, Metropolitan's demand-management programs create transportation-related benefits by increasing available capacity for system use, including by wheelers and other water transferors. The Wheeling Statutes require public agencies to make their water conveyance facilities available only when there is a certain amount of unused capacity. (Wat. Code, §§ 1810, 1811, subd. (e), § 1814.) "[T]he fact that there is a reduced need to move the water through the system means that there is net capacity to the system that wouldn't have been there otherwise." (31-RT-1815:17-24; *see also* 24-AR2010-006519 (due to Metropolitan's demand-management programs, "more capacity is available in existing facilities for a longer period of time. The capacity made available by conservation and recycling is open to all system users and can be used to complete water transfers"); 58-AR2012-016519 ["All users of Metropolitan's system benefit from the system capacity made available by investments in demand management programs"].) This

is not a hypothetical benefit; "portions of [Metropolitan's] system, even in [the] period since 2008 [] were operated at capacity for times of the year." (31-RT-1857:11-13; *see also* 30-RT-1733:11-1734:6 [examples of capacity constraints, including San Diego Pipeline 3 and 5, which deliver untreated water to San Diego and the Riverside area].) For all these reasons, Metropolitan acts reasonably in allocating the Water Stewardship Rate to transportation because that rate recovers the costs of programs that provide extensive transportation-related benefits.

The superior court, moreover, erred in finding that Metropolitan's Water Stewardship Rate recovers a supply-related rather than a transportation-related cost. Demand-management programs conserve and develop local water supplies; they do not create any water supplies for Metropolitan to sell. "[D]emand management programs do not *produce supply* that Met[ropolitan] is able to move through its system. In fact, what [Metropolitan is] paying for is a reduction in demand in [its] imported system." (31-RT-1816:3-11, emphasis added.) The court erred in reading Metropolitan's statement that "'[t]he central objective of Metropolitan's water conservation program is to help ensure adequate, reliable and affordable water supplies for Southern California'" as an admission that "Met[ropolitan] itself knows that the *primary* benefit is not for transportation, but for supply" (27-AA-07510, emphasis in original). "Supplies" in the quoted statement

refers to the local member agencies' water supplies, not a supply-related cost or benefit for Metropolitan. Conserving and developing the local member agencies' water supplies has nothing to do with Metropolitan's water supplies, which are imported from outside its service area. The superior court erred in confusing the two. (*See, e.g.*, 27-AA-07510 & at fn. 87.)

Because demand-management programs benefit *all* of Metropolitan's member agencies, Metropolitan's decision to charge the Water Stewardship Rate to all users is reasonable. (*See* 31-RT-1801:10-1802:6; 24-AR2010-006519 ["Investments in [demand-management programs] decrease the region's overall dependence on imported water supplies….Similar to public benefit charges in the electric industry, the regional and state-wide benefits of demand management programs are assessed to all users of the Metropolitan system"]; 58-AR2012-016590 ["All users…benefit from the system capacity made available by investments in demand management programs….These projects and programs provide regional benefits to improve regional reliability. It is fair and reasonable to assess the [Water Stewardship Rate] to all users of the Metropolitan system."); *accord* 31-RT-1797:3-11.) Metropolitan's allocation of this rate component to transportation is reasonable and supported by the record.

Attachment 9

From: Office of the General Counsel
Sent: Wednesday, July 20, 2016 12:18 PM
To: solbch1@roadrunner.com; Keith Lewinger (preferred) (Keith.Lewinger@gmail.com); fsteiner@ssvwlaw.com; dirsteiner@gmail.com
Cc: Brett R. Barbre (brbarbre@msn.com); Cynthia Kurtz (dirkurtz@gmail.com); De Jesus,David D; Donald Dear (dldear@hotmail.com); Donald Galleano (donald@galleanowinery.com); Glen C. Dake (dirdake@gmail.com); Glen D. Peterson (glenpsop@icloud.com); Gloria Gray (ggrayi@aol.com); Gloria Gray (mwdggray@gmail.com); jabdo@msn.com; Janna Zurita - Compton, City of (dirjzurita@gmail.com); jannaandchanel@yahoo.com; Jesus E. Quinonez (jquinonez@bushgottlieb.com); John T. Morris - MorrisWater@Earthlink.net; John W. Murray Jr. (jmurray@jwmjr.org); Larry Dick ; Larry McKenney (director.mckenney@gmail.com); Laura Friedman - City of Glendale (laurasf@charter.net); Leticia Vasquez (dirlvasquez@gmail.com); Linda Ackerman (lindaackerman@cox.net); Linda Ackerman (lindaackerman72@gmail.com); Lorraine Paskett (Lorrainepaskett@cambridgelcf.com); Lowenthal #2 Heather Blackmun (Heather.Blackmun@longbeach.gov); Lowenthal,Suja; Mark Gold (mgold@conet.ucla.edu); Marsha Ramos (Dir.mramos@gmail.com); Michael Camacho (dircamacho@gmail.com); Michael Camacho (mcamacho@pacificaservices.com); Michael Touhey (touhey@usgvmwd.org); Michele Martinez (councilwomanmartinez@gmail.com); Peter Beard - Fullerton, City of (dirbeard@gmail.com); Peter Beard, Director ; Randy A. Record (preferred) (dirrecord@gmail.com); Richard Atwater (atwater.richard@gmail.com); Robert Apodaca (boba@centralbasin.org); Robert Wunderlich (rwunderlich@discoveryecon.com); Russell Lefevre Ph. D. (r.lefevre@ieee.org); Stephen J. Faessel (Dirfaessel@gmail.com); Steve Blois (sblois@verizon.net); Suja Lowenthal - Long Beach (siouxja@gmail.com); Sylvia Ballin (dirballin@gmail.com); Yen C. Tu (yentu2@gmail.com); Dir Friedman - Hayrapetian, Hourik (HHayrapetian@Glendaleca.gov); Michele Martinez - Santa Ana, City of (Rflores@santa-ana.org)
Subject: Response Letter to SDCWA Delegation

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Date: July 20, 2016

To: San Diego County Water Authority Directors

From: Marcia Scully, General Counsel

Subject: Response to SDCWA letter regarding July Board Letter 8-5

Attached is Metropolitan Water District's response to SDCWA's letter regarding Metropolitan's conservation programs.

Letter to SDCWA Delegation.pdf... Attachments.pdf

THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Office of the General Counsel

July 20, 2016

Director Michael T. Hogan
Director Keith Lewinger
Director Fern Steiner
San Diego County Water Authority
4677 Overland Avenue
San Diego, CA 92123

Re: Your letter dated July 8, 2016 regarding Board Agenda Item 8-5

Dear Directors Hogan, Lewinger and Steiner:

Chairman Record has requested that I respond to your letter of July 8, 2016 (attached) opposing Item 8-5 on the July 2016 Board Agenda relating to Metropolitan's conservation programs.

With two exceptions, the SDCWA delegation on the Metropolitan Board voted in favor of Metropolitan's demand management programs, including conservation, from 1991 until May 2010, immediately prior to filing the 2010 litigation challenging Metropolitan's rates. There was no change in either Metropolitan's rate structure or the law concurrent with the change in SDCWA's position. (Attachment 1)

With regard to the implementation of the Rate Structure Integrity (RSI) clause and its impact on SDCWA, the following should be noted:

- SDCWA entered into 15 demand management agreements with Metropolitan prior to 2004 that did not contain the RSI clause and were unaffected by the Board action. In fiscal years 2011/12 through 2015/16, SDCWA received $17,984,900 in payments from Metropolitan pursuant to these contracts.

- Over the life of the program, SDCWA has received $66,679,686 in LRP payments. Only West Basin and MWDOC have received more. (Attachment 2)

- Of the six agreements containing the clause, two were fully completed prior to the Board action.

- The Board action did not terminate any payments directly to consumers within the SDCWA service area.

- From July 2011 through February 2016, $68,022,345 in conservation "benefits" was paid to participants in the SDCWA service area, including turf removal rebates.
- Between July 2014 and February 2016, 23% of Metropolitan's turf removal rebates were paid to participants in the SDCWA service area.
- From program inception through February 2016, the SDCWA service area received $128,086,053 in conservation payments, second only to Los Angeles. The next highest cumulative payment is $73,861,395. (Attachment 3)

Your characterization of the decisions by the trial court in the *SDCWA v. Metropolitan* litigation is inaccurate. The court's ruling with respect to the Water Stewardship Rate was in the context of wheeling. The court dismissed SDCWA's claim challenging the RSI clause on both bases SDCWA asserted: (1) it dismissed SDCWA's claim under the Civil Code on the merits, in Metropolitan's favor; and (2) it dismissed SDCWA's claim under the California Constitution for lack of standing, in Metropolitan's favor. Further statements by the court concerning RSI are dicta having no legal consequence and do not constitute a "finding" against Metropolitan.

If you have any questions, please call me at (213) 217-6115.

