

# APPENDIX A

## Summary of key recommendations cited in this Report

### **Recommendation # 1 – Planning for increased development of Indirect Potable Water Reuse**

In anticipation of the successful completion of the recently approved and funded IPR demonstration project, MWWD in conjunction with SDWD should begin immediately the process of planning for the upgrade of the water treatment processes at the existing North City reclaimed wastewater production plant to full IPR status.<sup>1</sup> They should also begin planning for the development of additional IPR processing capacity at other locations as well as the construction of the pipeline to move the purified water to San Vicente Reservoir and/or other water storage facilities.

In Appendix O to this Report, we have provided a description of San Diego’s proposed Indirect Potable Water Reuse Demonstration Project, which we view as a critical step in moving San Diego towards partial water independence and greater local control over future water supply.

In making this recommendation, IROC does not intend to discourage further build out of the purple pipe system, provided that the all-in cost of such expansion, and other relevant factors, justify it. That said, IROC expects that IPR can be less expensive because, once processed, such purified water can be stored in existing reservoirs and then distributed via the existing water distribution system; there is no need to build a very costly, duplicate system of purple pipes and/or non potable water storage facilities.

To the extent that IPR can be scaled up to the current capacity of the North City recycling plant,<sup>2</sup> system ratepayers could be relieved of: (a) the cost of building and maintaining additional segments of the duplicate purple pipe distribution system; (b) the cost of discounting non-potable reclaimed water to a very limited group of reclaimed water users; (c) the stranded capital costs of the two plants to the extent of the unused portion of daily reclaimed water production currently returned to the wastewater system for final processing at Point Loma and discharge into the Pacific Ocean; and, (d) price and supply risks to the extent that IPR meaningfully reduces San Diego’s precarious dependence on imported water.

Additionally, a meaningful full-scale IPR program would reduce the volume of water handled by Pump Station 2 and the Point Loma Water Treatment Plant making compliance with the PLWTP Variance requirements less of a challenge. It also would produce other economic benefits for the ratepayers by the avoidance of future costs, for example, avoiding or significantly delaying a need to expand wastewater treatment capacity at Point Loma or Pump Station 2.

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<sup>1</sup> IROC understands that IPR opportunities at the existing South Bay plant are quite limited based on current flow and other factors.

<sup>2</sup> IROC does not exclude the possibility that additional flow could be directed to this plant, thereby increasing IPR capacity.

In the interim, we recommend that MWWD charge a smaller discount between the potable and the reclaimed water rates to both existing and any new reclaimed water users. We believe that maintaining a 60% to 70% discount for reclaimed water does not make economic sense for the overall system's ratepayers. We believe that a discount that is smaller than the current level should be charged to users of reclaimed water. As a benchmark, information on the website of Orange County's water authority (in August 2008) reported that this water agency charged its customers \$530 per acre-foot for imported raw water, and \$520 per acre-foot for reclaimed water (a discount of approximately 2 percent). IROC notes that the current pricing of reclaimed water has not been changed for several years, while the cost of potable water from which the reclaimed water is drawn and the cost of producing recycled water have increased considerably.

**Recommendation # 2 – A need for more effective communication of critical issues to educate ratepayers**

It is essential that San Diego water users be engaged, now, in a more comprehensive discussion of the challenges our community faces in terms of higher future imported water costs and of risks to supply. IROC recognizes that SDWD, Mayor Sanders and members of the City Council have made numerous attempts to convey the importance of water conservation and the risks associated with not meaningfully conserving water at the homeowner and business unit levels. That said, although these efforts are commendable and necessary, it is the actions of each San Diegan that will ultimately determine the extent of financial pain that will fall upon them as ratepayers. IROC believes that a stark disclosure to each ratepayer of the potential financial impact of a failure to adequately reduce water usage is necessary and has not been part of the water crisis discussions to date. This public discussion must take place well in advance of the imposition of any substantial increases in water rates, limits on supply, or imposition of any material penalties or fines for water use beyond to-be-established benchmark levels. San Diego's water ratepayers need to be informed of these risks, well in advance, so that they have the opportunity to reduce the potential impact of higher costs and/or reduced supply of water. In this way, if a meaningful percentage of the ratepayers actively participate in significantly reducing their water requirements, San Diego may be able to either avoid or otherwise minimize the imposition of these excess water-use penalty rates.

**Recommendation # 3 – Preparing alternatives to address the PLWTP Variance issue in the future**

IROC is confident that MWWD intends to fully comply with the recommendations that accompanied the December 2008 tentative decision to approve the Point Loma Wastewater Treatment Plant variance. In our view, MWWD should also take steps now to pursue all reasonable alternatives to ensure either the granting of future variances (which the recent tentative approval indicated should not be assumed or otherwise relied upon by MWWD) or to develop cost-rational alternatives to effectively meet the requirements currently waived under the terms of the five-year variance.

**Recommendation # 4 – Allocating additional resources to further reduce the potential occurrence of water or wastewater system breaks or spills**

Additional resources should be allocated by both SDWD and MWWD to reduce the cost of disruptions of service and untimely redirections of available resources arising from periodic occurrence of significant water or wastewater system leaks or failures. IROC recommends that a

greater level of resources be placed on the preventive maintenance of the system through video scanning, evaluating and as deemed necessary replacing portions of the systems' networks on a more frequent basis over a significantly greater percentage of miles of pipeline and mains than has been previously been feasible under either department's budgeted resources.

MWWD needs to continue its monitoring, cleaning, rehabilitation and replacement of portions of the sewer system on a priority basis to minimize the buildup of sewage items which create the conditions that lead to sewer spills. Additionally, MWWD needs to continue to work with all of its 15 participating wastewater agencies to ensure that all of its wastewater users are informed and educated about proper disposal of certain materials, for example greases and oils, that they might consider discharging into the wastewater system, whether residential or commercial, and which could be harmful to the wastewater treatment/conveyance process. Such materials are often a primary cost of wastewater spills.

IROC believes that the current pace of CCTV inspections (100 miles/year or roughly 3% of the overall wastewater system each year) and MWWD's annual schedule for replacements of aged portions of the network of collection system pipelines (currently in the 30 to 40 miles/year range or roughly a little more than 1% of the network's 3,000 miles of pipelines) needs to be accelerated and expanded. The concept of selectively assigning a designated annual number of miles of the system to be either examined or replaced, even when performed on a pre-determined priority basis, does not, unless significant in percentage, address the reality of the age versus the expected useful life of many portions of San Diego's Wastewater and Water systems. The fact that waterline breaks and sewer line spills periodically occur (even if much less frequently than in prior periods) causes us to be more pragmatic about whether the decline in these occurrences can be maintained or further improved upon without the benefit of video scanning, increased preventive maintenance or replacing a greater percentage of pipeline systems than occurred in Fiscal year 2008 or is presently funded in the departmental budgets for FY 2009.

Additionally, a summary of the overall economic costs of each distribution system failure should be collected and made available to decision makers and to system ratepayers and should be utilized to support the prioritization of capital improvement projects intended to specifically reduce distribution system failures in the future.

#### **Recommendation # 5 - Capital Improvement Project identification and optimization**

Both SDWD's and MWWD's respective lists of capital improvement projects yet to be accomplished is, at any point in time, extensive in both scope and number, while the available level of applicable resources (funding and staff) is limited by each entity's budgeted resources. We noted that numerous capital projects, which were expected to be either commenced or otherwise completed in FY 2008 by each Utility were either delayed by an absence of available resources or were superseded in priority by the need to reallocate such available resources to other more time-sensitive critically needed projects

At present, both SDWD's and MWWD's priorities are understandably driven by a combination of legal and regulatory requirements and, to a lesser extent, "fire fighting". IROC understands that the Departments do not have, and likely never will have, the freedom to invest without at least some revenue constraints, which can have the effect of accepting the risks of deferred maintenance and suboptimal rates of investment. Nevertheless, IROC believes that it is essential that the departments develop a revenue-unconstrained, risk-based investment plan, and update it

regularly. In the interest of transparency, IROC further recommends that the departments begin to fully fund a set of reserves based on the known and unknown risks to ratepayers posed by any deferred maintenance and suboptimal investment that is identified by this planning process.

**Recommendation # 6 – Improve analysis and planning of responses to system vulnerabilities**

Based on our discussions with Departmental Management the only assessment of water or wastewater risk and vulnerability that we are aware of is focused on the vulnerability to terrorism. It appears to IROC that a risk analysis that considers a broad range of risks should be conducted. This would allow decisions about the future of the San Diego's water and wastewater system to be made with the knowledge of system vulnerabilities and measures that could reduce those vulnerabilities. It should include the potential impacts of earthquakes, extreme storms, sea level rise, fires, equipment failures, accidental contamination, vandalism, internal sabotage, as well as terrorism.

**Recommendation # 7 – The use of rate structures to enforce water / wastewater conservation**

The current rate structures being used by the Departments appear to reasonably allocate costs among each utility's respective classes of ratepayers. However, the current water rate and sewer rate structures do not provide adequate incentives to those who practice significant water conservation and disincentives to those ratepayers who utilize water or produce wastewater at levels significantly above that of their ratepayer peers. An effectively designed rate structure should facilitate, promote and encourage water- wise consumption and wastewater re-use among all ratepayers.

**The following five recommendations are of lesser significance than the preceding seven items, however, IROC believes that each of the following merits active consideration by the Departments and by their policy makers.**

**Recommendation # 8 – Sub-metering of multi-family residential buildings**

Normally multifamily residential buildings have one water meter for many units. The cost of water is paid by the landlord out of the rent received or by a homeowners association from fees. Normally, the resident is not aware of the amount of water he/she uses, nor the cost of it, so effective water conservation is less likely. Installing a meter for each apartment (sub-metering) is more likely to help water conservation efforts. Sub-metering is costly to retrofit, but it is not costly for new construction. We urge that the City require sub-metering for all new units and encourage conversion to sub-metering when multifamily units are being remodeled or being converted to condominiums. IROC notes that there are commercial enterprises that offer these and related services directly to HOAs and building owners.

**Recommendation # 9 – Continued education and research regarding developing wastewater treatment technologies**

There are numerous promising technologies and advancements under development for wastewater treatment. To name a few, technologies such as membrane biological reactors (MBR), integrated fixed film/activated sludge (IFAS), and moving bed biological reactors (MBBR) allow larger volumes of water to be treated to high quality effluent standards in smaller footprint areas. We urge that such advanced treatment technologies continue to be followed in their maturation and potentially be considered for future treatment facilities and possibly for retrofits if appropriate. Technologies such as these may be particularly appropriate if the City of San Diego decides to upgrade to Secondary treatment of wastewater or for new water reclamation plants.

**Recommendation # 10 - Disposal of Biosolids**

The biosolid material left over from wastewater treatment has potential value. Currently its disposal is costly and can have negative environmental impacts, especially on water quality and from the fuel needed to transport it. We urge the City to aggressively seek ways to expand the beneficial use of biosolids in ways that do not have negative environmental impacts, and having the prospect of making a profit from it.

**Recommendation # 11 – Continued emphasis on green technology opportunities**

With regard to environmental issues we also recommend that both agencies in their pursuit of greater operational efficiencies should seek to adopt, implement or expand their use of, wherever cost affordable, renewable green technology opportunities such as solar, fuel cell, biosolids reuse, slug eaters, cogeneration, etc.

**Recommendation # 12 – Supplemental resources in support of IROC’s assigned responsibilities**

IROC’s ability to access external resources is currently funded at a de minimis level. Accordingly, IROC is not in a position to, if necessary, effectively supplement the personal time and efforts of its own non-paid members with the services of independent experts. We believe that this situation creates a potential risk that IROC is missing an opportunity to access a balance and range of essential viewpoints, analyses and potential alternative approaches that might be needed to better achieve IROC’s scope of responsibilities as defined in the City of San Diego’s Municipal Code.

## **APPENDIX B**

### **Comparative cost impediments to San Diego's water and wastewater systems**

#### **An absence of any material local sources of water, which results in San Diego's substantial dependency on purchases of imported water to meet customer daily water supply needs.**

San Diego's extensive reliance on imported water, which has existed for decades, enables others outside of our community's control to dictate both the cost and potentially the quantity and quality of water San Diegans can obtain. The risk of a limitation on the quantity of our water supply increases in times of water shortages experienced by either or both the Colorado River or the S-SJ Delta or when mandated by those authorized to control and allocate the distribution of such water to San Diego and hundreds of other communities in California and in the Southwestern United States.

San Diego's average daily level of water consumption and use was over 217 MGD in fiscal year 2008, of which roughly 90% was obtained through purchases of imported Colorado River and Sacramento-San Joaquin Delta (S-SJ Delta) water. This resulted in SDWD's purchase of approximately 71.5 billion gallons of imported water for use in San Diego during Fiscal Year 2008.

Effective January 1, 2009, in response to an increase in water charges established by the Metropolitan Water District of Southern California, the San Diego County Water Authority increased the cost to purchase untreated, raw water by 15.0% per acre-foot and the cost to purchase treated water by 12.0% per acre-foot. An acre-foot of water is equivalent to 325,851 gallons or 43,560 cubic feet of water. San Diego's periodic customer billing statements express water charges in terms of HCFs. An HFC is equal to 100 cubic feet of water. To illustrate the impact on San Diego's water ratepayers of this dependency, we compared the ratio of fiscal year 2008 water purchase-costs to water sales (billings) to ratepayers located in San Diego in comparison to water ratepayers located in Los Angeles.

In Los Angeles, fiscal year 2008 water sales totaled \$738 million and that city's related purchased water cost totaled \$183 million, or 24.8% of water sales. In San Diego, fiscal year 2008 water sales totaled \$291.6 million and the related purchased water cost was \$130.2 million, or 44.7% of water sales.

To illustrate the importance to operating cost efficiency comparisons of the difference in imported water dependency between San Diego and Los Angeles, the following information is provided on a per capita basis (using 2000 census data for both cities).

Los Angeles      San Diego

2000 Census Population Data	3,694,820	1,223,400
Total Water Billings	\$738 mln	\$292 mln
Cost of Imported Water	\$183 mln	\$130 mln
Implied other Water System Costs	\$555 mln	\$162 mln
Data on a per capita basis:		
Water billings	\$200	\$239
Cost of imported water	\$50	\$106
Other water system costs	\$150	\$133

From the above information it is clear to IROC that although San Diegans pay more for their water than those who live in the City of Los Angeles, the reason for the higher cost is fully attributable to San Diego’s greater dependence on imported water. On an operating cost basis (exclusive of the cost of imported water) San Diego’s ratepayers currently pay less for their water system than those who live in Los Angeles. As discussed in the next section, the Los Angeles water system has a system geographic distribution cost advantage over San Diego which should have resulted in Los Angeles’ “other water system costs” in the above table, on a per capita basis, being lower than San Diego.

A partial explanation of San Diego’s \$17 per capita advantage in “other water system costs” over Los Angeles is likely due to Los Angeles spending much more than San Diego on the capturing and reuse of water to reduce their dependence on imported water. IROC was not currently able to determine either the costs or the volume of water produced by such water reuse activities.

**The inherent cost of a proportionally larger system geographic size requirement, on a per capita basis, than other major water or wastewater systems in California and in the nation.**

This results from to a greater geographic dispersion of the customers being served by the system as expressed in terms of customer population density per square mile of service area.

Appendix C of this Report contains comparative analyses of the geographic footprint of San Diego’s water and wastewater systems versus the other members of the ten largest cities in California and the ten largest cities in the nation. These analyses disclose that San Diego, on a comparative basis, has a significant geographically-based disadvantage with regard to potential water and wastewater system operating efficiencies.

Appendix D of this Report provides a city-to-city comparison of our estimates of the water and sewer charges being billed to typical single family residential ratepayers in San Diego, Los Angeles and Phoenix. From these comparisons IROC believes that San Diego’s billings for water services in comparison to Los Angeles, given San Diego’s much higher reliance on imported water and significant population density disadvantage, appears to be surprisingly otherwise cost efficient for San Diego’s ratepayers. The comparison with Phoenix’s water and sewer rates was not as favorable. IROC believes that there are lessons that must be learned from a greater understanding of Phoenix’s water and wastewater situation and operational environment that may benefit San Diego’s ratepayers and policy makers. The scope of the performance of such a comparative city-to-city water & wastewater dialogue and review is beyond the resources of IROC, however, we would be pleased to review the results if and when they are developed.