Very truly yours,

Marcia Scully
General Counsel

MS:jmm

Attachments

cc: Metropolitan Board of Directors
SDCWA Board of Directors
SDCWA Board Secretary Melinda Cogle

July 8, 2016 Letter

San Diego County Water Authority
4677 Overland Avenue • San Diego, California 92123-1233
(858) 522-6600 FAX (858) 522-6568 www.sdcwa.org

July 8, 2016

Randy Record and
Members of the Board of Directors
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, CA 90054-0153

RE: Board Memo 8-5: Approval of Modifications and Additions to the Conservation Programs – **OPPOSE**

Chair Record and Members of the Board:

The Water Authority and its member agencies have a strong record of leadership in water conservation planning, programs and policy implementation. Since the early 1990s, water use efficiency has been a core element of our region's water supply diversification strategy. The San Diego region's per capita use has dropped by nearly 40 percent since then. Even as hydrologic conditions improve this year, the Water Authority and its member agencies are continuing to advance water-use efficiency through programs and outreach designed to firmly entrench water use efficiency a way of life. Our upcoming "Live WaterSmart" outreach campaign is our most recent campaign to ensure our region adopts efficiency as a positive and permanent ethic.

While we strongly support conservation, we must oppose this board action based on both legal and policy grounds. First and foremost, MWD's funding source and implementation are illegal. MWD is continuing to fund its conservation program subsidy costs through imposition of the Water Stewardship Rate, which the Superior Court has already ruled illegal. MWD's program also forces the Water Authority's ratepayers to pay for financial subsidies they may not fully benefit from due to the MWD Board's adoption and enforcement of the "Rate Structure Integrity" clause, simply because the Water Authority chose to challenge MWD's rates in court. But for the question of standing, the Superior Court also found against MWD on the merits of this issue.

We have previously identified several concerns with MWD's conservation programs through our prior letters (see list at the end of this correspondence, the contents of these letters are incorporated herein by reference). Upon other things, MWD's failure to develop a *baseline* that MWD member agencies must meet in order to qualify for regional funding for conservation programs leaves MWD's conservation program subject to challenge. Establishing a baseline is necessary to ensure regional funds go toward paying for conservation savings that go beyond what retail agencies are already legally required to do.
At a policy level, MWD should develop and implement a regional water conservation plan that is

more appropriate for its role as a wholesale water provider. While we recognize the currently proposed program modifications are moving toward more water-efficient landscape education and training resources for homeowners and professionals – a focus the Water Authority has emphasized in recent years – we urge staff to work closely with member agencies so these programs support and are aligned not only with California law but with established local programs. This will help avoid unnecessary duplication between local and regional programs, or other circumstances that could confuse customers or decrease the efficiency of these programs.

Sincerely,

Michael T. Hogan	Keith Lewinger	Fern Steiner
Director	Director	Director

Past Water Authority letters RE conservation:

1. May 25, 2015 Board Memo 5-1: Authorize: (1) Additional funding for conservation incentives; and (2) Implementation of modifications to the Turf Removal Program
2. May 8, 2015 Board Memo 8-2: Authorize (1) $150 million in additional funding for conservation incentives from the Water Stewardship Fund and the Water Management Fund; and (2) Implementation of modifications to the Turf Removal Program -- OPPOSE
3. December 8, 2014 Board Memo 8-1: Authorize: (1) increase of $40 million for conservation incentives and (2) increase to contract authority of the five-year agreement with Electric and Gas Industries Association for administration of Metropolitan's regional conservation rebate program – OPPOSE
4. May 12, 2014 letter RE Board Item 8-6 – Authorize changes to conservation program in response to drought conditions - SUPPORT IMPLEMENTATION OF CONSERVATION MEASURES IN RESPONSE TO STATE DROUGHT CONDITIONS; OPPOSE USE OF ILLEGAL RATES TO PAY FOR WATER CONSERVATION MEASURES
5. March 10, 2014 letter RE Board Item 8-3 – TABLE PENDING RECEIPT OF ADDITIONAL INFORMATION OR IN THE ALTERNATIVE, OPPOSE: Authorize entering into a Water Savings Incentive Program (WSIP) Agreement with Altman's Specialty Plants, Inc. to provide financial incentives for a water use efficiency project
6. February 10, 2014 letter RE Board Memo 8-2 – Authorize $3 million for an On-Site Retrofit Pilot Program: TABLE PENDING DEVELOPMENT OF PROGRAM CRITERIA AND COST OF SERVICE ANALYSIS, OR IN THE ALTERNATIVE, OPPOSE and RE Board Memo 8-7 – Authorize an increase of $20 million for conservation incentives and outreach: OPPOSE UNLESS AMENDED TO ALLOW THE WATER AUTHORITY TO RECEIVE PROGRAM BENEFITS AND COMPLY WITH COST OF SERVICE REQUIREMENTS
7. September 9, 2013 letter RE Board Memo 8-3 – OPPOSE – Authorization to implement New Conservation Program Initiatives
8. May 7, 2012 letter RE Board Memo 8-4 - OPPOSE (authorize changes to water conservation incentives (subsidies) as described
9. November 23, 2011 letter RE Turf Replacement Grant Programs
10. August 15, 2011 letter RE Board Memo 8-7 – Adopt the Long-Term Conservation Plan and revised policy principles on water conservation – OPPOSE
11. July 20, 2011 letter RE Comments on Long Term Conservation Plan Working Draft Version 11
12. November 29, 2010 letter RE Metropolitan's Draft Long Term Conservation Plan
13. August 16, 2010 letter RE August 2010 Board Memo 9-1, MWD Water Conservation Program

Attachment 1

SDCWA Voting Record

Board Meeting	Minute Item	Project	SDCWA Votes
May 26, 2015	50134	Authorize: (1) Additional funding for conservation incentives; and (2) Implementation of modifications to the Turf Removal Program	Noes: Hogan, Lewinger, Steiner, Tu
December 9, 2014	49978	Authorize: (1) increase of $40 million for conservation incentives; and (2) increase to the contract authority of the five-year agreement with Electric and Gas Industries Association for administration of Metropolitan's regional conservation rebate program	Noes: Hogan, Lewinger, Steiner, Tu
October 14, 2014	49923	Authorize refinements to the Local Resources Program	Noes: Hogan, Lewinger, Steiner, Tu
May 13, 2014	49773	Authorize changes to conservation program in response to drought conditions	Noes: Lewinger, Mudd, Steiner; Absent: Hogan
March 11, 2014	49707	Authorize entering into a Water Savings Incentive Program agreement with Altman Specialty Plants, Inc. to provide financial incentives for a water use efficiency project	Noes: Hogan, Lewinger, Mudd, Steiner
February 11, 2014	49675	Authorize $3 million for an On-site Retrofit Pilot Program for converting sites to receive recycled water	Noes: Mudd; Absent: Hogan, Lewinger, Steiner
February 11, 2014	49680	Authorize an increase of $20 million for conservation incentives and outreach	Noes: Mudd; Absent: Hogan, Lewinger, Steiner
October 8, 2013	49569	Authorize entering into a Local Resources Program agreement with Eastern Municipal Water District for the Perris II Brackish Groundwater Desalter	Noes: Hogan, Lewinger, Steiner; Absent: Mudd
September 10, 2013	49541	Authorize staff to enter into funding agreements for Foundational Actions Funding Program proposals	Noes: Hogan, Mudd, Steiner; Absent: Lewinger
September 10, 2013	49542	Authorization to implement New Conservation Program Initiatives	Noes: Hogan, Mudd, Steiner; Absent: Lewinger
July 9, 2013	49472	Authorize entering into a Local Resources Program agreement with city of Anaheim for the Anaheim Water Recycling Demonstration Project	Noes: Lewinger, Mudd, Steiner; Absent: Wilson
May 14, 2013	49406	Authorize entering into a Local Resources Program agreement with the city of Long Beach and the Water Replenishment District of Southern California for the Leo J. Vander Lans Water Treatment Facility Expansion Project	Noes: Mudd, Steiner, Wilson; Absent: Lewinger
April 9, 2013	49381	Approve Foundational Actions Funding Program	Noes: Lewinger, Mudd, Wilson; Absent: Steiner
February 12, 2013	49318	Authorize entering into a Local Resources Program agreement with Calleguas Municipal Water District and Camrosa Water District for the Round Mountain Water Treatment Plant	Noes: Mudd, Steiner, Wilson; Absent: Lewinger
December 11, 2012	49265	Authorize entering into a Local Resources Program agreement with Three Valleys Municipal Water District and California State Polytechnic University, Pomona, for the Cal Poly Pomona Water Treatment Plant	Noes: Lewinger, Mudd, Steiner, Wilson
August 21, 2012	49153	Authorize entering into a Local Resources Program agreement with Municipal Water District of Orange County and El Toro Water District for the El Toro Recycled Water System Expansion Project	Noes: Heidel, Wilson; Absent: Lewinger, Steiner
June 12, 2012	49095	Authorize entering into a Local Resources Program agreement with Municipal Water District of Orange County and the city of San Clemente for the San Clemente Recycled Water System Expansion Project	Noes: Heidel, Lewinger, Steiner, Wilson
May 8, 2012	49068	Authorize changes to water conservation incentives and authorize a five-year agreement with Electric and Gas Industries Association to administer Metropolitan's regional conservation rebate program, in an amount not to exceed $90 million, which includes a cap of $4 million for administrative fees and up to $86 million in conservation incentives (subject to budget approval)	Noes: Heidel, Lewinger, Steiner, Wilson
March 13, 2012	48992	Authorize entering into a Local Resources Program agreement with Los Angeles Department of Water and Power for the North Atwater and Chevy Chase Park Water Recycling Project and the Los Feliz Golf Course Water Recycling Project	Noes: Heidel, Lewinger, Wilson; Absent: Steiner
March 13, 2012	49005	Authorize entering into a Local Resources Program agreement with Los Angeles Department of Water and Power for the Harbor Industrial Recycled Water Project	Noes: Heidel, Lewinger, Wilson; Absent: Steiner
March 13, 2012	49006	Authorize entering into a Local Resources Program agreement with Los Angeles Department of Water and Power for the Hansen Dam Golf Course Water Recycling Project	Noes: Heidel, Lewinger, Wilson; Absent: Steiner
March 13, 2012	49007	Authorize entering into a Local Resources Program agreement with Los Angeles Department of Water and Power for the Griffith Park South Water Recycling Project	Noes: Heidel, Lewinger, Wilson; Absent: Steiner
March 13, 2012	49008	Authorize entering into a Local Resources Program Agreement with Eastern Municipal Water District for EMWD's Recycled Water System Expansion Project	Noes: Heidel, Lewinger, Wilson; Absent: Steiner
March 13, 2012	49009	Authorize entering into a Local Resources Program agreement with West Basin Municipal Water District for the West Basin Water Recycling Program Phase V Project	Noes: Heidel, Lewinger, Wilson; Absent: Steiner
August 16, 2011	48772	Adopt the Long-Term Conservation Plan and revised policy principles on water conservation	Noes: Heidel, Steiner; Absent: Lewinger, Bowersox
June 14, 2011	48709	Authorize entering into a consolidated agreement under the Local Resources Program with the Inland Empire Utilities Agency, Western Municipal Water District, and Chino Basin Desalter Authority for the Chino Basin Desalination Program	Noes: Heidel, Lewinger, Steiner; Absent: Bowersox
May 10, 2011	48661	Authorize changes to Water Conservation Program for implementation in fiscal year 2011/12	Noes: Bowersox, Heidel, Steiner; Absent: Lewinger
January 11, 2011	48538	Authorize entering into a Local Resources Program agreement with the Municipal Water District of Orange County and the Irvine Ranch Water District for the IRWD Wells 21 & 22 Desalter Project	Noes: Heidel, Lewinger, Steiner; Absent: Bowersox
September 14, 2010	48411	Authorize entering into a Local Resources Program agreement with Los Angeles Department of Water and Power for the Van Nuys Area Water Recycling Project	Noes: Heidel, Lewinger, Steiner; Absent: Pocklington
August 17, 2010	48378	Authorize entering into a Local Resources Program agreement with Western Municipal Water District and Elsinore Valley Municipal Water District for the Wildomar Recycled Water System – Phase 1 Project	Noes: Heidel, Lewinger, Pocklington, Steiner
May 11, 2010	48266	Authorize: (1) Water Conservation Plan for fiscal year 2010/11; (2) new three-year contract with Honeywell International for the regional commercial conservation program not to exceed $120 million; and (3) amendment to existing contract with Honeywell International to increase maximum payable by $5 million	Noes: Lewinger, Pocklington, Steiner; Absent: Barret

SDCWA Voting Record

Board Meeting	Minute Item	Project	SDCWA Votes
November 10, 2009	48084	Authorize entering into a Seawater Desalination Program Agreement with the San Diego County Water Authority and its local retail agencies for the Carlsbad Seawater Desalination Project [see the minutes for the substitute motion that was approved by the Board]	Not Voting: Barrett, Lewinger, Pocklington, Steiner
July 14, 2009	47953	Authorize entering into a Local Resources Program agreement with San Diego County Water Authority and the Ramona Municipal Water District for the San Vicente Water Recycling Project	Abstain: Barrett, Lewinger, Pocklington, Steiner
July 14, 2009	47954	Authorize entering into a Local Resources Program agreement with Calleguas Municipal Water District and City of Oxnard for the Advanced Water Purification Facility Project	Aye: Barrett, Lewinger, Pocklington, Steiner
July 14, 2009	47964	Authorize (1) increase of $14.2 million to Metropolitan's Conservation Credits Program fiscal year 2009/10 budget to fund additional needs; (2) amendment to contract with Honeywell International increasing maximum amount payable up to $85 million; and (3) other near-term program changes	Noe: Barrett, Lewinger, Pocklington, Steiner
February 10, 2009	47799	Authorize increase of $20 million to Conservation Credits Program for FY 2008/09 [Motion: "approve additional new cost management actions, and authorize staff to increase funding for the conservation credits program to an amount equal to $40 million, as set forth in the letter signed by the General Manager on January 29, 2009, with the following amendments: (a) The Board will retain authority to change devices and device incentives; and (b) Metropolitan will reimburse member agencies for high efficiency clothes washer incentives added by member agencies that elect to advance up to the $50 per unit state grant incentive, provided that California reinstates grant funding and agrees to honor past rebate activity."]	Aye: Barrett, Lewinger, Pocklington, Steiner
January 13, 2009	47763	Authorize entering into a Local Resources Program agreement with Los Angeles Department of Water and Power for the Taylor Yard Park Water Recycling Project	Aye: Barrett, Bond, Parker, Pocklington
November 18, 2008	47705	Authorize (1) $22 million for extraordinary conservation programs and (2) $13 million of increased contracting authority with Honeywell International to process incentives; and adopt resolution accepting state grant [see minutes for mdification to staff recommendation]	Aye: Bond, Parker, Pocklington; Absent: Barrett
October 14, 2008	47673	Authorize refinements and additions to Metropolitan's Conservation Program	Aye: Barrett, Bond, Parker, Pocklington
August 19, 2008	47603	Authorize entering into a Local Resources Program Agreement with Inland Empire Utilities Agency for the Regional Recycled Water Expansion Project	Aye: Barrett, Bond, Pocklington; Absent: Parker
August 19, 2008	47604	Authorize amendment of Local Resources Program Agreement with Municipal Water District of Orange County and Orange County Water District for the Groundwater Replenishment System Talbert Seawater Intrusion Barrier Component Project	Aye: Barrett, Bond, Pocklington; Absent: Parker
December 11, 2007	47328	Authorize (1) expenditure of $25 million from Water Stewardship Funds; and (2) amendment of the contract with Honeywell International to administer Metropolitan's Commercial/Industrial/ Institutional Conservation Program	Aye: Barrett, Bond, Parker; Absent: Pocklington
August 21, 2007	47205	Authorize $15 million for the Accelerated Public Sector Water Efficiency Partnership Demonstration Program	Aye: Barrett, Parker, Pocklington; Absent: Bond
July 10, 2007	47165	Authorize enhancements for Metropolitan's Water Conservation Program	Aye: Bond, Pocklington; Absent: Barrett, Parker
June 12, 2007	47129	Authorize execution of an agreement for the Chino Basin Desalination Phase II desalter; and appropriate $1.5 million to study expansion of the existing Chino Basin Groundwater Storage Program (Approp. 15272)	Aye: Barrett, Parker, Pocklington; Absent: Bond
April 10, 2007	47049	Authorize Updated Policy and Procedure for Local Resources Program	Aye: Barrett, Bond, Parker; Absent: Pocklington
March 13, 2007	47013	Authorize bridge funding for high-efficiency clothes washer water conservation incentives and a transition to increased incentives for units that save more water	Aye: Barrett, Bond, Parker; Pocklington
November 14, 2006	46869	Authorize entering into a conservation agreement with Proctor & Gamble Paper Products for an Industrial Process Improvement Program project	Item Withdrawn
August 15, 2006	46773	Authorize refinements for Metropolitan's Water Conservation Program	Aye: Lewis, Loveland, Parker, Pocklington
May 16, 2006	46661	Authorize entering into an Industrial Process Improvement Program agreement with Kimberly-Clark Corporation to provide financial incentives for a water use efficiency project	Aye: Lewis, Loveland, Parker, Pocklington
December 13, 2005	46478	Authorize entering into a Local Resources Program Agreement with Los Angeles Department of Water and Power for the Sepulveda Basin Water Recycling Project Phase 4	Aye: Lewis, Loveland, Parker, Pocklington
December 13, 2005	46486	Authorize implementation of conservation incentive level updates and program refinements from Metropolitan's Five-Year Conservation Strategy Plan	Aye: Lewis, Loveland, Parker, Pocklington
August 16, 2005	46341	Authorize entering into a Local Resources Program Agreement with Las Virgenes Municipal Water District for the Decker Canyon Recycled Water Line Extension Project	Aye: Lewis, Loveland, Parker, Pocklington
July 12, 2005	46303	Authorize entering into a Seawater Desalination Program agreement with Long Beach Water Department	Aye: Lewis, Loveland, Parker, Pocklington
July 12, 2005	46305	Authorize entering into a Seawater Desalination Program agreement with Municipal Water District of Orange County	Aye: Lewis, Loveland, Parker, Pocklington
July 12, 2005	46307	Authorize entering into a Seawater Desalination Program agreement with San Diego County Water Authority	Abstain: Lewis, Loveland, Parker, Pocklington
July 12, 2005	46306	Authorize entering into a Seawater Desalination Program agreement with West Basin Municipal Water District	Aye: Lewis, Loveland, Parker, Pocklington
July 12, 2005	46304	Authorize entering into a Seawater Desalination Program agreement with the Los Angeles Department of Water and Power	Aye: Lewis, Loveland, Parker, Pocklington
May 10, 2005	46223	Authorize entering into a Local Resources Program Agreement with Los Angeles Department of Water and Power for the Hansen Area Water Recycling Phase I Project	Aye: Loveland, Parker, Pocklington, Absent: Lewis
May 10, 2005	46224	Authorize entering into three Local Resources Program agreements with Three Valleys Municipal Water District and Upper San Gabriel Valley Municipal Water District for the City of Industry Regional Recycled Water Project	Aye: Loveland, Parker, Pocklington, Absent: Lewis