**A competitive disadvantage in the terms of the water system's borrowing costs for funding multi-year infrastructure replacement, enhancement and expansion projects.**

San Diego's water system's senior bond credit rating, is currently set at AA- by Standard & Poor's (S&P), A1 by Moody's Investment Services (Moody's) and AA- by Fitch Ratings (Fitch). Other large peer cities have much higher credit ratings, and as a result have lower borrowing costs. For example, Phoenix is rate Aa1 by Moody's and AAA by S&P. Seattle is rated AAA by S&P, Boston is rated Aa1 by Moody's, Los Angeles is rated Aa2 by Moody's, while New York City, Chicago, Atlanta, Houston and San Francisco are each rated Aa3 by Moody's.

Currently San Diego's water system has roughly \$744 million of outstanding rated revenue bonds, state revolving fund (SRF) loans, and private placement notes secured by senior and subordinate liens on the system's net revenue. The water system's scheduled CIPs for fiscal years 2009 through 2112 total about \$611 million, with about 74% of such projected capital project expenditures related to a California Department of Health (DPH) compliance order to fund pipe replacement, improve treated water storage and water treatment facility upgrades.

**San Diego's wastewater/sewer system has two of the major comparative cost impediments noted for the city's water system: the inherent cost of a proportionally larger system geographic size requirement, on a per capita basis; and a competitive disadvantage in the terms of the wastewater/sewer system's borrowing costs for funding multi-year infrastructure replacement, enhancement and expansion projects.**

San Diego's wastewater/sewer system's bond credit rating, are currently set at A+ by S&P, A3 by Moody's and BBB+ by Fitch.

Currently San Diego's wastewater/sewer system has roughly \$1.2 billion of outstanding rated revenue bonds, state revolving fund (SRF) loans, and private placement notes secured by senior and subordinate liens on the system's net revenue. The wastewater system's scheduled CIPs for fiscal years 2009 through 2112 total about \$632 million, of which roughly 80% of such projected capital project expenditures are associated with the system's compliance with an Environmental Protection Agency issued consent decree.

In view of the significant amount of CIP project dollars required to be spent annually by SDWD and MWWD, even a few basis points of additional funding cost is meaningful to San Diego's ratepayers in comparison to similar water or wastewater CIP requirements incurred by ratepayers in other communities that have lower borrowing costs due to a better overall bond issuer credit rating. Unfortunately, at the current time, the comparative cost differential between San Diego and most other large cities, for example, the water and wastewater utilities in Phoenix, or Los Angeles, is much more than a few basis points of interest expense each year.

Given the unusually challenging overall global, national and local credit environments that exist for all types and forms of borrowers, near-term costs of credit (for everyone except perhaps the U.S. Federal Government) is likely to be both volatile and expensive. In addition, those borrowers with the highest credit ratings will have greater access to available funding than those perceived to be of higher credit risk, as expressed by their comparative credit ratings and by other factors considered by each lender.



## **APPENDIX C**

### **Analysis of the impact of San Diego's population density within its water and wastewater service areas in comparison to other cities in California and to other large U.S. cities.**

The geographic scope of service area coverage requirements for San Diego represent much more of an operational and cost efficiency challenge for San Diego's Water System than the applicable coverage requirements of similar utilities located in other California cities as well in a number of other large cities in the United States.

San Diego's wastewater system is similarly challenged in comparison to the applicable coverage requirements of similar utilities located in other California cities as well in a number of other large cities in the United States.

#### **How was such a determination made?**

The geographic density of population (and related housing density) (as measured in terms of the average number for each square mile of land service area) is materially different for both San Diego's Water and Wastewater Systems in comparison to the other nine largest cities in California.

The analyses that follow demonstrate that in all nine of our California city-to-city comparisons, San Diego's Water and Wastewater Systems require a much bigger geographic systems-footprint, on a per capita or per household basis, than any of the other California cities we compared San Diego with, simply because San Diego's customer base is more geographically disbursed than any of the other cities' populations.

In IROC's opinion, a community with an identical number of customers and properties served that could exist within a materially smaller geographically compact service area (due a higher per capita or property density per square land mile) would logically require a materially lesser amount of resources to maintain, operate, repair, replace or enhance either a water or sewer system.

The lower amounts of resource requirements would arise from a there being materially fewer miles of water or sewer system pipeline, which would in turn require fewer system pumping stations, which in turn would result in a much lower consumption of energy sources and related expense to move either water or sewage through the lesser number of miles of pipeline. Additionally, there would be a much lower number of fire hydrants required to be connected and serviced by the water system (due solely to there being a smaller geographic area requiring fire coverage) and lesser amounts of many other standard water or wastewater system components. Such a comparatively smaller sized water and wastewater system would logically have a smaller staffing requirement to operate, to maintain, to repair and to replace such a geographically smaller water or sewer system and would have either less frequent or smaller periodic distribution system capital project expenditures.

To illustrate this material geographic-footprint based operational efficiency challenge, we are providing the following information, all of which was obtained from the year 2000 census reported for each city.

## San Diego's population density compared to the ten largest cities in California

Municipality	Population (2000 Census Data)	2000 Land Area in Square Miles	Population Density per Square Mile
Los Angeles	3,694,820	469.1	7,876
<b>San Diego</b>	<b>1,223,400</b>	<b>324.4</b>	<b>3,772</b>
San Jose	894,943	174.9	5,118
San Francisco	776,733	46.7	16,633
Long Beach	461,522	50.4	9,149
Fresno	427,652	104.4	4,097
Sacramento	407,018	97.2	4,189
Oakland	399,484	56.1	7,126
Santa Ana	337,977	27.1	12,451
Anaheim	328,014	48.9	6,702

Projected of San Diego Distribution Pipeline size at other cities Population Density	Number of Miles for San Diego Water System Pipeline	Estimated Miles (A)	% Reduction
Los Angeles	3,320	1,590	52%
San Jose	3,320	2,447	26%
San Francisco	3,320	753	77%
Long Beach	3,320	1,369	59%
Fresno	3,320	3,057	8%
Sacramento	3,320	2,990	10%
Oakland	3,320	1,757	47%
Santa Ana	3,320	1,006	70%
Anaheim	3,320	1,869	44%

(A) This is the estimated number of water pipeline miles that would have been required in San Diego, if San Diego had the same level of population density as the other city.

Projected of San Diego Distribution Pipeline size at other cities Population Density	Number of Miles for San Diego Wastewater System Pipeline	Estimated Miles (B)	% Reduction
Los Angeles	3,000	1,437	52%
San Jose	3,000	2,211	26%
San Francisco	3,000	680	77%
Long Beach	3,000	1,237	59%
Fresno	3,000	2,762	8%
Sacramento	3,000	2,701	10%
Oakland	3,000	1,588	47%
Santa Ana	3,000	909	70%
Anaheim	3,000	1,688	44%

(B) This is the estimated number of wastewater pipeline miles that would have been required in San Diego, if San Diego had the same level of population density as the other city.

A population density-based requirement for a materially larger network of pipeline miles results in the incurrence, within San Diego, of proportionally greater pipeline system annual operating, maintenance and repair costs as well as greater and more frequent periodic capital project replacement expenditures on a per capita basis than any of the other nine California cities listed.

A material geographic distribution system disadvantage represents a significant challenge for both San Diego's Water and Wastewater Systems in any comparison of operational performance efficiencies with any of the other nine California cities.

IROC then compared as smaller sub-set of the California cities using housing density data reported for each city in the 2000 Census. We chose for comparison, a large metropolitan community, a medium-sized metropolitan community and a much smaller metropolitan community (Los Angeles, Long Beach and Santa Barbara).

**Housing density per square mile of land area (2000 Census)**

<b>San Diego</b>	<b>- 1,448 units</b>
<b>Los Angeles</b>	<b>- 2,852 units</b>
<b>Long Beach</b>	<b>- 3,403 units</b>
<b>Santa Barbara</b>	<b>- 1,953 units</b>

Using the same approach as was used in the preceding population density comparisons, the network of water and wastewater distribution system miles for San Diego, using the housing density levels for each of these other Southern California coastal communities would be as follows:

	Water System Miles	Wastewater System Miles
San Diego's existing system	3,320	3,000
At Los Angeles' housing density level	1,686	1,523
At Long Beach's housing density level	1,413	1,277
At Santa Barbara's housing density level	2,462	2,224

Not surprisingly, the comparative results using housing density were similar to the results produced using population density. Each of these other cities, on a per property basis, presently requires a materially lesser amount of water or sewer infrastructure to service a proportionally equivalent number of properties within their respective service areas, on a per capita basis.

IROC believes that the ratepayers and policy makers of San Diego should not ignore, dismiss or understate the significance of the material per capita effect, on both operating and capital project expenditures, of the portion of San Diego's water and wastewater costs that arise from the geographic dispersion of its customers. The concept of economies-of-scale does not apply when one needs to maintain, repair, clean and ultimately periodically replace over time every mile of piping within a water or wastewater system that is materially larger in scale on a per capita basis than those to which it may be compared to.

Appendix L of this Report contains further detailed 2000 Census data on San Diego, Los Angeles, Long Beach and Santa Barbara.

IROC also compared San Diego's geographic population density to the ten largest cities in the nation.

Municipality	State	Population (2000 Census Data)	2000 Land Area in Square Miles	Population Density per Square Mile
New York City	New York	8,008,278	303.3	26,401
Los Angeles	California	3,694,820	469.1	7,876
Chicago	Illinois	2,896,016	227.1	12,749
Houston	Texas	1,953,631	579.5	3,372
Philadelphia	Pennsylvania	1,517,550	135.1	11,233
Phoenix	Arizona	1,321,045	474.9	2,782
<b>San Diego</b>	<b>California</b>	<b>1,223,400</b>	<b>324.4</b>	<b>3,772</b>
Dallas	Texas	1,188,580	342.6	3,470
San Antonio	Texas	1,144,646	407.6	2,808
Detroit	Michigan	951,270	138.8	6,855

Projected of San Diego Distribution Pipeline size at other cities Population Density	Number of Miles for San Diego Water System Pipeline	Estimated Miles (C)	% Reduction
New York City	3,320	474	85.7%
Los Angeles	3,320	1,590	52.1%
Chicago	3,320	982	70.4%
Houston	3,320	3,714	<b>-11.9%</b> (D)
Philadelphia	3,320	1,115	66.4%
Phoenix	3,320	4,501	<b>-35.6%</b> (D)
Dallas	3,320	3,609	<b>-8.7%</b> (D)
San Antonio	3,320	4,460	<b>-34.3%</b> (D)
Detroit	3,320	1,827	45.0%

(C) This is the estimated number of water pipeline miles that would have been required in San Diego, if San Diego had the same level of population density as the other city.

(D) San Diego has a geographic population density advantage over each of these four cities. The relative advantage over Houston and Dallas is small in comparison to the advantage over Phoenix and San Antonio, or the size of the disadvantage when compared to New York, Los Angeles, Chicago, Philadelphia and Detroit.

Projected of San Diego Distribution Pipeline size at other cities Population Density	Number of Miles for San Diego Wastewater System Pipeline	Estimated Miles (E)	% Reduction
New York city	3,000	429	85.7%
Los Angeles	3,000	1,437	52.1%
Chicago	3,000	888	70.4%
Houston	3,000	3,356	<b>-11.9%</b> (F)
Philadelphia	3,000	1,007	66.4%
Phoenix	3,000	4,068	<b>-35.6%</b> (F)
Dallas	3,000	3,261	<b>-8.7%</b> (F)
San Antonio	3,000	4,030	<b>-34.3%</b> (F)
Detroit	3,000	1,651	45.0%

(E) This is the estimated number of wastewater pipeline miles that would have been required in San Diego, if San Diego had the same level of population density as the other city.

(F) San Diego has a geographic population density advantage over each of these four cities. The relative advantage over Houston and Dallas is small in comparison to the advantage over Phoenix and San Antonio, or the size of the disadvantage when compared to New York, Los Angeles, Chicago, Philadelphia and Detroit.

A population density-based requirement for a materially larger network of pipeline miles results in the incurrence of proportionally greater pipeline system annual operating, maintenance and

repair costs as well as greater and more frequent periodic capital project replacement expenditures on a per capita basis.

A material geographic distribution system disadvantage represents a significant challenge for any Water or Wastewater System in any comparison of operational performance efficiencies with other less challenged communities.

In addition to a population density caused geographic service area disadvantage that San Diego has in comparison to the older eastern cities (New York City, Chicago, Philadelphia and Detroit), none of these eastern cities is dependent on the purchase and importation of water from sources hundreds of miles away. Also, none of these cities is located in an arid region like San Diego, which receives minimal rain on an annual basis. These eastern cities usually experience much higher annual rain levels, which in turn help each of them to replenish their water storage reservoirs and water supply at a much lower cost than the costs paid by San Diego for imported water.



# APPENDIX D

## Comparison of San Diego’s water and sewer rates with Los Angeles and Phoenix

IROC then chose to compare one of the California cities which has a population density advantage over San Diego (Los Angeles) and one of the four national cities for which San Diego has a population density advantage (Phoenix) to specifically illustrate the resultant cost impact on the respective cities’ single family residential water system ratepayers and sewer system ratepayers.

For the purposes of comparison we assumed that the typical single family residential ratepayer used 14 Hundred Cubic Feet of Water (HCF) each month. One HCF is equal to approximately 748 gallons of water.

Based on residential water and sewer rate information obtained directly from each city’s Water and Sewer Utility websites, the following analysis was developed by IROC.

### A comparison of single family residential monthly water charges between Los Angeles and San Diego

The latest available Water Rate Information that we were able to obtain for the City of Los Angeles are as of November 1, 2008 (as currently published on the that city’s Water Utility’s website

In Los Angeles, the Monthly Base Service fee for a single family residential customer was set as follows (all amounts shown are in \$ per HCF):

	Jan to Mar.	Apr. to June	July to Sep.	Oct. to Dec.
First Tier Water Rates	\$2.722	\$2.782	\$2.976	\$2.971
Second Tier Water Rates*	N / D	N / D	\$3.536	\$3.168**
Surcharge for Service Outside of the City of L.A.	\$0.702	\$0.702	\$0.702	\$0.702

N / D = Not disclosed on the City of Los Angeles’ Web Site

\* (in Los Angeles, these Second tier Water Rates only apply to residences with lot areas less than 7,500 square feet that have water use beyond 26 HCF in a month (28 HCF in some L.A. zip codes) – So for purposes of comparison with San Diego, second tier rates are not applicable.

\*\* (An average of \$3.561 for Oct., \$2.971 for November and \$2.971 for December).

Los Angeles (In-city):

For each HCF of water used the following is charged:

	In-City (First Tier)	Outside LA (First Tier)
For the three months (January through March)	\$2.722	\$3.424
For the three months (April through June)	2.782	3.484
For the four months (July through September)	2.976	3.678
For the four months (October through December)	2.971	3.673
	-----	-----
Resulting annualized average	\$2.863	\$3.565
	=====	=====

Why does Los Angeles charge almost 25% more for water users designated as being outside the city than those it views as being within the City? We believe that such a differentiation is primarily the result of Los Angeles's realization that, as previously stated by us in this report, geographic footprint size does matter when it comes to the level of operating costs required to maintain either a Water or Wastewater System.

Using the annualized average cost per HCF of water, the average monthly water bill for a Los Angeles single family residential customer using the same monthly HCF volume of water observed in San Diego (14 HCF) results in a monthly water bill of \$40.08. This is the estimated total amount since Los Angeles has no fixed cost portion of charge in its monthly residential water billings.

A water bill for a San Diego single family residential customer as of November 1, 2008 would have been:

Base Service Fee for a ¾ inch water pipe and meter (prior to 1/1/2009)	\$16.32
Water Usage Fees (prior to 1/1/2009):	
Tier 1 usage – first 7 HCF of water used (7 x \$2.505 for each HCF) -	17.54
Tier 2 usage – the next 7 HCF of water used (7 x \$2.717 for each HCF) -	19.02
	-----
Estimated Monthly Water Bill prior to 1/1/2009	\$52.88
	=====

Clearly, a Los Angeles water ratepayer is receiving the pricing advantage of having a much more geographically concentrated water system on a per capita basis (7,877 people per square mile of land covered) than San Diego's water system (3,772 people per square mile of land covered). This 2.09 to 1 level of per capita density disadvantage is likely to ensure that Los Angeles water ratepayers should always have a significant system efficiency advantage over those in San Diego.