SDCWA Voting Record

Board Meeting	Minute Item	Project	SDCWA Votes
April 12, 2005	46187	Authorize entering into a Local Resources Program agreement with Calleguas Municipal Water District and Ventura County Waterworks District No. 8 for the Tapo Canyon Groundwater Treatment Project	Aye: Lewis, Loveland, Parker; Absent: Pocklington
April 12, 2005	46185	Authorize entering into a Local Resources Program agreement with Three Valleys Municipal Water District and the city of Pomona for the Harrison Well No. 37 Groundwater Treatment Project	Aye: Lewis, Loveland, Parker; Absent: Pocklington
April 12, 2005	46186	Authorize entering into a new agreement with San Diego County Water Authority and Otay Water District to replace two existing Local Resources Program agreements for the Otay Water Reclamation and Otay Recycled Water Distribution System Expansion Projects	Abstain: Lewis, Loveland, Parker; Absent: Pocklington
November 9, 2004	45996	Approve increases to Metropolitan's existing High Efficiency Clothes Washer incentive and $750,000 additional funding to sustain the program through the remainder of fiscal year 2004/05	Aye: Lewis, Parker, Pocklington; Absent: Loveland
September 14, 2004	45914	Authorize entering into a Local Resources Program Agreement with Eastern Municipal Water District for the Recycled Water Pipeline Reach 16 Project	Aye: Lewis, Loveland, Parker, Pocklington
September 14, 2004	45913	Authorize entering into a Local Resources Program Agreement with Upper San Gabriel Valley Municipal Water District for the Direct Reuse Project Phase IIA	Aye: Lewis, Loveland, Parker, Pocklington
September 14, 2004	45912	Authorize upgrades to the commercial and institutional landscape water efficiency incentive program	Aye: Lewis, Loveland, Parker, Pocklington
September 14, 2004	45916	Award contract to Honeywell DMC Services, L.L.C. for management and marketing services up to $20 million over five years for Metropolitan's commercial/industrial/institutional conservation program	Aye: Lewis, Loveland, Parker, Pocklington
August 17, 2004	45879	Authorize entering into a Local Resources Program Agreement with Municipal Water District of Orange County and Irvine Ranch Water District for the Michelson/Los Alisos Water Reclamation Plants Recycled Water Upgrades and Distribution System Expansion Project	Aye: Lewis, Parker, Pocklington; Absent: Loveland
April 13, 2004	45721	Authorize entering into a Local Resources Program Agreement with the Municipal Water District of Orange County and the Orange County Water District for the Groundwater Replenishment System Seawater Barrier Project [see minutes for amendment to staff recommendation]	Aye: Parker; Absent: Lewis, Loveland, Turner
January 13, 2004	45638	Authorize long-term regional Commercial/Industrial/Institutional rebate program and additional $2.5 million to fund existing pilot program until new vendor agreement is executed	Aye: Lewis, Loveland, Turner; Absent: Parker
October 14, 2003	45540	Authorize a landscape water-use efficiency incentive for commercial weather-based irrigation controllers	Aye: Loveland, Parker, Turner; Absent: Lewis
May 13, 2003	45347	Authorize an amendment to the existing contract with WaterWise Consulting for up to $1 million of services for water conservation	Aye: Lewis, Loveland, Parker, Turner
February 11, 2003	45208	Adopt policy principles regarding water conservation activities	Aye: Lewis, Loveland, Parker, Turner
December 10, 2002	45113	Approve increased conservation credits funding of $3 million for the High Efficiency Clothes Washer Program	Aye: Ball, Lewis, Loveland, Parker
December 10, 2002	45115	Authorize (1) finalizing contract terms and principles for Seawater Desalination Program agreements, and (2) development of Local Resources Program action plan for 2003	Aye: Ball, Lewis, Loveland, Parker
August 20, 2002	44974	Authorize two conservation programs and new items to receive incentives under the Conservation Credits Program	Aye: Ball, Lewis, Loveland, Parker
May 14, 2002	44870	Authorize an increase of $5.4 million in contract value and within existing appropriation for Honeywell DMC Services, Inc. to continue vendor services for the Regionwide Commercial, Industrial, Institutional Rebate Program through June 2004	Aye: Ball, Lewis, Parker; Absent: Loveland
August 20, 2001	44577	Authorize an additional $4 million to allow Metropolitans Commercial, Industrial and Institutional Pilot Regional Conservation Program to continue until February 2004	Aye: Ball, Lewis, Parker; Absent: Krauel
July 11, 2000	44099	Approved the amendment to the Local Projects Program Agreement for the Arlington Desalter Project, as set forth in the confidential letter signed by the General Manager on June 27, 2000.	Aye: Krauel, Lewis, Parker, Turner, Watton; Absent: Tinker
March 14, 2000	43935	Local Resources Program Agreement for the Juan Well Filter Facility with Central Basin Municipal Water District	Aye: Lewis, Parker, Turner; Absent: Krauel, Tinker, Watton
March 14, 2000	43928	Request Authorization to Enter into a Three-year Agreement with Honeywell DMC Services, Inc., not to exceed $2.5 Million (80 percent for Customer Rebates and 20 percent for Program Marketing and Administration) to Provide Enhanced Commercial Services under the Conservation Credits Program	Aye: Lewis, Parker, Turner; Absent: Krauel, Tinker, Watton
February 8, 2000	43898	Local Resources Program Agreement for the Capistrano Valley Non-Domestic Water System Expansion Project with the Municipal Water District of Orange County and Capistrano Valley Water District	Aye: Lewis, Parker, Tinker, Turner; Absent: Krauel, Watton
February 8, 2000	43898	Local Resources Program Agreement for the Encina Basin Water Reclamation Project – Phase 2 Expansion with San Diego County Water Authority and Carlsbad Municipal Water District (Carlsbad)	Abstain: Lewis, Parker, Tinker, Turner; Absent: Krauel, Watton
February 8, 2000	43898	Local Resources Program Agreement for the Rincon del Diablo Recycled Water Program with the San Diego County Water Authority and the Rincon del Diablo Municipal Water District	Abstain: Lewis, Parker, Tinker, Turner; Absent: Krauel, Watton
December 14, 1999	43818	Local Resources Program Agreement for the Harbor Water Recycling Project with the City of Los Angeles Department of Water and Power	Aye: Lewis, Parker, Watton; Absent: Krauel, Tinker, Turner
November 16, 1999	43787	Agreement for Ladera Ranch and Talega Valley with Municipal Water District of Orange County and Santa Margarita Water District for the Nondomestic Water System Development Project	Aye: Krauel, Lewis, Parker, Tinker, Turner, Watton
November 16, 1999	43788	Local Resources Program Agreement for the Phase 4 Reclamation System Expansion Project with Municipal Water District of Orange County and Moulton Niguel Water District	Aye: Krauel, Lewis, Parker, Tinker, Turner, Watton
October 12, 1999	43747	Request for Authorization to Participate in Conservation Programs with Utilities and other Agencies	Aye: Krauel, Lewis, Parker, Turner, Watton; Absent: Tinker
September 14, 1999	43715	Authorization to enter into tolling agreement and update on negotiations regarding Santa Ana Watershed Project Authority's Arlington Desalter Project	Aye: Krauel, Lewis, Parker, Turner, Watton; Absent: Tinker

SDCWA Voting Record

Board Meeting	Minute Item	Project	SDCWA Votes
September 14, 1999	43716	Local Resources Program Agreement for the Otay Recycled Distribution Expansion Project with San Diego County Water Authority and Otay Water District	Abstain: Krauel, Lewis, Parker, Tinker, Turner, Watton
August 17, 1999	43676	Local Resources Program Agreement for the Olivenhain Recycled Water Project-Southeast Quadrant with San Diego County Water Authority and Olivenhain Municipal Water District	Abstain: Krauel, Lewis, Parker, Tinker, Turner, Watton
March 9, 1999	43440	Local Resources Program Agreement for the Alamitos Barrier Reclaimed Water Project	Aye: Krauel, Lewis, Tinker, Turner, Watton; Absent: Frahm
March 9, 1999	43441	Local Resources Program for the Dry Weather Runoff Reclamation Facility	Aye: Krauel, Lewis, Tinker, Turner, Watton; Absent: Frahm
February 9, 1999	43394	Local Resources Program Agreement for the Colored Water Treatment Facility	Aye: Frahm, Krauel, Lewis, Tinker, Turner, Watton
February 9, 1999	43395	Local Resources Program Agreement for the Temescal Basin Desalting Facility	Aye: Frahm, Krauel, Lewis, Tinker, Turner, Watton
February 9, 1999	43396	Local Resources Program Agreement for the Westlake Wells - Tapia WRF Intertie Project	Aye: Frahm, Krauel, Lewis, Tinker, Turner, Watton
February 9, 1999	43397	Regional High Efficiency Clothes Washer Rebate Program	Aye: Frahm, Krauel, Lewis, Tinker, Turner, Watton
November 10, 1998	43271	Groundwater Recovery Program for the Sepulveda Desalter Project	Aye: Krauel, Tinker; Noe: Mason; Absent: Frahm, Lewis, Parker
October 13, 1998	43224	Groundwater Recovery Program for the Madrona Desalination Facility Project	Aye: Frahm, Krauel, Lewis, Mason, Parker, Tinker
October 13, 1998	43225	Metropolitan's Large Landscape and Landscape Conservation Education Program	Aye: Frahm, Krauel, Lewis, Mason, Parker, Tinker
September 15, 1998	43171	Groundwater Recovery Program for the Beverly Hills Desalter Project	Aye: Krauel, Mason, Parker, Tinker; Absent: Frahm, Lewis
August 18, 1998	43119	Authorization for the General Manager to Enter into an Agreement with Municipal Water District of Orange County and Moulton Niguel Water District to Fund an Already Installed Landscape Conservation Project	Aye: Frahm, Krauel, Lewis, Mason, Parker, Tinker
August 18, 1998	43121	Groundwater Recovery Program for the Mission Basin Desalting Facility Expansion	Abstain: Frahm, Krauel, Lewis, Mason, Parker, Tinker
August 18, 1998	43120	Groundwater Recovery Program for the San Juan Basin Desalter Project	Aye: Frahm, Krauel, Lewis, Mason, Parker, Tinker
June 9, 1998	42995	Groundwater Recovery Program for the Capistrano Beach Desalter Project	Aye: Krauel, Lewis, Parker, Tinker; Absent: Frahm, Mason
June 9, 1998	43021	Implementation of Local Resources Program and Administrative Rules	Aye: Krauel, Lewis, Parker, Tinker; Absent: Frahm, Mason
December 9, 1997	42751	Local Resources Program Principles Developed by the Rate Refinement Participants	Aye: Frahm, Krauel, Mason, Parker, Tinker, Watton
November 18, 1997	42714	Advances to Member Agencies to Operate Conservation Programs	Aye: Krauel, Parker, Tinker, Watton; Noe: Mason; Absent: Frahm
September 9, 1997	42609	Commercial, Industrial, and Institutional (CII) Conservation Program	Aye: Frahm, Krauel, Mason, Parker, Watton; Absent: Griffen
July 9, 1996	41967	Groundwater Recovery Program for the Lower Sweetwater River Basin Groundwater Demineralization Project, Phase I	Abstain: Krauel, Mason, Parker; Absent: Frahm, Griffen, Watton
July 9, 1996	41969	Landscape Conservation Program for Fiscal Year 1996-97	Aye: Krauel, Mason, Parker; Absent: Frahm, Griffen, Watton
May 14, 1996	41894	The City of Los Angeles Department of Water and Power Request for Authorization to Increase the Maximum Number of Ultra-Low-Flush Toilets to be Distributed by an Existing Agreement through June 30, 1996.	Aye: Mason, Parker, Watton; Absent: Frahm, Griffen, Krauel
April 9, 1996	41841	Co-Funding Proposal for Single-Family, Residential Indoor/Outdoor Survey Programs	Aye: Frahm, Krauel, Mason, Parker, Watton; Absent: Griffen
April 9, 1996	41840	Request for Authorization to Increase the Maximum Number of Ultra-Low- Flush Toilets to be Distributed by Richard Heath Associates, Inc. through June 30,1996	Aye: Frahm, Krauel, Mason, Parker, Watton; Absent: Griffen
March 12, 1996	41811	Alternative Solutions for Contracting of Community-Based-Organization Ultra- Low-Flush Toilet Programs	Aye: Mason, Parker; Absent: Frahm, Griffen, Krauel, Watton
August 22, 1995	41549	Advance conversion of existing projects under the Local Projects Program to the Local Resource Program [see minutes for the amendment to the staff recommnedation]	Noe: Frahm, Krauel, Parker, Watton; Absent: Griffen, Mason
August 22, 1995	41550	Establishment of Fixed incentive Level for Single-Family Residential Indoor/Outdoor Water Efficiency Surveys	Aye: Frahm, Krauel, Parker, Watton; Absent: Griffen, Mason
March 14, 1995	41313	San Diego County Water Authority Water Repurification Feasibility Study Phase II	Abstain: Frahm, Krauel, Parker, Watton; Absent: Griffen, Mason
October 11, 1994	41070	Authorization for the General Manager to Enter into an Agreement for a Residential Indoor/Outdoor Water Audit Pilot Program	Aye: Frahm, Mason, Parker; Absent: Griffen, Krauel, Watton
October 11, 1994	41083	Requests from Member Agencies for Additional Funding for Ultra- Low-Flush Toilet Projects for FY 1994-95	Aye: Frahm, Mason, Parker; Absent: Griffen, Krauel, Watton
June 14, 1994	40873	Authorization to Allocate Funds and to Enter Into Agreements to Implement the Ultra-Low-Flush Toilet Retrofit Program for Fiscal Year 1994-95	Aye: Frahm, Griffen, Krauel, Mason, Parker, Watton
May 10, 1994	40833	Groundwater Recovery Program Agreement for the Chino Basin Desalination Program, Phase I	Aye: Frahm, Griffen, Krauel, Mason, Parker; Absent: Watton
February 8, 1994	40681	Increased Funding of Ultra-Low-Flush Toilet Retrofit Programs	Aye: Frahm, Griffen, Krauel, Mason, Parker, Watton
December 14, 1993	40594	Revisions to the Administrative Code Regarding the Local Projects Program	Aye: Frahm, Griffen, Krauel, Mason, Parker, Watton
July 13, 1993	40343	Request for Flat-Rate Funding for the 1993-94 Fiscal Year Ultra-Low-Flush Toilet Program	Aye: Frahm, Griffen, Krauel, Leach, Mason, Parker
March 9, 1993	40119	Color Removal Project	Aye: Frahm, Krauel, Leach, Mason; Absent: Griffen, Stickney
March 9, 1993	40118	Ultra-Low-Flush (ULF) Toilet Replacement Project Flat-Rate Funding	Aye: Frahm, Krauel, Leach, Mason; Absent: Griffen, Stickney
March 9, 1993	40121	Landscape Conservation Program	Aye: Frahm, Krauel, Leach, Mason; Absent: Griffen, Stickney
February 9, 1993	40092	Fiscal Year 1992-93 Conservation Branch Budget and Conservation Credits Program Criteria	Aye: Frahm, Griffen, Krauel, Leach, Mason; Absent: Stickney
February 9, 1993	40077	Groundwater Recovery Program Agreement for Menifee Basin Desalter Project	Aye: Frahm, Griffen, Mason; Absent: Stickney, Krauel, Leach
February 9, 1993	40078	Metropolitan's Participation in U.S. Bureau of Reclamation's Comprehensive Water Reclamation and Reuse Study	Aye: Frahm, Griffen, Leach, Mason; Absent: Stickney, Krauel

SDCWA Voting Record

Board Meeting	Minute Item	Project	SDCWA Votes
December 8, 1992	39972	Groundwater Recovery Program Agreement for Rowland Groundwater Treatment Project	Aye: Frahm, Griffen, Leach, Krauel, Mason, Stickney
December 8, 1992	39981	Local Projects Program Negotiations with Las Virgenes Municipal Water District and South Coast Water District	Aye: Frahm, Griffen, Leach, Krauel, Mason, Stickney
October 13, 1992	39880	Commercial, Industrial, and Institutional Conservation Program	Aye: Frahm, Griffen, Leach, Krauel, Mason, Stickney
September 15, 1992	39838	Reclaimed Water for Agricultural Purposes in the Local Projects Program	Aye: Frahm, Krauel; Absent: Griffen, Madigan, Mason, Stickney
August 20, 1992	39795	Allocation and Implementation of Ultra-Low-Flush Toilet Projects	Aye: Frahm, Madigan; Absent: Griffen, Krauel, Mason, Stickney
July 14, 1992	39721	Conservation Credits Program Funding Policy	Aye: Griffen, Madigan, Mason, Stickney; Absent: Frahm, Krauel
July 14, 1992	39707	Groundwater Recovery Program Agreement for City of Burbank's Lake Street GAC Treatment Plant	Aye: Griffen, Madigan, Mason, Stickney; Absent: Frahm, Krauel
January 14, 1992	39406	Santa Monica Groundwater Treatment Project Groundwater Recovery Program Agreement	Aye: Griffen, Krauel, Mason, Starkey, Stickney; Absent: Madigan
December 10, 1991	39364	Oceanside Desalter Project Groundwater Recovery Program Agreement	Aye: Griffen, Krauel, Mason, Madigan, Stickney; Absent: Starkey

Attachment 2

Local Resources Program Expenditures ($)