### **Comparison of Sewer Rates between San Diego and Los Angeles**

The monthly sewer rate for a San Diego single family residence, effective as of May 1, 2008 was \$10.14 for the base sewer access fee for the typical single-family residential customer with a sewer usage rate (service charge) of \$3.14 per HCF of estimated wastewater processed. These rates are after consideration of a current reduction of a super majority of most San Diegans sewer bills to reflect a reversal of certain sewer base access and service charge fees arising from a prior class action lawsuit settlement.

Los Angeles' bills its sewer customers on a basis of \$3.27 per HCF of metered discharged sewage for all customers of the City of Los Angeles' wastewater system. In addition, all customers are charges a low-income surcharge of roughly \$0.03 per HCF to supplement the cost of Los Angeles' sewer utility's provision of services to those sewer system ratepayers designated as being low-income customers. Los Angeles does not have a fixed rate charge for its providing of sewer services, accordingly, the monthly billing for sewer services is based on \$3.30 per HCF of metered discharged sewage.

Los Angeles does impose a 10% utility tax of the monthly combined amount of water, sewer and electric charges billed to each of its water, sewer and electric ratepayers.

Starting with the 14 HCF water volume level used in the preceding water systems comparison and assuming that approximately 64% of the water provided to a SFR customer is ultimately returned into the sewer system as wastewater requiring treatment and disposal, this results in an assumed monthly wastewater flow from a SFR customer of 9 HCF.

San Diego's typical average monthly sewer bill for a single family residential customer is estimated to be \$38.40 a month by San Diego's Metropolitan Wastewater Department. This amount was determined by adding San Diego's sewer base rate of \$10.14 (access charge) to a sewer usage charge of \$28.26 (\$3.14 per HCF x 9 HCF).

A similar sewer billing calculation for a Los Angeles Single Family Residence customer, using the same 9 HCF assumption would result in a sewer usage charge of \$29.70 (\$3.30 per HCF x 9 HCF) plus the addition of a 10% tax on this amount (in this case \$2.97) for a total average estimated SFR monthly bill of \$32.67.

As was the case in the prior water billing comparison, a Los Angeles sewer ratepayer is receiving the pricing advantage of having a much more geographically concentrated water system on a per capita basis (7,877 people per square mile of land covered) than San Diego's Water System (3,772 people per square mile of land covered). This 2.09 to 1 level of per capita density disadvantage is likely to ensure that Los Angeles water ratepayers should always have a significant cost of services advantage over those in San Diego. However, the estimated monthly dollar cost amount variance between equivalent wastewater volume sewer billings for a Los Angeles SFR and a San Diego SFR appears to be much less than one would have assumed given the substantial population density system advantage that Los Angeles enjoys over San Diego. Based on this analysis, it appears that San Diego's wastewater operations, exclusive of its geographic population density inefficiency, is operating at a lower cost per capita (based on billings for services provided) than Los Angeles' sewer utility.

### **A comparison of single family residential monthly water charges between Phoenix and San Diego**

As we previously noted, with the exception of Phoenix, AZ and the three Texas cities of Dallas, Houston and San Antonio, San Diego appears to have a material geographic population density disadvantage with respect to the required footprint size and resulting per capita operational expense level for both its water and sewer systems over other large cities in the United States.

Are the water and wastewater systems of the four cities to which San Diego has a population density advantage, operating as or materially more efficiently than San Diego? If so, are there reasons that explain or otherwise mitigate such differences?

In our opinion the most direct way to measure whether the Phoenix, Dallas, Houston or San Antonio Water or Sewer Systems are operating materially more efficiently than San Diego's it to compare the current cost of such services charged to the respective water and sewer ratepayers.

To test whether any one of these four cities may be operating its Water and Sewer Systems more efficiently, we chose to compare San Diego with Phoenix. Phoenix was chosen because its 2000 census population density of only 2,772 per square mile (as compared to Dallas at 3,470, Houston at 3,372, and San Antonio at 2,808), varied the most in percentage terms from San

Diego's 3,772. Phoenix is also the nearest of the four to San Diego and is also partially dependent on a common water source, the Colorado River.

### Comparison of Water Rates between San Diego and Phoenix

As previously disclosed in the prior comparison of San Diego versus Los Angeles water rates, a typical San Diego single family dwelling's monthly water bill (which assumed 14 HCF of water usage each month the water), as of November 1, 2008 was \$52.88.

For the purpose of comparison we assumed that a typical single family residence in Phoenix would also be expected to use 14 HCF (10,472 gallons) of water each month.

Here are the equivalent estimated monthly water bills for such similarly single family residential water users in Phoenix, based on that city's published water rate schedules.

The latest available Water and Sewer Rate Information that we were able to obtain for the City of Phoenix is as of March, 3 2008 (currently available on that city's Water and Waste Utilities' website). These rates would have also been in effect as of November 1, 2008.

A comparison of Phoenix's single family residential monthly water service fee to San Diego's estimated \$52.88 monthly water billing, as on November 1, 2008, for a single family residential customer follows.

In Phoenix, the monthly water service fee for a single family residential ¾ inch pipe and meter (similar to San Diego's) has both a fixed and a variable cost component. The monthly fixed component of the fee is set at \$4.73 for inside the city and \$7.10 outside the city. The variable component of Phoenix's water service fee varies seasonally with water volume usage. For 8 months of the year (from October through May) this charge level is applicable to only the excess of 6 HCF of monthly water usage and for 4 months of the year (from June through September) this charge level is applicable to only the excess of 10 HCF of water use.

Phoenix's water usage charges vary In-City and Out-of-City and also vary seasonally.

For each HCF of water used in Phoenix the following is charged:

	In-City	Out-of-City
For the four months (December through March) (*)	\$1.83	\$2.75
For the four months (Apr., May, Oct. & Nov.) (**)	2.20	3.30
For the four months (June through September) (***)	2.81	4.22
	-----	-----
Resulting annualized average	\$2.28	\$3.42
Plus a fixed monthly environmental charge for each HCF of water delivered to the customer	0.31	0.47
	-----	-----
Total HCF water charge for Phoenix	\$2.59	\$3.89

Using the above data for the typical Phoenix's single family residential customer results in the following estimated average monthly water service fee of \$22.97 for In-city and \$34.46 for Out-of-City.

	Phoenix (In-city)	Phoenix (Out-of-city)
Basic monthly water service fee	\$ 4.73	\$7.10
Monthly environmental charge for 14 HCF	3.72	5.64
Water Usage charge per HCF above the basic fee allowance:		
January – 14 HCF less 6 HCF x (*) / 12	1.22	1.83
February –14 HCF less 6 HCF x (*) / 12	1.22	1.83
March – 14 HCF less 6 HCF x (*) / 12	1.22	1.83
April- 14 HCF less 6 HCF x (**) / 12	1.47	2.20
May- 14 HCF less 6 HCF x (**) / 12	1.47	2.20
June- 14 HCF less 10 HCF x (***) / 12	0.94	1.40
July- 14 HCF less 10 HCF x (***) / 12	0.94	1.40
August- 14 HCF less 10 HCF x (***) / 12	0.94	1.40
September- 14 HCF less 10 HCF x (***) / 12	0.94	1.40
October- 14 HCF less 6 HCF x (**) / 12	1.47	2.20
November- 14 HCF less 6 HCF x (**) / 12	1.47	2.20
December- 14 HCF less 6 HCF x (*) / 12	1.22	1.83
Estimated average Phoenix SFR water bill	<u>\$22.97</u>	<u>\$34.46</u>

Why does the City of Phoenix charge approximately 50% more for water users designated as being outside the city than those it views as being within the City? We believe that such a differentiation is primarily the result of Phoenix’s realization that, as previously stated by us in this report, geographic footprint size does matter when it comes to the level of operating costs required to maintain either a water or wastewater system.

Why has Phoenix established such a seasonally detailed water usage rate schedule? Given the greater variance in temperature and climate that Phoenix experiences annually between its much cooler dryer winters and much dryer summers than we experience in the City of San Diego, Phoenix’s Water System’s daily production levels vary materially in comparison to San Diego’s. According to information obtained from Phoenix’s Water Utility’s website, the demand for potable water in Phoenix averages around 250 MGD. However, Phoenix’s average MGD of water demand ranges from a high of approximately 400 MGD in the summer to a low of approximately 175 MGD in the winter. In comparison, San Diego’s daily water demand of 217 MGD in fiscal year 2008 varied, but not to such an extreme, as the seasonal variances experienced by Phoenix.

The Water and Sewer Systems of Phoenix, in comparison to San Diego’s more varied terrain, operate on relatively flat or near flat terrain (in the Valley of the Sun). Accordingly, this represents a greater water movement expense challenge for San Diego

The variance in Phoenix’s water charges for Out-of-City residents, a 50% premium to the rates being paid by In-City residents, is clearly significant. Since much of the growth in Phoenix over the last few decades has occurred and is continuing to occur outside of what had been Phoenix’s traditional city limits, it was clearly a strategy for the Phoenix Water Department to make the newer sections of the overall Phoenix area pay for the new infrastructure and additional operating expenses incurred in bring these “outsiders” water.

San Diego's Water Department serves a population that lives primarily within its 324 square land miles of space. The similar significant expansion of people and developed communities that has occurred in San Diego over the same timeframe has occurred within the City. San Diego has never elected to differentiate water charges among any residents that reside or work in different areas of our city, whether newly built or previously established,

IROC believes that a fairer comparison between San Diego's and Phoenix's monthly SFR water billings is one that uses the average of Phoenix's In-city and Out-of-city SFR water billings. The resultant average bill of \$28.72 is still only 54% of the \$52.88 amount charged on San Diego's typical SFR monthly water bill. IROC believes that there are lessons that must be learned from a greater understanding of Phoenix's water situation and operational environment that will benefit San Diego's ratepayers and policy makers.

### **Comparison of Sewer Rates between San Diego and Phoenix**

The Monthly Sewer Rate for a San Diego single family residence, effective as of May 1, 2008 was \$10.14 for the base sewer access fee and a sewer usage rate (service charge) of \$3.14 per HCF of estimated wastewater processed. These rates are after consideration of a current reduction of a super majority of most San Diegans' sewer bills to reflect a reversal of certain sewer base access and service charge fees arising from a prior class action lawsuit settlement.

San Diego's typical average monthly sewer bill for a single family residential customer is estimated to be \$38.40 a month by San Diego's Metropolitan Wastewater Department.

A similar sewer billing calculation for a Phoenix Single Family Residence customer is a bit more complicated. A typical Phoenix homeowner's monthly bill is comprised of a number of elements. All of the following information is effective as of March 3, 2008 and was obtained from the Phoenix Sewer agency's website.

There is a monthly minimum sewer fee of \$4.50 (which we assumed is not applied to bills that arrive at a monthly sewer charge greater than \$4.50). There is a month sewer fixed charge of \$1.22 for each single family sewer account. Then there is a sewer service charge of \$1.962 per HCF (in-city) or \$3.011 per HCF (out-of-city) and finally there is an incremental environmental sewer charge of \$0.4621 per HCF (in-city) or \$0.6943 per HCF (out-of-city). The above listed series of fees and charges result in the following estimated sewer billings for residential single family households served by Phoenix's sewer system.

For In-City Residents:	
Monthly sewer fixed charge	\$ 1.22
Sewer service charge (\$1.962 x 9 HCF)	17.66
Environmental sewer charge (\$0.4621 x 9 HCF)	4.16
	-----
	\$23.04
	=====
For Out-of-City Residents:	
Monthly sewer fixed charge	\$ 1.22
Sewer service charge (\$3.011 x 9 HCF)	27.10
Environmental sewer charge (\$0.6943 x 9 HCF)	6.25
	-----
	\$34.57
	=====

As previously discussed in the comparison of water billings, IROC believes that a fairer comparison between San Diego's and Phoenix's monthly SFR sewer billings is one that uses the average of Phoenix's In-city and Out-of-city SFR sewer billings. The resultant average bill of \$28.80 is approximately 75% of San Diego's typical SFR monthly \$38.40 water bill.

IROC believes that there are lessons that must be learned from a greater understanding of Phoenix's wastewater situation and operational environment that will benefit San Diego's ratepayers and policy makers.

Phoenix's website indicates that the average monthly cost billed to its (In-city) residents for water and sewer services is approximately \$50 a month. In IROC's calculations of the typical Phoenix SFR monthly cost for water and wastewater we determined these amounts to be \$22.97 for water services and \$23.04 for wastewater services resulting in a combined total of \$46.01 a month. However, IROC was not able to specifically determine the average number of HCF's being used by an average Phoenix water/sewer customer. In our view, the \$4.00/month total variance could be due to a higher level of HCF water use/wastewater produced by a SFR customer in Phoenix due to that city's higher average annual temperature range. Otherwise, IROC is fairly confident in the validity of our preceding comparative analyses. As illustrated in the preceding analyses our estimate for the monthly water and wastewater service charges for an Out-of-city Phoenix ratepayer are \$34.46 for water, \$34.57 for sewer resulting in a combined billing of \$69.03 per month.

# APPENDIX E

## Three significant operational or system cost efficiency issues of concern

Although the operations and activities of SDWD and MWWD during Fiscal Year 2008 were determined to be both appropriate and prudent, IROC did note the following three significant operational or system cost efficiency issues of concern. Appropriate resolutions of these issues could provide opportunities for either an improvement in the overall quality of services being received or otherwise better control the overall cost of services being provided to water and/or sewer system ratepayers.

### A. Reclaimed water in San Diego - Current production versus use imbalance

A small percentage of the water used within San Diego comes from the production of reclaimed water, currently produced at a level of treated wastewater not intended for potable use (for human or animal consumption or for the irrigation of agricultural land used to grow food crops). The reclaimed water is produced by MWWD and sold to commercial customers in San Diego for lawn and landscaping irrigation and for other non-potable uses. Over 400 retail customers and three wholesale customers are connected to the City's reclaimed water distribution network.

San Diego's North City Water Reclamation Plant, which opened in 1997, was designed to produce a maximum capacity of 30 MGD of treated reclaimed wastewater. Currently the North City Plant is operating at a 22.5 MGD capacity of which 1MGD is utilized in internal plant operations. The current average customer demand for the plant's production runs between 1.5 MGD and 7.5 MGD. The fiscal year 2008 highest peak demand day for North City's production totaled approximately 12 MGD.

The city's South Bay Water Reclamation Plant, which opened in 2002, was designed to produce a maximum capacity of 15 MGD of treated reclaimed wastewater. Currently the South Bay Plant is operating at an 8.6 MGD capacity of which 1MGD is utilized in internal plant operations. The current average customer demand for the plant's production runs between 0.8 MGD and 6.2 MGD. The fiscal year 2008 highest peak demand day for South Bay's production totaled approximately 7.4 MGD.

The treated reclaimed wastewater is pumped from these plants to the existing reclaimed water customers by means of a secondary water delivery system marked by a distinctive network of purple colored pipes.

As a result of the absence of water storage facilities for reclaimed water and MWWD's inability to 1) attract sufficient voluntary users for the reclaimed water produced (even though such reclaimed water is currently priced at approximately 30% of the cost that would be charged for potable water for such users) and 2) fund over time a more extensive build-out of the purple-pipe distribution system from these plants to other potential customers, the portion of both plants' MGD production that is not delivered to meet current user demand is placed back into the wastewater flow for final treatment, processing and ultimate discharge into the Pacific Ocean.

The cost to expand the purple pipe distribution system from the existing plants to move the reclaimed water to new customers would, in IROC's judgment, be very cost inefficient for the



City's non-reclaimed water ratepayers, particularly given the current pricing policy for reclaimed water.

## **B. The potential for a material legally mandated future wastewater system inefficiency**

The potential risk of being legally mandated to modify San Diego's existing wastewater ocean outflow processing represents a pending future material inefficiency for MWWD and, as a result, a potentially significant future cost for our current and future wastewater ratepayers.

The City of San Diego's Point Loma Wastewater Treatment Plant (PLWTP) processes all of the sewage output of MWWD's wastewater system, which serves San Diego and 15 communities within San Diego County. The plant separates and cleans the output, so that the treated water portion of PLWTP's output can be safely discharged into the Pacific Ocean. PLWTP's remaining non-water sewage by-products are treated and processed for transport to landfills and other authorized disposal sites.

PLWTP's discharge of output into the Pacific Ocean is regulated by a combination of national, state and regional authorities. Currently PLWTP operates under a joint National Pollutant Discharge Elimination System (NPDES) Variance ("the Variance"). The Variance is actually a waiver of some of the requirements that would otherwise be imposed upon the ocean discharges of PLWTP by the National Clean Water Act.

The Variance, which is required to be evaluated for renewal every five years, is issued by the California Regional Water Quality Control Board, the San Diego Region's Regional Board and the U.S. Environmental Protection Agency. In December 2008, San Diego received a tentative decision to approve a five year extension of the PLWTP's Variance. However, with the approval came a subtle warning that San Diego should not expect to continue to receive such periodic extensions of the Variance in the future.

In the opinion of the City of San Diego and all of the other 14 communities that are members of MWWD's wastewater system, a future denial of the Variance's renewal, and the significant resulting compliance costs such denial would entail, would not meaningfully improve the Pacific Ocean's marine environment receiving PLWTP's ocean discharge output, as currently implemented under the existing Variance.

In the event that the Variance is, in the future, not renewed by the applicable regulatory authorities, the cost to the ratepayers of MWWD's wastewater system can be expected to be very significant. The cost of the project borrowings required to create a secondary treatment plant have been ranged hundred of millions of dollars to as high as \$1.5 billion dollars. If implemented, the project would result in additional ongoing annual operating and maintenance cost and related debt service costs (bond principal and interest repayments) that could cost San Diego's wastewater ratepayers several hundred million dollars annually.

In IROC's opinion, the value of what current and future wastewater ratepayers can expect to receive or gain by making the potential Variance-denial imposed changes to the existing wastewater ocean outflow process at the Point Loma Plant is likely to be very minimal in comparison to the related costs they would be required to assume. This view is shared by all of the administrations of the 15 communities that comprise MWWD's membership and by most, if not all, of the major independent environmental organizational groups that focus their attention

and efforts on protecting our local environment, including our precious coastal and ocean ecosystems. Can the operations at Point Loma be improved? There is always room for improvement; however, the rather expensive actions that would be required in the event of a denial of the Variance should not be on anyone's priority list for enhancing the Point Loma Plant's operations.

MWWD needs to comply with the recommendations that accompanied the December 2008 tentative decision to approve the Point Loma Wastewater Treatment Plant Variance. In our view, MWWD should begin soon to plan on using the next five years under the Variance to effectively pursue all reasonable alternatives to ensure either the granting of future Variances (which the recent tentative approval indicated should not be assumed or otherwise relied upon by MWWD) or to develop efficient alternatives to effectively meet the requirements currently waived under the terms of the existing Variance.

### **C. A need to continue to prioritize, control and fund the timing and completion of essential capital projects**

An exceptionally thorough level of monitoring and control of all existing or planned capital expenditure projects, given the severe economic challenges and uncertainties being faced locally, nationally and globally, has become more critical than ever before.

Both SDWD's and MWWD's respective lists of projects yet to be accomplished is, at any point in time, extensive in both scope and number of projects, while the available level of applicable resources (funding and staff) is limited by the reality of having to work within each entity's budgeted resources. Such resources come directly from payments made for services received by ratepayers. These resources are supplemented from time to time by periodic borrowing. The borrower funds are paid back over time through water and sewer billings paid by the ratepayers.

In our opinion, both agencies, during FY 2008, appear to have performed such monitoring and control over their respective capital expenditure projects in a controlled and prudent manner in line with their available resources. However, the reality of the financial consequences of significant delays in implementing important construction projects, including the resulting increases in potential construction costs and related debt service costs for such projects, could be material.

We noted that numerous capital projects, which were expected to be either commenced or otherwise completed in FY 2008 by each Utility were either delayed by an absence of available resources (principally funding and staffing resources) or were superseded in priority by the need to reallocate such available resources to other more time-sensitive critically needed projects. As a result, both agencies managed to operate within their respective expenditure budgets for FY 2008.

IROC believes that the short-term solution to this situation would have required an incurrence of additional capital and operational expenditures by both SDWD and MWWD during FY 2008 and would have necessitated both departments to seek additional funds directly from ratepayers or through additional borrowings (ultimately paid for by the ratepayers through subsequent payments of such borrowings periodic debt service expense).

The near-term operational and capital expenditure prospects for at least FY 2009 and FY 2010 appear similar for both agencies. One significant action being taken by both agencies is a

planned consolidation of certain generic organizational functions that are currently staffed separately by each utility. The removal of such redundancies and the resulting elimination of staff positions and others costs associated with such organizational duplications is intended to free up budget dollars for use on additional essential projects that otherwise would not be considered for either FY 2009 or FY 2010 without additional funding by ratepayers.

## APPENDIX F

### **Other comments on the operational efficiencies of San Diego's water and wastewater utilities**

At the present time, in addition to the previously discussed efforts to combine like functions within the Water and Wastewater agencies, there is an on-going city-wide functional review and centralization process. The potential impact of such city-wide activities on either SDWD or MWWD is not presently determinable.

Some may argue that what is necessary to achieve a more stringent reduction in the current operating expenses at either utility is a privatization of one or both utilities to introduce the potential for greater operating efficiencies in a corporate rather than governmental environment. Such considerations, to be valid, need to assume the existence of a material degree of waste or inefficiency within the existing organizations. We did not see any evidence of significant waste or material inefficiency in either agency. What we have observed are managements and staffs that are attempting to accomplish their missions and tasks in a prudent manner in the face of significant challenges combined with the need to nurture and oversee their existing level of resources frugally.

There is one significant departmental cost that would be adversely impacted in a privatization of either or both SDWD or MWWD. This matter would be significant to water and sewer ratepayers as all costs and associated profits of such a privatized water entity would ultimately be paid for by the affected ratepayers. A major inefficiency that would be inherent in a privatization would be having all capital projects funded through some form of corporate debt in lieu of municipally-backed borrowings, which traditionally have a meaningfully lower interest rate cost versus equivalently credit-rated corporate debt. Given the same revenue stream and operational risks a corporate waste or sewer entity is not likely to receive a higher credit rating than a municipal-owner water or sewer agency. The reason is primarily due to the historically lower default rate among municipal entities versus historical corporate entity default rates.

Unlike publicly-owned utilities, privately-owned utilities must pay owners a competitive rate of return on their investment. This additional operating margin would have to be achieved by some combination of higher rates and lower operating costs.

We understand that some ratepayers may believe that privatization of SDWD and MWWD would, at a minimum, have the benefit of eliminating the comparatively high cost of pension-related expenses being incurred by both utilities. Unfortunately, a significant portion of such costs appears to result from a need to fund, on a catch-up basis, prior period under-funding, and the prospective need to increase funding to compensate for the recent market decline. The reality is that, in the event that the utilities were sold to private owners, those owners would have to fully reimburse the City of San Diego for the net present value of all presently assumed current and future pension claims on the City's retirement funds that are expected to arise from prior years' service accrued by SDWD and MWWD retirees and current employees. In the opinion of IROC, such pension reimbursement costs would, in turn, need to be recouped by the new owners at least in part through higher rates.

Beyond these observations, IROC makes no assumptions about the costs and benefits of any potential privatization of either utility.

# APPENDIX G

## **Service Level Agreements (SLAs) entered into with other agencies and departments of the City of San Diego**

IROC reviewed the departmental expenditures of both San Diego's Water and MWW Departments including a review of all SLAs entered into with other departments or agencies of the City of San Diego. The annual expenditures of both Departments can be divided into two major categories: 1) normal operations and system maintenance expenditures; and 2) capital construction project expenditures covering major replacements of and extensions for Department's systems and operational network.

With regard to each Department's normal operations and system maintenance costs, some expenditures are directly under the control of the management of each Department, while some expenditures result solely from SLAs with other agencies within the City of San Diego. Such SLAs are individually negotiated with and then assigned by other respective city departments or agencies that have agreed to perform the work required on behalf of either the Water or MWW Department under specific SLAs. The terms of each SLA define a very specific level of resources to be purchased and also provide a very specific estimated cost for the resources to be provided by the responsible counter-parties to the SLAs.

The specific purpose of such SLAs is to create opportunities to lower the overall costs to those agencies purchasing SLA services from the counter-parties through the concept of economy-of-scale through consolidations of like functions. Such SLA generated costs are in lieu of a recipient department or agency's incurring such costs directly on its own through the maintaining of staff and other resources to accomplish the work covered under each of the SLAs.

For example, both San Diego's Water and MWW Departments purchase legal support from San Diego's City Attorney's office under an SLA rather than incurring the expense of creating and overseeing their own legal expertise by maintaining their own in-house legal staffs. Other city agencies provide similar level of expertise to The Water and MWW Departments under other individually negotiated SLAs. Another example are SLAs that exist with the City of San Diego's Treasurer's office which provides investment and funds management services in lieu of the Water and MWW Departments having to create and maintain their own investment advisory and funds management expertise and staffs.

In IROC's evaluation of the scope of services covered and the budgeted costs allocated to each of the numerous SLAs entered into between the Water and MWW Departments and other city departments and agencies, we did not note any material instances of unusual or unreasonable services being contracted for by either the Water or MWW Departments and the amounts established under these SLAs appeared reasonable in comparison to what the cost of such services would be if they had been performed by personnel employed solely by either the Water or MWW Departments. The scope of our review, which did cover all SLAs entered into by either the Water or MWW Departments, was not designed to audit or otherwise validate the dollars contracted for under these SLAs.

In the course of our review of these SLAs, we did consistently note a rather high employee benefit expense percentage allocation (in comparison to the applicable salaries expense allocations associated with such employee benefit expense) being charged by all city

departments and agencies providing services to SDWD or MWWD as well as similarly high employee benefit expense percentage allocations being charged to other city departments and agencies in those SLAs for which the other departments or agencies had contracted to pay for services being provided by either SDWD or MWWD.

We understand that the cause of such higher than expected employee benefit expense allocations are due to a need for the City to address major employee pension and other employee benefit funding shortfalls of prior years in addition to the normal level of employee benefit plan expense for the current year. The causes of such shortfalls have received extensive disclosure in the media since 2004 and are not arising from any areas under the control or scope of responsibility of either the SDWD or MWWD. Since the employees of both SDWD and MWWD are fully included in the City's historic and current employee benefit plans, such "catch-up" allocations would be applicable even if the employee-based work being covered under the SLAs was performed directly by persons hired to perform such work solely under the direction and control of either SDWD or MWWD.

# APPENDIX H

## **Dedicated Reserves for Efficiencies and Savings (DRES)**

IROC reviewed SDWD's and MWWD's DRES accounts which were established in Fiscal Year 2008.

We noted that the initial transfers of savings from Capital Improvement Projects (CIPs) being moved into the respective SDWD and MWWD DRES accounts were coming from CIPs approved, and in some instances commenced, prior to the establishment of the FY 2007 to FY 2010 (Wastewater System) and FY 2008 to FY 2011 (Water System) Rate Case increases. These Rate Cases were an underlying reason for the creation of the DRES accounts.

In IROC's opinion, such CIP savings should be transferred into the DRES accounts to provide an appropriate trail of accountability over the existence and subsequent use of such savings to augment the funding of future CIPs in lieu of obtaining an equivalent future amount of additional CIP funding from ratepayers.

We also noted that a significant number of SDWD and MWWD CIPs established within the above mentioned Rate Cases are now not expected to be completed within the originally determined Rate Case years. This in turn means that any DRES related transfers of potential savings to be realized (if any) from the specific Rate Case CIPs will in turn not occur until the currently deferred CIPs have been completed in a later year.

The existence of the DRES account represents an additional level of accounting control that IROC believes to be a meaningful improvement over SDWD and MWWD's previous reporting and applications of completed CIPs favorable variances (savings from incurring a lesser overall cost than the respective CIPs authorized funded amounts).

Previously, both SDWD and MWWD would apply a completed CIP project's savings directly against the funding requirements of one or more either previously unfunded or under-funded other, not necessarily related, CIP projects.

In our review of the DRES accounts of SDWD and MWWD we noted no exceptions in trail of accountability between the transfers-in of savings from completed CIP projects and no exceptions in the documentation of transfers-out of portions of the DRES account balances to other necessary CIP expenditures of either SDWD or MWWD. All transfers of funds out of either SDWD's or MWWD's DRES account specifically requires a review and pre-approval by IROC.

At the time of the completion of this Report, the CAFR report for the Fiscal Year ended June 30, 2008 was not expected to be released until the end of March 2009. This timing also impacted the finalization of the DRES account balances as of June 30, 2008 for both MWWD and SDWD. As a result, IROC has relied upon the currently available unaudited analyses and content of both utilities' DRES accounts at June 30, 2008, as reported to IROC. We will review and compare this information against the final June 30, 2008 DRES account activity and ending balances that will be based on the audited results of both utilities as part of IROC's review of the Fiscal Year 2009 operations and activities of both utilities.



# APPENDIX I

## **Review of reports and or commentary on SDWD and MWWD issued by external auditors and regulatory authorities**

IROC reviewed the most currently available reports from independent auditors with regard to FY 2008 rate and bond proceeds and expenditures. We also reviewed the most recently available CAFR (Comprehensive Annual Financial Report) Audit Report for FY 2007. The CAFR Report is prepared by an independent audit firm selected and evaluated by the City of San Diego's Audit Committee. The CAFR audit included the operations, activities and financial accounts of both SDWD and MWWD). Our purpose in reviewing the CAFR Report was to review and evaluate any specific audit findings, recommendations or commentary on either SDWD or MWWD.

### **Other reports reviewed by IROC which cover MWWD operations and activities:**

Annual External Audit – Exhibit E (FY 2007), prepared by an independent auditor on behalf of the 14 non-City of San Diego member wastewater agencies served by MWWD

Annual Bid to Goal Verification Audit (FY 2007)

### **Other reports reviewed by IROC which cover SDWD operations and activities:**

Reclaimed Water Audit by the San Diego County Water Authority and the Metropolitan Water District of Southern California (FY 2007)

Annual Bid to Goal Verification Audit (FY 2007)

There have not been separate entity-specific annual financial audits of either SDWD or MWWD for many years. In IROC's opinion, the reestablishment of such stand-alone financial audits for these utilities (which are not currently required of either SDWD or MWWD by the National Bond Rating Agencies, S&P and Moody's, or by any existing bondholder agreements) would add a significant additional annual administrative cost payable by water and wastewater ratepayers and may not provide an offsetting benefit beyond the audit coverage of SDWD and MWWD currently addressed in the annual CAFR audit.

At the time of the completion of this Report, the CAFR report for the Fiscal Year ended June 30, 2008 was not expected to be released until the end of March 2009. This timing also impacted the estimated completion dates for the Annual Bid to Goal Verification Audits of both MWWD and SDWD as well as the Annual External Audit – Exhibit E report on MWWD. As a result, IROC has relied upon the currently available unaudited analyses and content of both utilities' financial accounts and balances at June 30, 2008, as reported to IROC. We will review and compare this information against the final June 30, 2008 account activity and ending balances that will be based on the audited results of both utilities as part of IROC's review of the Fiscal Year 2009 operations and activities of both utilities.

# APPENDIX J

## Review of SDWD’s and MWWD’s respective water and sewer rate structures

The reasonableness and affordability of water and sewer system costs charged to the respective system’s ratepayers is influenced not only by the system’s day-to-day operational and maintenance costs, but also by the rising cost of San Diego’s dependence (approximately 90% of our daily water supply) on purchases of water imported from the Colorado River and the S-SJ Delta; the need to expand, replace and/or periodically enhance portions of aging water and wastewater processing and delivery systems; and from the cost of debt service on borrowings incurred on behalf of the water and wastewater systems over the years and to be incurred in future periods specifically to fund essential construction projects relating to the expansion, replacement and/or necessary enhancement of portions of both systems.

City of San Diego sewer rate structure as of January 1, 2009 is as follows:

User Type	Base Sewer Rate Flat Fee	Sewer Usage Charge \$ per HCF
Single Family Residential (Eligible)	\$10.14	\$3.14
Single Family Residential (Non-eligible)	\$14.22	\$3.34
Multi-Family Residential	\$14.22	\$4.66
Commercial and Industrial *	\$14.22	\$3.49
* ( COD \$/lb - \$0.21 & TSS \$/lb - \$0.51)		

City of San Diego’s water rate structure as of January 1, 2009 is as follows:

User Type	Water Charge \$ per HCF
Single Family Residential	1-7 HCF 2.795
Single Family Residential	7-14 HCF 3.032
Single Family Residential	14 + HCF 3.404
Multi-Family Residential	each HCF 3.032
Commercial and Industrial	each HCF 2.908
Irrigation & Temporary Construction	each HCF 3.107

In addition to the above water usage charges, each San Diego water system ratepayer is charged a fixed monthly fee based on the size of the water pipe connection to their respective properties.