Fiscal Year:	1982 -1995	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
MWDOC	$8,608,426.4	$1,847,507.0	$2,514,278.8	$2,158,511.6	$2,748,601.0	$3,787,893.0	$3,814,443.1	$3,832,972.0	$3,960,170.4	$3,993,123.4	$4,002,239.6	$5,134,127.3
West Basin	$40,178.6	$2,746,646.2	$3,934,925.0	$4,828,750.0	$5,109,900.0	$5,677,525.0	$5,657,450.0	$6,969,125.0	$6,956,700.0	$6,138,250.0	$6,017,025.0	$5,913,475.0
SDCWA	$1,053,080.0	$791,505.2	$1,114,530.8	$924,578.7	$1,811,837.0	$2,625,324.0	$2,801,160.0	$3,200,899.8	$3,109,610.4	$3,377,377.3	$2,718,028.4	$2,948,897.1
Western	$4,611,254.2	$565,202.4	$1,226,219.2	$518,481.4	$493,794.0	$1,093,817.4	$2,043,431.5	$2,495,151.0	$2,915,334.5	$3,392,870.0	$3,264,379.0	$3,678,325.0
IEUA	$0.0	$0.0	$0.0	$0.0	$15,446.2	$76,307.0	$899,211.6	$1,124,725.0	$1,326,845.6	$1,461,734.2	$1,246,450.0	$1,833,941.0
Central Basin	$1,075,228.0	$629,961.2	$978,175.0	$833,127.4	$879,987.6	$1,028,550.0	$948,539.7	$1,044,520.0	$968,859.1	$1,050,002.2	$876,415.8	$1,277,915.7
Eastern	$0.0	$214,060.0	$316,870.4	$233,510.2	$313,790.4	$324,940.0	$393,778.0	$426,181.4	$478,742.4	$1,146,384.2	$715,828.8	$1,059,942.6
Calleguas	$1,848.0	$68,884.2	$198,844.8	$138,661.6	$174,959.4	$200,200.0	$192,007.2	$200,200.0	$198,121.0	$383,475.4	$434,649.6	$459,797.8
Los Angeles	$211,796.2	$121,814.0	$128,898.0	$113,806.0	$115,038.0	$100,408.0	$104,104.0	$112,112.0	$109,956.0	$137,676.0	$101,948.0	$144,034.0
Glendale	$162,624.0	$96,126.6	$178,852.8	$170,734.8	$171,733.2	$301,936.6	$274,618.0	$271,361.8	$252,862.6	$287,051.8	$200,404.0	$213,740.2
Torrance	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$58,920.0	$410,232.0	$611,600.0	$520,525.0	$440,100.0
Long Beach	$1,020,234.6	$176,360.8	$261,800.0	$261,800.0	$261,800.0	$169,199.8	$46,623.5	$85,158.2	$184,522.8	$203,218.4	$181,335.0	$201,124.0
Burbank	$0.0	$269,486.4	$107,963.0	$180,621.0	$108,125.0	$120,775.0	$114,775.0	$122,300.0	$93,050.0	$116,650.0	$127,350.0	$162,150.0
Beverly Hills	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$99,775.0	$463,525.0	$340,475.0	$310,150.0
Las Virgenes	$324,585.8	$56,548.8	$67,359.6	$43,027.6	$66,004.4	$99,537.6	$127,300.0	$127,300.0	$107,800.0	$107,800.0	$107,800.0	$107,800.0
Three Valleys	$91,429.8	$77,000.0	$71,687.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
USGVMWD	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Santa Ana	$18,033.4	$19,573.4	$88,120.0	$102,275.0	$96,350.0	$111,225.0	$97,725.0	$24,225.0	$21,600.0	$29,500.0	$32,750.0	$25,400.0
Foothill	$277,886.8	$132,640.2	$136,752.0	$95,433.8	$125,725.6	$55,039.6	$22,283.8	$10,225.6	$0.0	$0.0	$0.0	$0.0
Santa Monica	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$3,165.0	$12,285.0
Anaheim	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Compton	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Fullerton	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Pasadena	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
San Marino	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
San Fernando	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Total	**$17,496,605.8**	**$7,813,316.4**	**$11,325,276.4**	**$10,603,319.1**	**$12,493,091.8**	**$15,772,678.0**	**$17,537,450.4**	**$20,105,376.8**	**$21,194,181.8**	**$22,900,237.9**	**$20,890,768.2**	**$23,923,204.7**

Source: LRP-$Vol-from inception-11July2016.xlsx

Local Resources Program Expenditures ($)

Fiscal Year:	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	Total
MWDOC	$5,248,674.5	$6,086,685.7	$11,789,487.6	$13,606,086.4	$13,074,977.5	$13,039,846.8	$13,761,014.9	$13,575,007.7	$14,516,625.3	$12,732,929.8	**$163,833,629.8**
West Basin	$7,329,175.0	$8,137,775.0	$7,647,475.0	$7,815,671.0	$6,835,350.0	$7,156,125.0	$7,418,675.0	$8,769,025.0	$8,479,225.0	$7,644,325.0	**$137,222,770.8**
SDCWA	$4,234,393.1	$5,154,082.6	$4,865,712.9	$3,975,538.3	$3,988,230.1	$3,374,052.0	$3,883,956.0	$4,250,662.0	$3,952,134.8	$2,524,095.5	**$66,679,686.0**
Western	$3,524,000.0	$5,338,650.0	$5,268,100.0	$2,533,555.0	$1,527,575.0	$1,727,243.1	$2,658,965.0	$2,848,811.2	$2,439,612.2	$611,870.0	**$54,776,641.1**
IEUA	$2,205,804.8	$4,663,820.4	$5,118,949.2	$3,836,747.0	$3,898,510.6	$3,012,093.1	$3,737,965.0	$3,927,811.2	$3,470,905.6	$2,079,000.0	**$43,936,267.5**
Central Basin	$1,457,186.6	$1,592,321.0	$1,575,831.6	$1,596,576.4	$1,517,891.0	$1,597,897.4	$1,715,070.2	$1,683,372.5	$1,412,906.2	$1,260,332.3	**$27,000,666.9**
Eastern	$1,362,782.4	$1,044,622.6	$1,305,019.6	$1,550,374.8	$1,209,277.7	$1,431,445.0	$1,224,423.9	$1,713,407.8	$1,879,743.0	$1,549,381.4	**$19,894,506.6**
Calleguas	$517,501.6	$553,768.6	$642,719.0	$579,178.6	$448,063.0	$543,188.8	$441,502.6	$50.0	$88,825.0	$360,475.0	**$6,826,921.2**
Los Angeles	$326,513.0	$266,575.0	$311,251.0	$434,887.1	$459,560.9	$433,813.0	$517,941.9	$768,158.1	$859,418.4	$778,697.2	**$6,658,405.8**
Glendale	$263,207.4	$286,548.2	$289,950.8	$274,365.8	$223,328.8	$271,827.8	$324,900.0	$336,026.8	$300,938.8	$155,764.8	**$5,308,905.6**
Torrance	$419,025.0	$317,675.0	$162,750.0	$283,675.0	$315,150.0	$348,995.0	$347,400.0	$325,396.5	$207,225.0	$217,382.0	**$4,986,050.5**
Long Beach	$335,011.6	$243,628.0	$249,018.0	$159,112.8	$135,119.6	$12,982.2	$64,125.6	$132,116.6	$90,167.0	$55,008.8	**$4,529,467.3**
Burbank	$182,200.0	$190,150.0	$194,425.0	$177,050.0	$167,125.0	$193,700.0	$219,525.0	$276,575.0	$283,123.5	$326,850.0	**$3,733,968.9**
Beverly Hills	$307,750.0	$318,425.0	$213,100.0	$272,075.0	$204,750.0	$235,900.0	$194,625.0	$177,800.0	$54,850.0	$0.0	**$3,193,200.0**
Las Virgenes	$107,800.0	$107,800.0	$107,800.0	$107,738.4	$107,800.0	$86,255.4	$107,800.0	$107,800.0	$100,331.0	$0.0	**$2,283,988.6**
Three Valleys	$0.0	$109,110.0	$122,872.5	$170,630.0	$137,960.0	$185,370.0	$218,380.0	$252,930.0	$239,920.0	$115,495.0	**$1,792,784.3**
USGVMWD	$157,560.0	$83,208.0	$68,008.0	$46,160.0	$96,200.3	$101,238.6	$157,494.3	$184,163.0	$144,658.0	$109,368.0	**$1,148,058.2**
Santa Ana	$34,800.0	$28,500.0	$31,750.0	$32,375.0	$20,225.0	$66,350.0	$53,725.0	$80,000.0	$80,000.0	$52,000.0	**$1,146,501.8**
Foothill	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$855,987.4**
Santa Monica	$15,480.0	$11,475.0	$17,505.0	$14,385.0	$11,310.0	$12,480.0	$13,350.0	$14,145.0	$16,290.0	$9,885.0	**$151,755.0**
Anaheim	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$700.0	$2,425.0	**$3,125.0**
Compton	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$0.0**
Fullerton	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$0.0**
Pasadena	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$0.0**
San Marino	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$0.0**
San Fernando	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	**$0.0**
Total	**$28,028,865.0**	**$34,534,820.1**	**$39,981,725.2**	**$37,466,181.6**	**$34,378,404.5**	**$33,830,803.2**	**$37,060,839.3**	**$39,423,258.4**	**$38,617,598.8**	**$30,585,284.8**	**$555,963,288.2**

Source: LRP-$Vol-from inception-11July2016.xlsx

Attachment 3

Conservation Benefits - By Amount

Fiscal Year Ending	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Los Angeles	276,640	6,325,073	3,500,000	9,147,560	3,967,500	8,056,900	2,491,380	2,544,540	4,990,185	5,474,615	2,868,658	5,606,343	4,467,330	4,829,945	5,398,359
San Diego	1,409,523	4,567,515	2,750,739	4,262,698	3,242,921	-28,375	2,688,004	3,012,950	4,292,513	2,438,253	1,292,277	2,774,667	2,969,975	3,597,059	2,200,419
MWDOC	135,000	838,402	102,564	267,468	319,571	1,884,644	671,831	2,244,270	1,146,846	1,696,471	1,542,397	1,762,271	2,723,597	2,824,378	950,484
Western	0	282,635	0	945	59,700	0	201,540	194,880	101,207	25,934	164,493	74,646	253,397	357,426	199,258
Inland Empire	0	522,277	25,000	4,164	86,867	295,721	141,795	52,656	164,240	16,680	124,785	7,716	442,421	681,304	664,094
Calleguas	0	469,424	289,520	76,034	36,000	1,736	218,500	116,928	217,628	170,940	28,661	167,320	268,161	93,347	173,182
Eastern	0	213,604	36,375	0	138,974	203,557	159,220	85,678	100,772	106,603	29,232	97,331	124,157	146,553	127,204
Central Basin	401,584	811,188	764,084	529,966	79,860	143,495	125,829	645,077	743,740	400,920	691,845	647,323	356,968	428,077	768,488
West Basin	287,390	771,536	659,890	660,089	29,760	102,361	305,783	330,112	88,638	14,852	307,680	397,767	301,918	328,302	310,330
Three Valleys	0	232,571	130,962	56,748	38,562	355,435	67,343	319,379	230,975	242,958	204,624	98,208	150,519	315,599	189,024
Upper San Gabriel	0	390,059	44,544	66,828	-30,205	386,374	168,507	232,811	272,720	101,820	22,049	156,119	105,243	208,187	192,681
Long Beach	0	209,499	0	0	60,000	299,760	201,909	352,560	58,640	535,240	262,020	14,103	635,760	499,460	260,163
Anaheim	0	630,956	0	157,477	140,502	414,701	165,663	240,167	149,417	404,335	489,214	490,423	762,415	610,791	296,001
Pasadena	333,935	248,946	200,392	15,995	5,762	115,080	319,173	52,860	122,220	10,080	18,701	21,861	136,988	224,902	116,266
Glendale	0	265,264	0	66,256	1,727	5,000	40,770	0	0	1,659	800	34,627	156,674	106,911	149,839
Santa Ana	0	141,854	0	0	13,641	42,863	38,313	123,654	178,736	515,155	363,726	601,996	661,037	779,479	110,783
Santa Monica	118,500	1,017,372	523,998	1,201	4,493	50,679	982,049	1,000	144,081	170,520	146,680	51,819	71,682	141,311	73,249
Las Virgenes	23,300	31,340	76,572	3,541	43,727	89,871	217,909	33,683	48,123	71,179	30,313	29,700	63,217	99,722	71,887
Burbank	0	306,917	102,250	69,479	135,180	0	185,382	27,723	116,220	60,000	52,920	47,001	69,497	96,632	65,298
Fullerton	0	54,709	0	0	0	47,712	28,344	49,593	108,750	124,920	120,321	94,619	194,685	158,881	73,351
Foothill	0	46,223	16,489	4,971	14,810	6,680	1,875	2,625	3,150	13,380	20,760	13,924	30,599	25,638	54,500
Torrance	0	60,547	0	2,306	2,590	169,440	0	0	0	0	12,805	0	16,035	50,657	31,677
Compton	0	38,653	0	3,884	96,928	6,160	0	9,126	0	70,020	0	0	119,760	8,901	11,180
Coastal	91,373	191,193	0	0	120,863	86,048	46,794	69,132	24,399	160,236	22,740	0	0	0	0
Beverly Hills	0	14,803	0	1,105	0	0	0	0	0	0	0	1,405	14,194	15,919	36,061
San Marino	0	6,268	6,306	3,661	9,577	-1,798	3,660	420	1,260	0	660	0	0	0	0
San Fernando	0	10,958	0	0	0	0	83,700	0	0	0	0	0	0	0	0
Total	**3,077,245**	**18,699,787**	**9,229,685**	**15,402,375**	**8,619,308**	**12,734,043**	**9,555,273**	**10,741,825**	**13,304,460**	**12,826,770**	**8,818,361**	**13,191,184**	**15,096,229**	**16,629,375**	**12,523,778**

Conservation Benefits - By Amount

Fiscal Year Ending	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
Los Angeles	3,329,714	3,122,769	$2,885,101	3,547,865	4,449,253	6,548,871	5,149,898	4,675,081	9,825,494	42,711,482	51,857,574	**208,048,128**
San Diego	1,737,147	2,406,416	$1,532,221	6,596,738	3,852,974	2,467,076	1,156,461	950,419	1,665,086	25,146,778	39,103,601	**128,086,053**
MWDOC	1,372,592	2,778,304	$3,139,371	5,314,290	3,554,878	1,989,779	1,557,477	1,892,043	2,015,404	14,851,719	16,285,345	**73,861,395**
Western	416,565	426,111	$1,543,352	2,962,014	2,406,318	497,375	813,182	898,111	1,004,389	7,613,832	10,139,043	**30,636,350**
Inland Empire	889,146	468,243	$1,991,372	4,080,763	1,151,947	549,314	577,383	510,316	535,329	2,829,018	8,535,804	**25,348,355**
Calleguas	44,424	316,632	$103,163	505,817	409,768	279,350	391,188	175,126	245,657	7,150,474	12,600,758	**24,549,736**
Eastern	173,999	1,421,026	$934,267	3,071,741	1,531,187	505,653	453,783	602,348	452,975	6,173,561	6,845,407	**23,735,207**
Central Basin	530,811	1,072,948	$1,294,481	1,491,344	1,859,368	430,526	478,388	392,578	223,189	2,385,454	3,742,318	**21,439,850**
West Basin	328,899	882,887	$523,179	1,731,703	1,359,751	517,653	662,094	443,211	402,446	2,852,754	5,043,102	**19,644,085**
Three Valleys	161,318	167,629	$629,107	1,701,217	839,423	385,050	314,829	229,633	269,458	3,830,194	6,704,989	**17,865,755**
Upper San Gabriel	265,594	602,879	$1,378,220	1,459,177	898,588	385,448	347,152	346,786	462,901	2,299,534	3,683,851	**14,447,868**
Long Beach	301,946	226,520	$402,340	618,230	652,887	411,815	223,320	332,899	528,960	2,115,743	3,923,260	**13,127,035**
Anaheim	313,194	435,628	$406,377	1,055,419	560,188	80,297	194,737	69,276	109,899	1,121,272	1,428,712	**10,727,060**
Pasadena	130,634	330,226	$319,326	417,477	151,069	123,814	111,996	104,545	278,505	1,770,661	2,967,691	**8,649,104**
Glendale	104,649	82,663	$82,479	94,714	93,465	102,352	31,694	13,337	28,403	2,926,962	2,274,430	**6,664,674**
Santa Ana	82,288	184,330	$181,909	316,197	271,459	44,942	25,019	28,507	33,274	370,253	782,336	**5,891,750**
Santa Monica	124,357	135,740	$107,803	111,579	97,376	24,584	17,334	17,847	81,197	197,885	317,007	**4,731,343**
Las Virgenes	31,525	35,539	$58,414	200,948	155,352	75,963	33,520	60,022	99,972	1,350,150	1,649,575	**4,685,062**
Burbank	42,413	52,233	$67,687	252,015	171,305	123,348	70,388	57,834	67,793	646,617	1,043,479	**3,929,611**
Fullerton	51,735	61,397	$344,309	349,594	173,275	286,977	148,061	58,258	42,868	563,802	663,225	**3,799,385**
Foothill	23,201	47,119	$32,134	87,360	30,626	72,961	32,526	37,946	123,462	1,165,531	1,000,799	**2,909,288**
Torrance	36,352	59,377	$111,765	101,953	69,427	148,153	42,848	71,166	134,200	389,862	593,952	**2,105,111**
Compton	5,270	61,323	$7,438	93,895	10,291	5,586	1,560	1,320	630	92,788	352,753	**997,466**
Coastal	0	0			0	0	0	0	0	0	0	**812,778**
Beverly Hills	34,075	17,781	$14,039	36,919	47,403	14,300	12,673	2,675	6,992	82,366	270,630	**623,340**
San Marino	0	0	$0	85	1,991	6,778	14,353	7,563	8,237	41,417	260,871	**371,307**
San Fernando	0	17,736	$9,636	1,990	937	8,454	1,073	520	1,243	16,002	87,342	**239,590**
Total	**10,531,848**	**15,413,456**	**18,099,490**	**36,201,044**	**24,800,506**	**16,086,419**	**12,862,935**	**11,979,368**	**18,647,960**	**130,696,110**	**182,157,854**	**657,926,688**

Attachment 10

SUPERIOR COURT OF CALIFORNIA

COUNTY OF SAN FRANCISCO

SAN DIEGO COUNTY WATER AUTHORITY, Plaintiff/Petitioner, vs. METROPOLITAN WATER DIST. OF SOUTHERN CALIFORNIA, et al. Defendants/Respondents.	Case No. CPF-10-510830 Case No. CPF-12-512466 STATEMENT OF DECISION ON RATE SETTING CHALLENGES

San Diego County Water Authority (San Diego) challenges the legality of four rates set by Metropolitan Water District of Southern California (Met).