*NOTE: HCF = hundred cubic feet of water provided (a measure equivalent to 748 gallons of water).*

The typical San Diego single family residential ratepayer uses an average of 14 HCF each month. This results in a composite cost of \$2.913 per HCF each month. San Diego’s current water rate structure appears to be equitable, as no class or user type of ratepayer is paying materially more for water use than any other ratepayer. For example, the difference between the composite average cost per HCF for a single family residential account (SFR) and a commercial or industrial account is less ½ cent per HCF; while the multi-family residential \$ per HCF rate is set at the same level as the SFR tier 2 rate level (7-14 HCF). This approach makes sense in view of the fact that although the actual water usage by the average multifamily residence is always likely to be well in excess of that of the average for a SFR, one needs to view such multi-family residences individually as concentrated collections of SFRs. Accordingly, using the SFR tier 2 rate level appears to be a rational way of addressing this view.

However, in IROC's opinion, the current water rate and sewer rate structures do not adequately provide incentives to those who practice significant water conservation and disincentives to those ratepayers who utilize water or produce wastewater at levels significantly more than their ratepayer peers.

One particular area of concern for the commercial and industrial ratepayers is "process water," which can be understood as being different from residential water use, in the sense that demand is less easily adjusted in the short run. IROC expects that industrial facilities, in particular, already recognize water as a cost of doing business and have an incentive to use water in the amounts needed -- and not more -- to make their products. However, IROC expects that most San Diego households are similarly sensitive to the cost of water.

Process water is water that is integral to the production or delivery of goods or services by industrial water users and is necessary to conduct business. Process water is also necessary in order for buildings to operate and people to work in buildings, including the heating and air conditioning systems, primarily through cooling towers which induce evaporation and have intentional draining-off of treated water (blow-down) to reduce chemical deposits. Likewise, potable water for restrooms, break rooms, and cafeterias is necessary to support personnel working in these facilities. For these reasons, in the short run and in the absence of readily-available technological solutions, demand for process water might be considered to be less easily adjusted in response to price shocks than is residential water used for such "optional" uses as irrigation.

Although it is likely that profit-oriented business users operate such facilities at the minimum water requirements for their operations, IROC does not believe that it is reasonable to simply assume that any further reductions in water supply would jeopardize business processes, health and safety, sanitation and quality of food. Therefore, while IROC would not reject out of hand the proposition that process water should be exempt from use restrictions and disincentives, neither would IROC assume that users of process water are not able to find ways to reduce such use.

### **Potential for enhancement of San Diego's Water and Wastewater Rate Structures**

IROC believes that well-designed water and sewer rate billing structures should provide improved equality among customer classes (single family residential properties, multi-family properties, small commercial, large commercial, governmental and public space and other irrigation users) as well as between customers within a class. In addition, the fixed and variable cost components incurred in the acquisition, processing and delivery of water services within the community need to be reflected in the rate structure's design to ensure: a) an adequate and reasonable level of water system revenue to meet all necessary water system operating and maintenance expenditures and capital project funding requirements including existing and anticipated water system debt service obligations; and b) provide a reasonable opportunity for each ratepayer to affect their specific water and sewer bills through changes in their individual water usage and wastewater creation patterns.

A well-designed water and sewer rate billing structure should permit policy makers to focus on maintaining affordability, stability, and simplicity for at least the base level of water to be supplied to each class of Water System customers and to promote an efficient use of the water supplied and wastewater processed.

We believe, that in addition to further educating the citizens of San Diego in ways that they can help themselves and their fellow citizens to become more efficient in water use, there needs to be a better approach to water and wastewater billing design to enforce, more effectively, each ratepayer's role in eliminating non-critical, less-essential and wasted water use.

Why should we allow water that is used for non-personal use (such as for landscaping of a residential property or a golf course, to wash the family car or to periodically clean sidewalks, driveways or streets) to be billed at the same water rate charged for personal uses like personal consumption and personal hygiene? In a time when water is likely to be either no longer as plentiful or is becoming more expensive to obtain, the answer is that we should not.

One approach to address this issue, would be to establish for each household and business ratepayer a per capita-based benchmarked volume of water sufficient to address, within a reasonable range, the volume of water estimated to be required specifically for personal use.

For example, establish a benchmarked daily average volume level (based on available data from a number of personal water use research studies that have been developed over the years) for each residence. The variation between residences will be solely based on the number of people living in each residence. The per capita determined benchmarked volume requirement would cover an estimate for daily water use for personal consumption, personal hygiene (including showers, baths, toilets, bathroom sink use, etc.) and for all other reasonable personal requirements (food preparation, dish washing, clothes washing, household cleaning, pets etc.). This level could be designated as a per capita "life-line" volume of water use.

A similar generic per capita based benchmarked water volume level would also be established for all non-residential water ratepayers.

The to-be-determined life-line volume would be priced on a monthly basis at the lowest water rate level feasible, taking into consideration the need to cover all water system costs by ratepayers. With such a life-line rate and volume in place, by deduction the remainder of water used reported for each water ratepayer would be determined to be for non-personal use and priced accordingly on a progressive rate basis. The more non-personal water used by a ratepayer, the more expensive each additional HCF of monthly water use should be.

Any water fee revenues created beyond the level originally determined to be required to fund the Water Department's current fiscal year operations should be moved into a reserve-for-contingencies fund and subsequently utilized solely to fund unanticipated water system requirements in future periods, thereby reducing the need to seek special assessments to otherwise meet such unanticipated items.

We believe that each person living and working in San Diego needs to be provided a reasonable supply of water for personal use at a price that is reasonably affordable. However, we believe that beyond such a basic level of allocated water use, each citizen should have the right to purchase additional water, if available, at rates appropriate to cover all costs of obtaining, processing and transporting the water to such supplemental purchasers. Such additional purchases of water need to be priced so that there is an economic incentive to be water-wise at whatever the water-needs may be. We believe the best way to provide such incentives is to establish water and wastewater conservation oriented tiered-pricing for water use and wastewater

produced, benchmarked at designated volume ranges of monthly water usage or estimated wastewater produced.

In the City of San Diego and in the County of San Diego, commercial and industrial water users' rates are based on "bulk" purchases (at flat block rates). In times of water challenges like the period San Diego faces today, the concept of volume of water priced at a flat rate structure for water use to any user or group of users needs to be discarded and replaced with a structure that increases the cost of the water as the water volume level increases.

Pre-existing legal agreements that pertain to significant commitments to supply a designated material amount of water to any user or user group at a pre-established price or set of prices, should be identified and aggressively challenged. Such agreements provide no clear economic incentives for the affected customers to conserve or otherwise reduce their water use through investment of their time or monies in more water efficient approaches or techniques. In the event of a water emergency declaration by the State of California, the County of San Diego or the City of San Diego, such pre-existing legal agreements should be terminated.

We firmly believe that the best approach to promoting water conservation in San Diego is one based on reducing water waste through greater water use efficiencies, not one based on imposition of significant restrictions on use.

An effectively designed rate structure should facilitate, promote and encourage water-wise consumption and wastewater re-use among all ratepayers.

In terms of water conservation activities in periods when water is not likely to be plentiful, the overall size of a non-agricultural plot of land that requires periodic watering matters. The larger the irrigation footprint the higher the irrigation water rate level should be. Someone with a 6,000 square foot lawn should pay a higher volume rate than someone with a 2,000 square foot lawn.

IROC believes that both water and sewer rates should be structured on a variable (use based – volumetric rate design) structure in a manner sufficient to address all of the water utilities' fixed and variable costs including system reserves for emergencies and other contingencies. The only exception might be a minimum usage charge, if a customer uses little or no water in the billing period – to reflect the cost of the water service being made available for use. This basic rate level could be established as the rate assigned to persons and families designated as low-income customers (a form of life-line rate).

Some water system customers are in designated irrigation accounts that allow them to bypass sewer charges because the water they use is supposedly exclusively for irrigation and thus, arguably, will not enter the sewer system, and accordingly are not required to pay sewer system rates. However, if these customers are using potable water for irrigation (rather than reclaimed water), they should be subjected to a progressively tiered water use rate structure to provide them with a meaningful economic incentive to seek treated reclaimed water for their irrigation requirements.

All new development or expansion of existing commercial, industrial and residential properties should be required to purchase water credits that will offset the additional water consumption or use caused by the proposed expansion.

One additional recommendation that should be considered is that water customers who require significant peak day water or wastewater demand should be allocated a water or wastewater rate charge that appropriately addresses the Water or Wastewater System's incremental cost of providing the increased volume of service during such peak times.

# APPENDIX K

## **A significant need to increase water conservation efforts**

No one knows when the current water supply challenge will abate; however, the more San Diegans who take the time to follow water-wise practices, the less likely will be the necessity for governmental authorities at the State, County or City level to impose long-term mandatory water use restrictions and possibly water rationing.

Some will say that the best answer to the pending water supply challenge is simple: we all need to use less water. In our view, a community can reasonably expect its water users to cut back or otherwise eliminate non-essential and inefficient uses of water. No one has the right to overuse, abuse, waste or pollute our essential water resources.

Each San Diego water system consumer needs to be a primary agent of change by taking personal responsibility for the reduction of his or her own water demand. SDWD's role in water conservation efforts is limited to 1) taking whatever measures are available to educate all of its customers in the need for and in the knowledge of all available means and techniques that can be utilized by its customers to increase their collective water conservation expertise and success, and 2) differentiating the value of water conservation from the cost of water waste by providing clear economic incentives in the design and enforcement of an easy-to-understand water rate usage structure that rewards reductions of water use and penalizes (by means of significantly higher water usage rates) those who use water significantly beyond the average of their rate class peer group.

San Diego's water future depends on the willingness of San Diego's citizens to adopt an ethic of water sustainability primarily through the development of additional sources of water, along with a firm and comprehensive commitment to water conservation actions, including much greater reliance on the recycling of existing water resources.

Increased water conservation, although essential, is not by itself enough to resolve likely future water demand versus supply imbalances. In our opinion, the use of voluntary efforts (a reasonable first step) or even mandatory restrictions to reduce water demand, may not be the most effective way of promoting a successful community-wide focus on permanent sustainable water-wise usage and reduced demand.

Historically, with the benefit of the experiences of many other communities, including the San Diego County Water Authority's promotion of the "20 Gallon a Day Challenge," voluntary conservation measures, though helpful, are typically not participated in at a level of community involvement sufficient to provide sustainable water conservation that we believe will be necessary going forward.

Personal habits developed over time, including inefficient use of potable water, are not easily reversed without some adequate level of water-wise education combined with positive and possibly negative reinforcements.

With regard to the potential for imposition of mandatory restrictions on water use, we believe these types of measures are best used for short-term emergency situations. Such mandatory restrictions on water are intended to have a material rather than minor impact on water use. The

imposition of any form of severe water use restrictions, potentially on a long-term basis (which might be required given the fact that San Diego's two major sources of imported water are severely challenged), would have a profound negative impact on the quality of life and the overall regional economy, therefore, impacting all who reside, work or visit San Diego.

San Diego's economy depends and thrives on tourism revenues, employment growth and net new residential growth. These elements are in turn drawn here by the perception of San Diego as being an ideal place to visit, live and work. What level of damage would a mandatory imposition of long-term significant water use restrictions do to the attractiveness of what we like to call "America's Finest City"?



# APPENDIX L

## **Comparative Analysis of average household water use in San Diego versus three other Southern California coastal communities**

The following is an analysis of water use in San Diego in comparison to three other California coastal cities. In this analysis we have selected a large city (Los Angeles), a medium sized city (Long Beach) and a small city (Santa Barbara) for comparison to San Diego.

If one were to use the average estimated water processed daily by the San Diego Water Department (217 MGD) and the estimated number of people served by the Department (1.3 million) the result would be a statistical average of roughly 165 gallons of water used by each person in the City of San Diego. Of course, the 217 MGD represents water used for all purposes (personal consumption, outdoor irrigation use, industrial & commercial use, and other non-personal applications of water). Refining this type of information by separating household water use (given the supermajority of household ratepayers in the system in comparison to all other types of water system customers) and then determining average daily water use per household could provide meaningful information on the relative efficiency or inefficiency of the average San Diego household compared to other communities.

In a comparative study contained in an article published in the summer 2008 edition of Waterkeeper Magazine (authored by Bruce Reznik, Executive Director of San Diego Coastkeeper) San Diego's per household water usage was reported as being 173 gallons per day. The article went on to point out that this quantity of household water use appears to be much higher in comparison to other coastal cities in Southern California. For example, Los Angeles' household average water use was cited as being 141 gallons/day, Long Beach's household average water use was indicated as being 121 gallons/day as was Santa Barbara's household average water use. Perhaps there are circumstances that can and would otherwise narrow the indicated variances among these cities' household average daily water use statistics; however, it does appear that this comparison indicates that San Diego's level of water use needs to be challenged and where possible reduced.

The 2000 Census reported that there were approximately 450,000 households within the City of San Diego. This number is likely to have increased since then. However, using the 450,000 number, if each San Diego household were to actually be using 32 gallons of water daily more than the average Southern California Household (using Los Angeles' household average as a benchmark - roughly the midpoint of usage amount the four cities measured in the above comparison), collectively that would amount to an annual total variance of (32 gallons x 365 days x 450,000 households) 5.256 billion gallons of additional water use each year than would be used by an equivalent number of households in Los Angeles.

The 5,256 billion gallons represents an amount equal to over 14.4 MGD or 6.6% of the total amount of water supplied for all purposes to all customers by the San Diego Water Department each day (217 MGD). Almost seven percent may not sound significant; however, given the current water demand/supply circumstances, such an amount of potential excess water use should be allowed to continue unchallenged..

**The following information was obtained from the 2000 Census data, as reported for each of the following four cities.**

**2000 Census for San Diego**

Total population – 1,223,400  
Total population in households – 1,177,582  
Total number of population in group quarters 45,818  
Total number of households – 450,691  
Average household size – 2.61  
Total number of residential housing units – 469,689 (18,998 vacant)  
Total land-only area – 324 square miles  
Population density per square mile – 3,772  
Housing density per square mile – 1,448 units

**2000 Census for Los Angeles**

Total population – 3,694,820  
Total population in households – 3,612,223  
Total number of population in group quarters 82,597  
Total number of households – 1,275,412  
Average household size – 2.83  
Total number of residential housing units – 1,337,706 (62,294 vacant)  
Total land-only area – 469 square miles  
Population density per square mile – 7,877  
Housing density per square mile – 2,852 units

**2000 Census for Long Beach**

Total population – 461,522  
Total population in households – 451,341  
Total number of population in group quarters 10,181  
Total number of households – 163,088  
Average household size – 2.77  
Total number of residential housing units – 171,632 (8,544 vacant)  
Total land-only area – 50 square miles  
Population density per square mile – 9,150  
Housing density per square mile – 3,403 units

**2000 Census for Santa Barbara**

Total population – 92,325  
Total population in households – 89,508  
Total number of population in group quarters 2,817  
Total number of households – 35,167  
Average household size – 2.55  
Total number of residential housing units – 37,076 (1,909 vacant)  
Total land-only area – 19 square miles  
Population density per square mile – 4,865  
Housing density per square mile – 1,953 units

# APPENDIX M

## **What can San Diegans do now to reduce the impact of a potential water crisis?**

In seeking ways to reduce the overuse, abuse or waste of our existing water supply, we all need to determine how, when, why, by whom and in what amounts water is being used today.

Several detailed water use studies have been made over the years that cover a number of communities in America. While the information for such studies is illuminating, the fact remains that individual water users have developed their own patterns of water use. If, as a community, we really want to make a difference in reducing the level of water being overused, abused or wasted, we need to communicate and educate all members of our community in the need for and techniques to accomplish a wiser use of our available water supply here in San Diego.

## **The role of lawn and landscape watering in our overall use of potable water**

All of the water-use studies have indicated something that we all observe every day. The biggest single use of potable water in our community is the portion we allocate to the watering of landscaping and lawns.

The San Diego County Water Authority estimates that approximately 50% of residential water consumption is used for the outside irrigation of plants and lawns. It also estimates that at least 50% of a typical residential home's water consumption can be saved by planting a more native landscape. Native plants, shrubs, trees and ground cover require much less watering, lower maintenance and require little to no fertilizer, pesticides or pruning.

The frequency of the number of days in each week that plants, trees and ground cover require watering varies based on each specific location's expected weather and temperature and varies with the seasons of the year. Landscaping within coastal locations with cooler temperatures will require fewer days per week of watering than landscaping within inland locations that have arid and warmer temperatures. Additional watering is required more often in the hotter summer months than in the cool to colder winter months.

With regard to taking actions to help reduce overuse, abuse or waste of potable water used in the watering of lawns and landscaping, we have the following recommendations:

Each San Diegan should make every effort to reduce the volume, frequency and duration of lawn and landscape watering of residential, commercial and public properties spaces by performing the following actions.

1. Reassessing lawn and landscape irrigation volume, frequency and duration requirements at least on a seasonal basis. By taking this action, water can be saved; water bills can be reduced, and the potential for prematurely killing off plants and flowers by over watering can be avoided.
2. Adjusting irrigation systems to reduce the potential for occurrences of excessive water runoff or drainage onto pavements, driveways and into street and sewers, and avoiding sprinkler overspray onto areas not requiring water. The occurrences of excess drainage runoff and area overspray represent a clear waste of potable water. These actions could save up to 500 gallons of water each month – (Source a publication by the San Diego Coastkeeper).

3. Periodically checking and testing irrigation systems for leaks, as these can become major water wasters.
4. Discontinuing or severely limiting the use of potable water to wash down sidewalks, driveways, portions of streets and portions of garden areas that do not require watering. Broom cleaning these areas is an alternative. Avoiding the use of water to accomplish these actions can save up to 150 gallons of water each time a broom is used instead of a hose to clean such areas. – (Source, a publication of the San Diego Coastkeeper).
5. Scheduling lawn and landscape watering to occur early in the morning or in the evening to conserve water by reducing the level of surface water evaporation, which increases when water is exposed to sunlight. This could save each homeowner 25 gallons of water each day a lawn or landscape is watered. – (Source publication by the San Diego Coastkeeper)
6. Monitoring the schedule of lawn and landscape watering closely when it rains. No one wants to see water being wasted by a sprinkler system immediately before, during or after a rainy day.
7. All existing and proposed outdoor fountains, whether located on public or private properties should be required by law to use some form of reclaimed water. Those that currently are not designed to recycle the water they are using should either be modified to permit such recycling or should be replaced or permanently turned off.
8. If economically feasible, installing weather-adapting irrigation controllers (Smart Sprinklers).
9. If economically feasible, replacing water-inefficient ground cover and landscaping (plants, trees, shrubs, bushes, flowers and grass turf) with drought tolerant, water frugal groundcover and landscaping that is more appropriate for San Diego’s local arid environment. These types of native vegetation are often labeled “California Friendly” by plant and tree nurseries. This could save each homeowner, based on the number of days in the week a watering occurs, on average 750 to 1500 gallons of water each month. – (Source a publication by the San Diego Coastkeeper). Some people may also consider the substitution of artificial turf in place of natural grass turf or other forms of ground cover. This option is one that will require little or no watering. However, for many San Diegans, artificial turf, most types of which are estimated to have an average useful life of 10 or more years, is likely to be viewed as either an unacceptable or otherwise cost prohibitive option.

A base comparison of water-efficient native California Friendly plants and trees to traditional grass turf ground cover is startling as can be seen in the following table. (the source of which is from a publication entitled “Lush & Efficient Gardening in the Coachella Valley” produced by the Coachella Valley Water District of California, a neighboring community northeast of San Diego.)

The following are estimates of the amounts of water needed in gallons per day

Plant Name	Description	Winter Month	Summer Month
Verbena	Low-use ground cover	0.7 gallons	0.9 gallons
Brittle Bush & Chuperosa	low-use shrubs	0.7 gallons	0.9 gallons
Ocotillo	low-use shrub	0.7 gallons	0.9 gallons
Traditional Grass Turf (Cool/warm season mix)	each 100 sq. ft.	17.8 gallons	19.4 gallons

To put the above numbers in perspective, if a landscape is watered every other day during the year, each 10 ft. by 10 ft. piece of a grass lawn would require an average of 18.6 gallons (the average of the winter and summer data shown above) x 183 days or 3,404 gallons of water each year. When one expands this to the number and actual size of typical residential property landscaping in San Diego the importance of implementing water-efficient landscaping becomes self-evident and material.

Using as an example a single-family property having a total footprint of 6,000 sq. ft. with traditional landscaping covering 60% of the total space (3,600 sq. ft.) the resulting estimated annual water use, assuming the property owner does not over-water, would be 122,544 gallons of water each year, assuming watering occurs only every other day and at no more than the level of water that should be used with each watering as indicated in the preceding table.

NOTE: All water districts in the State of California are required to implement stringent new landscape ordinances, patterned after the California’s ordinances, under AB1881 – The Water Conservation in Landscaping Act of 2006. The deadline for implementation at the water district level is January 2010.

**IROC has the following additional outdoor water saving recommendations.**

The use of potable water to wash cars is a questionable practice. At a minimum reduce the frequency of self car-washings and better control the use of water during the washings. Turning off the hose at the times when water is not specifically required could save as much as 150 gallons at each washing. (Source- U.S. Senator Barbara Boxer’s website and a publication by the San Diego Coastkeeper) Utilize professional car wash facilities whenever possible and only use those professional car wash facilities that recycle the water used in their operations.

The use of outdoor swimming pools represents another major use of potable water in our region. Swimming pools have the potential for a significant evaporative waste of water. One major way to reduce such water waste is to require that all swimming pools be covered when not actively in use. In addition to preserving water, pool covers also help to maintain and extend the usability of the water in swimming pools by preventing unwanted airborne materials from contaminating pool water.

Washing of buildings by hose or by a commercial power company should only occur when absolutely necessary.

**IROC has the following household and business water conservation usage recommendations.**

Household and business water use includes water used for drinking by people and pets, food preparation, showering and bathing, personal hygiene, dish washing and clothes washing. Water use inside a home or business varies from household to household and from business to business. This variance is caused by the unique water use patterns of each of the individuals within a household or business location.

1. San Diego should continue to require and actively enforce the installation of ultra-low-flush toilets, low-flow faucets and low-flow showerheads in all new building construction and mandate such replacements as a requirement of title transfer for all sales of older residential and commercial buildings that currently have non-low flow devices. This requirement is estimated to save between 500 and 800 of gallons of water per month. – (Source – a publication by the San Diego Coastkeeper)

The San Diego Water Department should consider providing some form of a one-time economic incentive to all homeowners and businesses that reduce their overall year-to-year water use by a to-be-determined percentage amount over the course of a year in comparison to their level of water use in the 12 month period prior to the designated 12 month period of reduced water use.

In addition, the top five ratepayers in each of the three major categories (single family residential, multi-family residential and Commercial / Industrial) that have reduced, on a percentage basis, their water use the most should receive special recognition and a reward (for example, an all expense paid attendance at a San Diego Chargers or San Diego Padres game of their choice, at which time their water conservation efforts will be acknowledged during some form of pre-game on-the-field ceremony with some of the players). This opportunity could be advertised, through periodic billing inserts as well as the Departmental Web sites as a Water-Conservation Contest available to all of San Diego's ratepayers.

2. Each water ratepayer should periodically assess whether there are any signs of water leakage within the home or place of business and should promptly fix all water pipe, faucet or fixture water leaks and drippings.
3. The following is a detailed listing of additional in-home or business potential water-conserving ideas that each member of the San Diego community needs to consider and implement where feasible. Individually, such items may seem inconsequential; however, if a sufficient number of San Diegans take such actions, the collective result becomes quite material with regard to reducing our overall demand for water as a community. Many of these recommendations have already been adopted in some of the homes and businesses in San Diego. It is now time to ensure that such actions receive a much greater degree of implementation through our community.
  - a. Reduce dishwasher usage by holding off use until at or near a full load. Partial loads needlessly waste both water and energy resources. In the interim, hand wash those few pots, pans, dishes and utensils that are needed before a full dishwasher load is reached. In these instances, fill up the sink rather than allow the faucet to run while the dishes are being hand washed.

- b. Try to run clothes washers and clothes dryers only when these appliances can be fully loaded. Washing partial loads wastes both water and energy. Also avoid overloading these appliance because that usually results in a need to re-run the washing or drying process causing a resultant waste of water, energy and time.

The combination of items a. and b. is estimated to save between 300 to 800 gallons of water in the average household per month. The variance is due to the fact that the frequency of use of these appliances varies widely among households. – (Source, a publication by San Diego Coastkeeper.)

- c. Restaurants should serve water only upon customer request, not automatically This practice is utilized in cities, towns and communities all over the United States, why not here in San Diego?
- d. Turning the faucet during daily teeth brushing, shaving, hand or face washing could save roughly 2,190 gallons of water each year, per person. (Source - U.S. Senator Barbara Boxer's website).
- e. Reducing daily shower time by just two minutes will save about 5 gallons of water each day or 1,825 gallons of water each year. (Source - U.S. Senator Barbara Boxer's website). These savings assume that a low-flow shower head is being used. If an older non-low flow shower head is in use, the savings would be about 10 gallons or approximately 3,650 gallons of water each year for a two minute reduction in daily shower time per person.
- f. Switching to Energy Star appliances, including clothes washer and dish washer, because these types of appliances may use 35 to 50 percent less water and 50 percent less energy per load than non-Energy Star compliant appliances. (Source - U.S. Senator Barbara Boxer's website).

Finally, if mandatory imposed water use restrictions are required, we recommend that the implementation of the differing levels of water use restrictions should be triggered objectively, for example when water supply levels drop below designated benchmark levels. The experiences of other communities in similar circumstances indicate that attempting to implement such requirements subjectively through a discretionary decision made by a water authority, a community water board or by state, county or local government elected officials could result in a delay in the implementing of required water conservation actions in a timely manner.

### **IROC has the following household and business wastewater compliance recommendations.**

Sewer spills, which contain an array of bacteria, viruses and parasites, pose a serious public health threat.

There has been an ongoing reduction in the occurrence of sewer spills (by 79% since 2000). In 2000, the city was experiencing close to a sewer spill a day. A primary cause of sewer spills continues to be from tree roots penetrating sewer pipes and the disposing of fats, greases and oils into kitchen sinks that feed into the city's sewer system. Continued reinforcement of the San Diego's MWW Department's FOG (Fats, Oils and Greases) education program is a key element in the fight to prevent sewer spills.

The citizens of San Diego need to dispose of hazardous materials properly. For example, a quart of oil or paint can contaminate up to 250,000 gallons of water, effectively eliminating that

amount of water from our water supply. – (Source – a publication by the San Diego Coastkeeper).

The disposal of non-biodegradable objects of whatever size down a sink or toilet can cause significant damage to a number of areas within San Diego's wastewater system. These items should be placed in trash receptacles.

Unused prescriptions and over-the-counter medications should never be flushed down a drain, toilet or sewer line. These items should be properly disposed of at a hazardous waste collection site or otherwise put in a tightly sealed container and placed in the trash.

MWWD needs to continue its monitoring, cleaning, rehabilitation and replacement of portions of the sewer system on a priority basis to minimize the buildup of sewage items which create the conditions that lead to sewer spills.



# APPENDIX N

## Alternatives for augmenting water conservation efforts

If increased water conservation efforts, on their own, are not likely to resolve San Diego's pending water supply challenge, what other options or actions should the water ratepayers and citizens of San Diego be considering?

In addition to increasing San Diego's water conservation efforts, our community also needs to evaluate, authorize and financially support the implementation of actions that will safely and at a comparatively affordable and reasonable cost either increase the sustainable quantity of water available for San Diego or otherwise increase or multiply the usability of San Diego's existing water resources.

The combination of actions we are proposing in this report represents the most cost-effective and reliable way for the ratepayers and citizens of San Diego to address effectively the pending water supply challenge. The time we have to move on such critical actions, if we want to avoid or materially reduce the impact of the looming water supply challenge, is running out.

In the following sections of this report we will discuss alternative actions, which can and should be taken at this time to either increase the supply of water for San Diego or otherwise increase or multiply the usability of San Diego's existing sources of water. We believe that the recommended actions we are proposing are needed to augment a significant greater level of community-wide participation in water conservation efforts.

## Seawater Desalination

The desalination of new potable water from ocean water is a significant alternative to be considered.<sup>3</sup>

This alternative has the potential of a near-limitless supply of ocean water that could reduce our reliance on imported water. However, this alternative also has several significant negative aspects. Seawater desalination is currently one of the most expensive ways to increase our water supply, both in terms of financial cost and its energy consumption impact on the environment. With desalination also comes a risk that the desalination pumps and intake systems have the potential to kill significant numbers of ocean life, potentially damage our coastal and ocean environment and could result in a reduction in public access to affected portions of our coastline.

Based on IROC's review of the recent experiences of the two largest seawater desalination projects undertaken to-date in the United States (Tampa, FL. - in operation, and Carlsbad, CA – in development), the time-line and aggregate developmental, operational, financial, and environmental costs associated with seawater desalination represent neither a comparatively near-term water supply solution for San Diego, nor is seawater desalination a relatively cost-efficient, environmentally friendly alternative in comparison to other alternatives discussed in subsequent sections of this report.

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<sup>3</sup> IROC is aware of the potential to use a similar treatment process for brackish water.

A major desalination plant commenced operations in 2003 near Tampa, which is currently the largest seawater desalination plant in the nation. Initially the plant operated at less than a third of its expected capacity of 25 MGD of drinkable water. The Tampa plant completed its regulator imposed remediation period in November 2007. Since then, this plant has been fully operational producing up to 25 MGD of drinkable water, which represents approximately 10% of the Tampa Bay region's drinkable water supply. The original cost estimate for the Tampa plant was \$110 million in 1999. The co-developer was replaced in 2002, and the plant was completed and began operations in 2003 at a revised cost of \$158 million. The cost of converting sea water into drinkable water at the Tampa plant was estimated to be \$1,100 per acre-foot when it became fully operational in November 2007. An Acre-foot is a measurement that is equivalent to 325,851 gallons of water.

Another water-desalination project is currently under way in Carlsbad CA. The plans for this project include the construction of a plant at an estimated cost of \$300 million that is projected to ultimately produce 50 MGD drinkable water a day. The developer's original plans expected production of drinkable water from the proposed plant by 2011.

The Carlsbad facility, when completed will be the largest desalination plant in the Western Hemisphere. The plant's developer originally (in 2006) estimated the cost of producing drinkable water from sea water at an operating cost of \$950 per acre-foot (which equals 325,851 gallons of water). However, the costs of generating the significant quantity of electricity required to operate the desalination plant have risen since the developer's original cost projections were rendered. The developer's \$950 per acre-foot water cost estimate represents only the direct cost of producing the water itself from seawater and does not address the costs associated with the necessary and routine operations, maintenance and enhancements to the remainder of the applicable water system infrastructure needed to process, store and deliver the water to each household and business throughout Carlsbad's water system.

The Carlsbad plant's estimated \$950 per acre-foot water-only cost for seawater desalination, as well as the Tampa plant's current cost of \$1,100 per acre-foot water-only cost for seawater desalination, needs to be put in perspective for the benefit of all ratepayers and citizens. San Diego, effective January 1, 2009, will be paying SDCWA a cost of \$598 per each acre-foot of untreated imported water and \$766 per acre-foot of treated imported water.

From these time-lines and costs drawn from both of these desalination plants and projects it is clear that a desalination alternative is neither a reasonably quick nor inexpensive solution to San Diego's future water needs.

Based on what the members of IROC have learned in the course of our work, the pursuit of producing potable water from ocean/sea water through current desalination technologies represents an alternative that is currently, in comparison to other available alternatives, relatively expensive and energy-inefficient. In the interest of the water ratepayers of San Diego, desalination represents an option to be considered only if and when we expect that more cost-efficient and less environmentally challenging alternatives for resolving San Diego's water requirements have been exhausted.