San Diego alleges three defects. First, San Diego argues that Met improperly allocates the bulk of Met's costs under its contract with the California Department of Water Resources' State Water Project to the System Access Rate and the System Power Rate. Second, San Diego contends that Met illegally treats all of its costs for conservation and local water supply development programs as transportation costs by recovering them through the Water Stewardship Rate, which Met charges as a transportation rate. The asserted result of these

Summary of Arguments

San Diego argues that Met's System Access Rate, System Power Rate, Water Stewardship Rate, and wheeling rate are illegal and should be invalidated. San Diego Post-Trial Brief at 4. San Diego argues that (1) Met recovers the costs Met pays the SWP for transportation through its transportation rates without any basis for treating the SWP as its own conveyance system; and (2) Met charges its full Water Stewardship Rate in its wheeling rate even though the programs that are funded by the rate are primarily *supply* benefits. *Id.* at 3-4.

San Diego also contends that Met incurs dry-year peaking costs which benefit some member agencies (such as Los Angeles) which are recovered disproportionately from other member agencies (such as San Diego) through the transportation rates, among others. *Id.*

Met argues that it is reasonable to allocate SWP transportation costs to its transportation rates for four reasons: (1) SWP transportation costs are Met transportation costs;[67] (2) Met uses SWP facilities as an extension of its own system;[68] (3) Met has an integrated, regional system that delivers a blend of water which includes SWP water; and (4) Met's allocation is consistent with industry guidelines.[69] Met Closing Brief at 45-60. San Diego counters that the SWP costs are supply costs, i.e., costs incurred to obtain a supply of water. San Diego Post-Trial Brief at 20-25. San Diego accuses Met of improperly protecting member agencies that do not wheel water from facing increased rates when wheeling member agencies purchase water from other sources. *Id.* at 7.

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[67] Met relies on the facts that (1) its contract with the Department of Water Resources breaks down its charges to Met to reflect both costs associated with supply water and those associated with water delivery; and (2) it pays a share of the capital costs of expanding the SWP system in the reaches it uses. Met Post-Trial Brief, 45-49.
[68] Met relies on its contractual right to use SWP facilities to transport non-project water and the fact that it has exercised that right. Met Closing Brief, 49-53.
[69] Met points to the 1993 Raftelis textbook, the RMI reports, and the 2010 Raftelis report. Met Closing Brief, 55-59.

"reasonable basis" for the rates. *Inyo*. For reasons summarized just above, the latter, but not the former, rules apply here.

Summary. In sum, I conclude Proposition 26, the Wheeling statute, Govt. Code § 54999.7(a), and the common law (reasonable rates requirement) apply here. In each case the core inquiry is the same, and looks to cost causation, that is, whether the costs of the services (e.g. wheeling) are reasonably related to the costs of providing those services.

2. Analysis On The Merits

Setting aside San Diego's challenge to the dry year peaking (discussed below), I summarize the challenges to Met's rates, phrased as function of the cost causation principle: Is it reasonable for Met to include in its transportation rates (A) via the Systems Access Rate and the System Power Rate, the cost the state charges to Met to transport water to Met? (B) the Water Stewardship Rate?

I summarize here the basic guidance from the central cases. *MWD* tells us that the relevant costs may--or may not--be system-wide costs; but it is clear that I do not simply look to the marginal costs of providing e.g. wheeling services. (Had I done so, and because wheeling occurs solely when there is unused capacity, I might have concluded that aside from power and other costs required to literally move the wheeled water, no other costs could be included in wheeling rates.) *Morro Bay* reminds us that rates may not discourage wheeling, and loss of income attributable to lost water sales is not a permissible justification for [increasing] wheeling rates. *Palmdale* emphasizes cost causation, and bars unjustified price discrimination. *Griffith I* and *Griffith II* emphasize the rule that it is permissible to spread the costs of programs across all

rates. Met Closing Brief at 53. But this is no syllogism. While one can easily conclude from these predicates that all water-purchasing member agencies should pay some share of those SWP's costs—indeed, of all costs billed by the SWP to Met—it does not follow that a given portion of those costs (such as SWP's transportation constituent) ought to be billed to wheelers who happen to be member agencies. This is especially true as it appears that the water moved by the SWP system, even when it is not water purchased from the SWP, is nevertheless generally water which is sold by Met to its member agencies, *not wheeled water*.

The position Met takes here reflects its position on the core legal dispute presented by this case, and I turn to that more specifically now.

The Core Dispute. Met writes that, on the subject of system-wide costs such as (i) those paid for SWP's transportation of water and (ii) for programs funded by the water stewardship rates, "In 1997, MWD recognized that if it did not charge these costs to wheelers as well as its full-service customers, then its full-service customers would end up subsidizing the costs of wheeling transactions." Closing Brief at 6. Compare, e.g., *MWD v. IID*, 80 Cal.App.4th at 1432-33.

The core dispute is whether, under the current rate structure, wheelers are subsidizing water purchasers. San Diego says that wheelers such as itself subsidize the other member agencies. Under the wheeling statute, for example, that is not permitted because it would discourage wheeling, and under the balance of the statutes at play in this case wheelers would be paying more than a reasonable fee for the service.

This core dispute centers on the impact of the so-called San Pedro principles adopted in 1997, which San Diego characterizes as implementing an illegal rate stability plan and Met

capacity in the extant transportation system. Wheeling is "[s]ubject to the General Manager's determination of available system capacity." Admin. Code § 4405(a). And Met notes, "MWD also resolved that it would make the determination of whether there is unused capacity in its conveyance system (as required by the Wheeling Statue) on a 'case-by-case basis in response to particular requests for wheeling [services].' DTX-680 at AR2012-002450; JTX-1 AR2010-002450." Met Closing Brief at 20. While wheelers would benefit as a general matter by reason of increased capacity in that they might be able to wheel more water, those who in fact are permitted to wheel do so in a system built out to move non-wheeled water, that is, water that Met sells to its member agencies. Thus the costs and avoided costs attributable to the demand management programs relate to the transportation needs to provide purchased water. This too suggests that the cost of wheeling, while properly a function of system-wide costs associated with transportation as such, should not be a function of system-wide avoided costs of transporting purchased water.

C. Dry Year Peaking

San Diego alleges that costs attributable to dry year peaking are improperly part of the wheeling rate. Here's how San Diego phrases it:

> The dry-year peaking costs at issue here are those associated with purchasing and storing water and having capacity available in MWD's facilities to deliver water supplies to its member agencies when they "roll on" to MWD's system in dry years. For example, Los Angeles has a long history of rolling on and off the system, depending on the hydrological conditions in the Owens Valley where it obtains much of its water: between 2004 and 2009, Los Angeles's purchases from MWD swung from 367,000 acre-feet in 2004 to 208,000 acre-feet in 2006 and back up to 434,000 acre-feet in 2009
> San Diego's Amended Reply To MWD's First Pretrial Brief at 17.

It remains unclear exactly how these costs are part of the wheeling rate. Presumably some capital storage costs, some transportation costs, and some supply costs are part of what San Diego calls dry year peaking. *Cf.* San Diego's Post-Trial Brief at 30:20-28. Of course dry year

proposition did not seem to be seriously disputed, I have from time to time mentioned that evidence.

As to the standard of review, the higher de novo standard probably applies to Proposition 26, and under the Wheeling statute to the question of whether a rate might properly include a certain component. Under the Wheeling statue, the deferential standard applies to the issue of fair compensation, as it does to Govt. Code § 549997(a) and the common law's 'reasonable basis' standard.

But in this case, regardless of the standard, the result the same. There is no substantial evidence in the record to support Met's inclusion in its transportation rates, and hence in its wheeling rate, of 100% of (1) the sums it pays to the California Department of Water Resources' SWP disaggregated by the SWP as for transportation of that purchased water; and (2) the costs for conservation and local water supply development programs recovered through the Water Stewardship Rate. Indeed, the record confirms that these rates over-collect from wheelers, because at least a significant portion of these costs are attributable to supply, not transportation. These rates – the System Access Rate, System Power Rate, Water Stewardship Rate, and Met's wheeling rate – therefore violate Proposition 26 (2013-14 rates only), the Wheeling statute, Govt. Code § 549997(a), and the common law. The Court invalidates each rate for both the 2011-2012 and 2013-2014 rate cycles.

So too, under either the substantial deference or de novo standard, San Diego has not shown that there is a "dry year peaking" phenomenon for which Met's rates fail to fairly account. No violation of the pertinent law has been shown with respect to 'dry year peaking'.

Further Orders. San Diego has asked me to retain jurisdiction to ensure compliance with this ruling. At least until judgment is entered an appeal is taken, such an order does not appear