## **Indirect Potable Water Reuse (IPR) - A major step towards reducing San Diego's material dependence on imported (outside controlled) water**

Today, through the development of a well thought out and extensively tested series of processes, mankind now has the ability to process and treat most forms of wastewater in an effective manner that separates, captures and purifies a portion of what was wastewater into clear, odorless, drinkable water which fully meets or exceeds all of the stringent Federal and State environmental, health and safety standards and requirements established to protect the public's drinkable water.

Based on a constant monitoring and periodic testing of our potable water supply, every known potentially significant water contaminant is currently removed from the water supplies to all San Diegans; however, the additionally intense IPR purification processes established to convert, extract, capture and produce the pure water portion of wastewater represents a significant additional step in the removal of both known and unknown elements to something approaching the purity levels of distilled water.

The reality is that San Diegans are now, and have always been subject to having hundreds of other communities, farmers and businesses add elements to our sources of water that require removal and purification to protect the health and safety of all San Diegans.

It is estimated that over 400 MGD of treated wastewater is discharged daily into the Colorado River by over 225 separate sewer agencies in Colorado, Utah, Wyoming, Arizona, New Mexico and Nevada. In addition, an estimated 1.5 billion gallons of industrial treated wastewater is discharged each day by over 600 entities (municipal, industrial, agricultural and other permitted wastewater dischargers) into the Colorado River before its water flows to San Diego for a final water purification treatment. (Source – Data from a report presented at The 2005 Colorado River Basin Salinity Control Forum.)

With regard to water received from the S-SJ Delta area, it is estimated that over 1 billion gallons of treated wastewater is discharged daily into the Sacramento-San Joaquin Rivers by over 100 separate municipal sewer agencies in Northern California. It is estimated that more than 330 permitted municipalities, farmers and industrial sources discharge an estimated 2.1 billion gallons of treated residential, commercial and agricultural wastewater into the Sacramento and San Joaquin Rivers that flow into the S-SJ Delta, which ultimately flows by pipeline and aqueduct into the drinkable water of California homes, schools and businesses, including those in San Diego. (Source – The Central Valley Regional Water Quality Control Board, 2005).

Negative sound-bite labeling (“Toilet-to-Tap”) of San Diego's pursuit of an Integrated Potable Reuse (IPR) approach, coupled with a significant level of negative campaigning, has, in our opinion, been and still remains a misguided attempt to undermine IPR. The perception that these adversarial claims may be valid is no doubt aided by an uninformed psychological aversion to the concept of a reuse of wastewater as potable water.

The effect of such negative views about IPR has resulted in significant delays in the testing and implementation of this critically important, comparatively safe and environmentally sound option for increasing San Diego's available water resources at a very competitive cost, in comparison to available alternatives.

Numerous examples of successful and safe IPR projects exist. For example, Las Vegas, NV discharges 100 percent of that city's purified sewer water into Lake Mead, the primary storage facility for the portion of Colorado River water utilized as the main source of potable water by the citizens and ratepayers of Las Vegas. Another example is in Orange County, CA where purified sewage water is discharged into both surface lakes and underground aquifers which in turn serve as major sources of potable water for citizens and ratepayers in Orange County, CA.

Those who oppose IPR argue that there could be either undetectable or irremovable yet to be identified harmful elements in the fully treated wastewater. The counter to this argument is that because of the intense advanced water treatment that IPR water undergoes, as compared to San Diego's existing sources of purified potable water (from either the Colorado River or the S-SJ Delta), IPR water is actually a safer source of drinkable water (in terms of its potential for further eliminating such yet to be identified potentially harmful elements) than the drinkable water currently available for use in San Diego today.

SDWD and MWWD are currently pursuing in an IPR pilot study. In the planned IPR approach, the pure water portion of the thoroughly treated and purified reclaimed wastewater for MWWD's North City plant will be transferred into the existing water storage facilities for San Diego's normal water supply. As a result of the application of advanced water treatment processes (further described in Appendix O of this Report), the pure water portion of the reclaimed wastewater will actually be of better quality for drinking purposes (in terms of all environmental, health and safety standards) than the waters otherwise being received into these same water storage facilities from either the Colorado River or the S-SJ Delta.

### **Groundwater reclamation**

The San Pasqual Groundwater Management Plan, approved by San Diego's City Council in November 2007, allows SDWD to qualify for state and federal funds to assist in the management of the groundwater basin and implementation of projects. Groundwater monitoring wells have been established at Mount Hope and in Balboa Park. These wells will provide information on the condition of the groundwater basin and its water quality.

The SDWD needs to expand the exploration and development of geologically sound and water quality-appropriate groundwater aquifers for water production or storage on an economically prudent basis. In this way the evaporative losses associated with open-air reservoirs, where most of the water storage in San Diego County resides, can be substantially reduced.

Potential groundwater locations within our city are limited by both geological factors and by the semi-arid climate of the region. Many of the known groundwater basins contain water that, because of seepage from nearby Pacific Ocean waters, is too salty (brackish) for potable water sourcing or storage. Accordingly, the potential for groundwater reclamation, although it would help, is not likely to provide a meaningful resolution to San Diego's future water needs, even when combined with a more broad-based increased water conservation effort.

# APPENDIX O

## A description of San Diego's Indirect Potable Reuse Demonstration Project

Advances in water purification technologies that have been made and extensively tested and implemented by many other cities, towns and communities in the United States and other countries include the processes of Micro filtration, Reverse Osmosis and the combining of ultraviolet light treatment with hydrogen peroxide.

The following outline briefly summarizes the major components that are included within San Diego's proposed process of retrieving from San Diego's wastewater the portion that can be used as potable water.

1. Tertiary Treatment (a multi-step treatment process that filters out solids, organic materials, chemicals and germs to make the water of high enough quality for irrigation, commercial or industrial use, but not for human consumption).
2. Advanced Water Treatment (a combination of the following three processes):
  - a. Ultra-filtration – removes all protozoa, bacteria and suspended particles (this process is used in the processing of baby food, purification of medicines and fruit juices);
  - b. Reverse Osmosis – removes 98+% of dissolved organics and salts (this technology is used in creating bottled water, ocean water desalination and in the purification of water for drinkable purposes for U.S military personnel in areas like Iraq and Afghanistan as well as for victims of major natural disasters in the United States and around the world); and,
  - c. Advanced Oxidation – destroys most of the remaining dissolved organic molecules (this process is a combination of the use of ultraviolet light, which is also used to disinfect medical and dental instruments, and hydrogen peroxide).

At this stage in the wastewater to potable water process, the advanced treated water (AWT) has been designed to meet all established federal and state drinking water standards applied to the drinking water currently provided to houses and businesses through San Diego. The AWT process has been designed to eliminate or reduce to perfectly acceptable levels unregulated contaminants, endocrine disrupting compounds, pharmaceuticals and personal care products. As a result, AWT product water is actually of higher quality than San Diego's current raw (untreated) water supply from either the Colorado River or the S-SJ Delta.

3. After completing the Advanced Water Treatment process, the next step is the transfer of the AWT water in the pipeline between the AWT Plant and storage in a source water reservoir.
4. The AWT water will remain in reservoir status, blended with other water in storage, i.e., raw imported water and local runoff, for a period of time (to be determined by the California Department of Public Health).
4. After the expiration of the to be determined retention period in reservoir status, the AWT water, which at this point will be undistinguishable from the City's other sources of untreated potable water, will be moved to the City's potable water treatment plant and will then

undergo a final water purification treatment prior to movement into the City's water distribution system.

# APPENDIX P

## Key statistics for San Diego's water and wastewater Departments

### San Diego's Water Department

- a. Total service area covers 404 square miles (land and water)
- b. Population served is approximately 1.3 million people
- c. Over 3,280 miles of water distribution pipeline are operated and maintained
- d. There are over 273,000 water meters used to measure water usage by customers
- e. Over 217 million gallons of water is provided daily to customers (average demand)
- f. The water distribution system includes 29 water storage tanks/standpipes
- g. The water system also provides water to over 24,000 fire hydrants throughout San Diego
- h. Fifty pumping stations used to move water through the system
- i. The SDWD's system utilizes over 100 pressure zones
- j. Nine reservoirs are used to provide temporary storage of water until it is needed
- k. Three water treatment plants turn the City's supply of raw water into treated potable Water. The Alvarado plant's capacity is 120 MGD, the Otay plant's capacity is 34 MGD and the Miramar plant's capacity is being increased to 215 MGD from 140MGD
- l. The principal sources of water provided by the San Diego Water Department are as follows: Imported - 90%; Reclaimed – 3%; Local Surface (run-off) Water – 7%

**San Diego's existing potable water treatment process involves the following steps after the raw (untreated) water has been acquired, mostly through purchase and importation:**

1. Coagulation
2. Flocculation/Sedimentation
3. Filtration
4. Disinfection
5. pH Adjustment

### San Diego's Metropolitan Wastewater Department

- a. Service area covers a 450 square mile (land and water) area from Del Mar in the north, Alpine and Lakeside in the east and as far south as the United States / Mexico border
- b. The population served by MWWD is approximately 2.2 million people
- c. Approximately 3,000 miles of sewer and wastewater collection pipelines are maintained within the City of San Diego
- d. The system operates four wastewater treatment plants and two outfalls into the Pacific Ocean. The two outflows deposit the treated wastewater approximately 4.5 miles and 3.5 miles out from the coastline
- e. Over 175 MGD of sewage and wastewater are processed daily from customers
- f. The system treats and disposes of nearly 63 billion gallons of wastewater a year
- g. The wastewater system serves the City of San Diego and 14 other adjacent communities eighty-three pumping stations are utilized within the sewer system
- h. MWWD has the current capacity to produce a net 37.5 MGD of wastewater each day for potential reuse by customers. Of this amount roughly an average of between 2.5 and 13.7 MGD are actually used by reclaimed water customers
- i. An average of 100 dry tons of biosolids is produced each day by the wastewater system

- j. MWWD has an estimated 40 MGD in unused treatment capacity within its system
- k. Approximately 1,800 miles of the sewer pipeline network (60% of the overall network of sewer pipelines) are cleaned annually. Additionally, MWWD inspects, using closed circuit television camera placements within sections of the sewer system, over 100 miles of sewer pipelines each year.



# APPENDIX Q

## *Rules governing the business and procedures of the City of San Diego Independent Rates Oversight Committee (Bylaws)*

### **Article I Name**

The name of this committee is the City of San Diego Independent Rates Oversight Committee [Committee], which has been established by San Diego Municipal Code section 26.2002.

### **Article II Definitions**

For purposes of these Rules:

*Emergency situation* means: (1) a work stoppage or other activity that severely impairs public health, safety, or public resources, as determined by a majority vote of the members of the Committee; or (2) a disaster that severely impairs public health, safety, or public resources, as determined by a majority vote of the members of the Committee.

*Public Record Act* means the California public records law located at California Government Code sections 6250 through 6270, or as thereafter amended.

*Public utilities departments* includes the City of San Diego's Water Department and Metropolitan Wastewater Department, and their successor departments.

*Ralph M. Brown Act* means the California open meetings law located at California Government Code sections 54950 and 54962, or as thereafter amended.

*Robert's Rules of Order* means the tenth edition of the publication Robert's Rules of Order (Newly Revised) or as thereafter revised.

### **Article III Purpose of Committee**

Pursuant to San Diego Municipal Code section 26.2001, the Committee serves as an official advisory body to the Mayor and City Council on policy issues relating to the oversight of the City's *public utilities departments'* operations, including, but not limited to, resource management, planned expenditures, service delivery methods, public awareness, outreach efforts, high quality and affordable services provided by the *public utilities departments*. In addition, the Committee is established to assist the City in tracking and reviewing the use of rate proceeds to advance the capital improvements related to the rate packages and work programs adopted by the City Council. It is the vision of the Committee that a high level of public confidence in the City of San Diego's utility services is maintained while services are provided in the most cost effective and environmentally sensitive way.

#### **Article IV Membership on Committee**

Pursuant to San Diego Municipal Code section 26.2002, the Committee shall consist of eleven members, who are appointed by the Mayor and confirmed by the Council as follows.

- A. A majority of members are required to be residents of the City of San Diego.
- B. Each of the four ratepayer classes (single family residential, multifamily residential, commercial and industrial, and temporary irrigation and construction) will have one representative on the Committee.
- C. The Committee shall also include two ex-officio non-voting members, one representing and appointed by the Metropolitan Wastewater Joint Powers Authority, and one representing and appointed by the ten-member City representatives to the San Diego County Water Authority. Ex-officio members are not counted in determining whether a quorum is present.
- D. A majority of the members of the Committee shall possess expertise in one or more of the following areas: accounting, auditing, engineering, biology or environmental science, finance or municipal finance, law, and construction management.

#### **Article V Terms of appointment and Vacancies**

In accordance with San Diego Municipal Code section 26.2002 and Charter section 43(b):

- A. Except as otherwise provided in the San Diego Municipal Code, voting members of the Committee serve four-year terms and serve until a successor is duly appointed and confirmed.
- B. Members of the Committee may serve two consecutive four-year terms for a maximum of eight consecutive years. An individual may be reappointed after serving the maximum number of years; however, an interval of four years must pass before the individual is eligible for reappointment.
- C. Members of the Committee are to be appointed in such a manner that the terms of not more than six members will expire in any particular year.
- D. The expiration date for all terms of all members is May 1.
- E. Members appointed to fill vacancies may serve the unexpired term of any member whose place becomes vacant as well as two full terms.

IROC Bylaws - 3 - amended March 10, 2008

#### **Article VI No Compensation for Members**

In accordance with San Diego Municipal Code section 26.2002, Committee members will receive no compensation for their service on the Committee. However, members may be reimbursed for expenses they incur in performing their duties for the Committee.

### **Article VII Duties and Functions of the Committee**

In accordance with San Diego Municipal Code section 26.2003, the following are the duties and functions of the Committee.

A. Meet at least every other month with additional meetings convened as necessary and as determined by the Committee Chair.

B. Review reports from staff and an independent audit organization on rate and bond proceed expenditures.

C. Review independent performance audits of the *public utilities departments*.

D. Provide advice on the efficiency and performance of the *public utilities departments* on a regular basis.

E. Provide advice on future cost allocation models.

F. Oversee *public utilities departments* savings efforts and deposits to the “Dedicated Reserve from Efficiency and Savings” fund to be established as another part of the safeguard plan.

G. Assist in the selection and retention of an independent firm to conduct the annual financial audit of the *public utilities departments’* budget activity.

H. Assist in the selection and retention of an independent firm to conduct the annual performance audit to be set for each *public utilities department*.

I. Provide an annual public report on the above issues to the Mayor and City Council.

J. Provide advice and review of policy and proposals as sought by *public utilities departments* leaders and other City staff related to budget and finance, environmental issues, technology innovations, public outreach and education efforts.

K. Perform such further duties as may hereafter be delegated to the Committee by request of the Mayor or resolution of the City Council.

IROC Bylaws - 4 - amended March 10, 2008

L. Any duties or functions of the Committee that fall within the oversight responsibilities of the City's Audit Committee should be fully coordinated with and reported to the City's Audit Committee.

### **Article VIII Officers of the Committee**

A. After the initial year of the existence of the Committee, on or after May 1, 2009, the Committee shall select from among its members one member each as Chair and Vice-Chair for terms of one year. The member serving as Chair may be appointed for an additional one year term provided there is a one year interval between consecutive terms as Chair. The Committee may elect a Vice-Chair from among its members to serve for the initial year of the existence of the Committee.

B. The members of the Committee may elect a Secretary from amongst themselves. In lieu of electing a Secretary, the Committee may rely on staff to be designated by the City, with approval of the Chair, to perform some or all the function of Secretary.

C. The members may elect any other officers from amongst themselves that the Committee finds necessary to conduct its business.

### **Article IX Duties of the Officers**

A. The Chair shall be the principal officer of the Committee who is responsible for the general supervision and direction of the Committee's business. It shall be the duty of the Chair: (1) to bring all pertinent issues to the attention of the Committee; (2) to establish the agendas for Committee meetings; (3) to present all Committee reports and recommendations to the City Council and Council committees; and, (4) to delegate duties as necessary. Items may also be placed on a future agenda by a majority vote of the members of the Committee. The Chair shall be an ex-officio member of all sub-committees established by the Committee.

B. In the absence of the Chair, the Vice-Chair shall exercise all the powers of the Chair. The Vice-Chair shall be an ex-officio member of all sub-committees established by the Committee.

C. The Secretary shall maintain all Committee attendance records and other records of the Committee. The Secretary shall prepare and maintain minutes of all Committee meetings and shall prepare all written reports and recommendations of the Committee. The Secretary shall be the custodian of Committee records for purposes of requests made under the *Public Records Act*. The Secretary shall carry out any other duties assigned by the Chair. Designated City staff may perform the function of Secretary if so desired by the Committee.

IROC Bylaws - 5 - amended March 10, 2008

D. Each officer shall have the powers and duties that are normally exercised by persons holding that office, except as otherwise provided by these rules.

### **Article X Subcommittees**

The Committee may create standing or ad hoc subcommittees to assist the Committee in the performance of its duties. All members of standing subcommittees must be members or ex officio members of the Committee. Ex-officio members of the Committee may be voting members of any subcommittees. Non-members of the Committee may be non-

voting members of ad hoc subcommittees created by the Committee. Meetings of all standing subcommittees and ad hoc subcommittees with non-members of the Committee must be held in accordance with the rules established for the Committee itself and in accordance with the *Ralph M. Brown Act*. When and as long as any subcommittee lacks sufficient members to constitute a quorum for the conduct of business, the Committee Chair and/or Vice-Chair is authorized to act as a voting member of that subcommittee.

#### **Article XI Meetings of the Committee**

All meetings of the Committee shall be held in accordance with Council Policy 000-16 and the *Ralph M. Brown Act*. If there is any conflict between these rules and the *Ralph M. Brown Act*, the *Ralph M. Brown Act* shall prevail.

A. The Committee shall hold at least one meeting every other month at times and dates to be determined by resolution adopted by the Committee. The subject matter to be considered at regular meetings shall be announced to the public and news media through a written agenda posted in a location that is freely accessible to members of the public at least 72 hours in advance of such meetings.

B. In addition to its regular meetings, the Committee may hold special meetings. Special meetings must be announced to the public and news media through a written notice and agenda posted in a location that is freely accessible to member of the public at least 24 hours prior to such meetings.

C. The Committee may hold a special emergency meeting without complying with the 24 hour notice requirement only if an *emergency situation* exists.

D. The Committee may hold closed sessions only for the purposes authorized under the *Ralph M. Brown Act* and in accordance with the procedures set forth in that Act for closed sessions.

E. In order to help ensure a quorum, if any member misses three or more Committee meetings in a calendar year (excluding special meetings) which are unexcused, the individual is automatically removed from membership on the Committee. The Chair shall determine whether absences are excused or unexcused, and state the basis for each decision at the next regularly scheduled meeting of the Committee.

IROC Bylaws - 6 - amended March 10, 2008

If an absence is that of the Chair, the Vice-Chair shall determine whether the Chair's absence is excused or unexcused, and state the basis for the decision at the next regularly scheduled meeting of the Committee. Any voting member of the Committee may contest the determination of the Chair or Vice-Chair by so moving, and if the motion is seconded by a voting member, the matter shall be placed on the agenda of the next regularly scheduled meeting. Whether the absence is excused or unexcused will then be determined by majority vote of the Committee.

#### **Article XII Agendas**

A. Except as provided in Article XIIB, agendas containing a brief general description of each item of business to be transacted or discussed at the Committee's meetings shall be posted at the times required by and in accordance with Article XI. The brief description of each item generally need not exceed 20 words.

B. Committee members may discuss items of business not posted on an agenda only after the Committee has publicly identified the item and only if at least one of the conditions listed in Article XIIB(I)-(3) is satisfied:

(1) The Committee has determined by a majority vote that an *emergency situation* exists; or,

(2) Two-thirds of the members of the Committee present at the meeting vote or, if less than two-thirds of the members are present, those members present vote unanimously, that there is a need to take immediate action and that the need for action came to the attention of the Committee subsequent to the agenda being posted; or,

(3) The time was posted in accordance with Article XI for a prior meeting of the Committee that occurred not more than five calendar days prior to the date action is taken on the item, and at the prior meeting the item was continued to the meeting at which action the is being taken.

### **Article XIII Public Comment**

A. Public comment on agenda items at regular or special meetings of the Committee. (1) Every agenda for regular or special meetings of the Committee shall provide an opportunity for members of the public to directly address the Committee body concerning each item that has been described in the notice for a particular meeting before or during consideration of that item.

B. Public comment on non-agenda items at a regular meeting of the Committee IROC Bylaws - 7 - amended March 10, 2008 (1) Every agenda for a regular Committee meeting shall provide a period on the agenda for member of the public to address the Committee on items of interest to the public that are not on the agenda but are within the jurisdiction of the Committee. Subject to the exercise of the Chair's discretion for a given agenda, time shall be designated for public comment on non-agenda items at regular meetings.

C. Speakers shall be limited to three minutes each and public comments shall be limited to thirty minutes per subject regardless of the number of people in attendance. The time limit may be waived by either the Chair or a majority vote of the members of the Committee.

D. The Committee may adopt reasonable rules and regulations governing public comment that are not in conflict with these Rules, the San Diego Municipal Code, or the *Ralph M. Brown Act*.

### **Article XIV Parliamentary Procedures**

Unless otherwise provided in these Rules, the procedure for meetings shall be governed by *Robert's Rules of Order*.

#### **Article XV Resolution of Conflicts between these Rules and Other Law**

If there is a conflict between these Rules and any applicable ordinance, charter section, or statute, the applicable ordinance, charter section, or statute shall prevail.

#### **Article XVI Effective Date of Rules; Amendments to these Rules**

These Rules shall become effective upon approval by the Committee in the form of a resolution. These Rules may be amended only by resolution of the Committee.

#### **Article XVII Committee's Authority to Adopt Rules for Conducting its Business**

The Committee may adopt rules that are not addressed in these Rules that the Committee deems necessary to conduct its business. The Committee shall adopt the rules by majority vote of the members of the Committee in the form of a written resolution. Any rules that the Committee adopts must conform to these Rules and to applicable law.

# APPENDIX R

*Copy of San Diego Municipal Code sections that established IROC's purpose, membership, duties and functions*

## **San Diego Municipal Code Chapter 2: Government**

### **Article 6: Board and Commissions**

#### **Division 20: City of San Diego Independent Rates Oversight Committee**

##### **§26.2001 Purpose and Intent**

It is the purpose and intent of the City Council to establish the Independent Rates Oversight Committee to serve as an official advisory body to the Mayor, City Council, and City Manager on policy issues relating to the oversight of the City of San Diego's public utilities department operations including, but not limited to, resource management, planned expenditures, service delivery methods, public awareness and outreach efforts, high quality and affordable utility services provided by the public utilities departments, including the Water and Metropolitan Wastewater Departments. In addition, the Independent Rates Oversight Committee is established to assist the City in tracking and reviewing the use of rate proceeds to advance the capital improvements related to the rate packages and work programs adopted by the City Council. It is the vision of the Independent Rates Oversight Committee that a high level of public confidence in the City of San Diego's utility services is maintained because the services are provided in the most cost effective and environmentally sensitive way.

##### **§26.2002 Independent Rates Oversight Committee Established**

(a) There is hereby created an Independent Rates Oversight Committee to consist of eleven members, the majority of whom shall be residents of the City of San Diego, who shall serve without compensation. The members shall be appointed by the Mayor and confirmed by the City Council. Each of the four ratepayer classes (single family residential, multifamily residential, commercial and industrial, and temporary irrigation and construction) will have one representative on the Committee. The Committee shall also include two ex-officio members, one representing and appointed by the Metropolitan Wastewater Joint Powers Authority, and one representing and appointed by the ten-member City representatives to the San Diego County Water Authority. A majority of the members of the committee shall possess expertise in one or more of the following areas: accounting, auditing, engineering, biology or environmental science, finance or municipal finance, law, and construction management.

(b) Members shall serve four year terms, and each member shall serve until a successor is duly appointed and confirmed. In accordance with City Charter section 43, members are limited to a maximum of eight consecutive years, and an interval of four years must pass before such persons can be reappointed.

Initial members shall be appointed such that the terms of not more than six members shall expire in any one year so as to allow the Committee to be staggered. For the initial appointments, five members shall be appointed to an initial term that will expire May 1, 2009, and six members shall be appointed to an initial term that will expire May 1, 2011. Initial appointments which are



less than the full term of four years will be allowed to serve two full terms. The expiration date of all terms shall be May 1. Any vacancy shall be filled for the remainder of the unexpired term. Vacancy appointment recommendations will come from the original recommending body. Any vacancy replacements will be eligible to serve the remaining term of the vacant position and two full terms.

(c) For the initial year, the Mayor will designate one member as Chair. Thereafter, the Committee shall on or after May 1, select a Chair from among its members. The Chair will serve a one year term with the option of reappointment for one additional one year term, with a one year interval between consecutive terms as Chair.

(d) The Committee may adopt rules consistent with the law for the governing of its business and procedures.

(e) A conflict of interest code shall be adopted for the Committee, subject to City Council approval. The members of the Committee shall be required to complete and file statements of economic interests in accordance with the conflict of interest code.

### **§26.2003 Duties and Functions**

The Committee shall:

(a) Meet at least every other month with additional meetings convened as necessary and as determined by the Committee Chair, and set an attendance policy for Committee members to help ensure a quorum of members are present for all meetings. (b) Review reports from staff and an independent audit organization on rate and bond proceed expenditures.

(c) Review independent performance audits on Water and Wastewater systems.

(d) Provide advice on the efficiency and performance of Water and Wastewater systems on a regular basis.

(e) Provide advice on future cost allocation models.

(f) Oversee departmental savings efforts and deposits to the “Dedicated Reserve from Efficiency and Savings (DRES)” fund to be established as another part of the safeguard plan.

(g) Assist in the selection and retention of the independent firm to conduct the annual financial audit of the utility departments’ budget activity.

(h) Assist in the selection and retention of the independent firm to conduct the annual performance audit to be set for each utility department.

(i) Provide an annual public report on the above issues to the Mayor and City Council.

(j) Provide advice and review of policy and proposals as sought by department leaders and other City staff related to budget and finance, environmental issues, technology innovations, public outreach and education efforts.

(k) Perform such further duties as may hereafter be delegated to the Committee by resolution of the City Council.

(l) Any duties or functions of the Independent Rates Oversight Committee that fall within the oversight responsibilities of the Audit Committee should be fully coordinated with and reported to the Audit Committee.

**IROC accomplished each component of the responsibilities established for it within the above listed City Municipal Code sections as follows:**

**§26.2001 Purpose and Intent**

**Independent Rates Oversight Committee (IROC) was established to serve as an official advisory body to the Mayor, City Council, and City Manager on policy issues relating to the oversight of the City of San Diego’s public utilities department operations including, but not limited to, resource management, planned expenditures, service delivery methods, public awareness and outreach efforts, high quality and affordable utility services provided by the public utilities departments, including the Water and Metropolitan Wastewater Departments.** - The contents of this Report and the minutes of the monthly meetings of IROC and of each of its Subcommittees evidence compliance with these requirements.

**In addition, the Independent Rates Oversight Committee was established to assist the City in tracking and reviewing the use of rate proceeds to advance the capital improvements related to the rate packages and work programs adopted by the City Council in the most cost effective and environmentally sensitive way.** – IROC accomplishes this responsibility through its periodic reviews of the status of rate-case related Capital Improvement Projects.

**§26.2002 Independent Rates Oversight Committee Established**

**IROC is to consist of eleven members, the majority of whom shall be residents of the City of San Diego, who shall serve without compensation. Each of the four ratepayer classes (single family residential, multifamily residential, commercial and industrial, and temporary irrigation and construction) will have one representative on the Committee. The Committee shall also include two ex-officio members, one representing and appointed by the Metropolitan Wastewater Joint Powers Authority, and one representing and appointed by the ten-member City representatives to the San Diego County Water Authority. A majority of the members of the committee shall possess expertise in one or more of the following areas: accounting, auditing, engineering, biology or environmental science, finance or municipal finance, law, and construction management.** - With the exception of periodic vacancies that occurred during 2008, IROC has maintained compliance with these requirements.

**§26.2003 Duties and Functions**

(a) **Meet at least every other month.** IROC holds monthly meetings of the full committee and of each of its three subcommittees, with the exception of one month each year.

- (b) **Review reports from staff and an independent audit organization on rate and bond proceed expenditures.** As indicated in Appendix I to this Report, IROC reviews all recent reports and commentary on the Departments issued by external auditors and regulatory authorities
- (c) **Review independent performance audits on Water and Wastewater systems.** Appendices S and T of this report contain the Annual Performance Reports on San Diego's Water and Metropolitan Wastewater Departments which were independently designed and prepared by members of IROC.
- (d) **Provide advice on the efficiency and performance of Water and Wastewater systems on a regular basis.** IROC provides such advice on a regular basis through its monthly committee and subcommittee meetings. An effective summary of the more significant items of advice is contained throughout this Report.
- (e) **Provide advice on future cost allocation models.** IROC provides such advice as part of its review of departmental operations and through its periodic reviews of both Departments rate structures.
- (f) **Oversee departmental savings efforts and deposits to the "Dedicated Reserve from Efficiency and Savings (DRES)" fund.** Appendix H of this Report discusses IROC's review of the DRES accounts of both Utilities
- (g) **Assist in the selection and retention of the independent firm to conduct the annual financial audit of the utility departments' budget activity.** See item (l) below. There have not been separate entity-specific annual financial audits of either SDWD or MWWD for many years. In IROC's opinion, the reestablishment of such stand-alone financial audits for these utilities, which are not currently required of either SDWD or MWWD by the National Bond Rating Agencies (S&P, Moody's and Fitch) or by any existing bondholder agreements, would add a significant additional annual administrative cost payable by water and wastewater ratepayers and may not provide an offsetting benefit beyond the audit coverage of SDWD and MWWD currently addressed in the annual CAFR audit of the City of San Diego, which includes the operations and financial accounts of both Departments.
- (h) **Assist in the selection and retention of the independent firm to conduct the annual performance audit to be set for each utility department.** Appendices S and T of this report contain the Annual Performance Reports on San Diego's Water and Metropolitan Wastewater Departments which were independently designed and prepared by members of IROC.
- (i) **Provide an annual public report on the above issues to the Mayor and City Council.** IROC's preparation and issuance of this Report accomplishes this requirement.
- (j) **Provide advice and review of policy and proposals as sought by department leaders and other City staff related to budget and finance, environmental issues, technology innovations, public outreach and education efforts.** IROC provides such services at and through its monthly Committee and Subcommittee meetings.

**(k) Perform such further duties as may hereafter be delegated to the Committee by resolution of the City Council.** Currently, no additional duties have been delegated to IROC by City Council.

**(l) Any duties or functions of the Independent Rates Oversight Committee that fall within the oversight responsibilities of the Audit Committee should be fully coordinated with and reported to the Audit Committee.** Representatives of IROC met with Council Member Faulconer, (now Council President Pro Tem Faulconer) and indicated IROC willingness to coordinate any matters that might appear to overlap with the responsibilities of IROC and the City's Audit Committee. Currently there do not appear to be any such matters.

# APPENDIX S

## *Annual Performance Report for the fiscal year ended June 30, 2008 for San Diego's Water Department*

In developing the first annual performance reports on San Diego's Water Department, IROC believed that we needed to measure certain key elements of the Department's performance over time, on a measurable or statistic basis, as well as to measure the current fiscal year's (FY 2008) performance of the Department against several recognized industry or peer group operating performance benchmarks.

Additionally, as part of the Annual Performance Report, we also chose to evaluate the Water Department's Quality of Service based on a group of measures specifically selected by IROC, that we believe matter to the water system ratepayers of San Diego.

### **Comparison of San Diego Water Department Operating Performance Statistics with peer groups of other water utilities**

In order to gauge the comparative operating performance of San Diego's Water Department in relation to the operating performances of water utilities located in other communities, IROC chose a series of performance measurements and utility peer groupings from surveys conducted and published by the American Water Works Association (AWWA). The latest available survey data from AWWA was as of 2007. Accordingly, AWWA's 2007 survey data was used in comparison to the fiscal year 2008 data reported to IROC by the San Diego's Water Department.

AWWA's 2007 survey compared performance statistics among a group of 180 utilities (60 water-only providers, 14 wastewater-only entities and 106 combined water / wastewater utilities). Of the total 180 utilities, 49 were located in the western part of the nation. Of this number, a total of 17 were water-only utilities, 5 were wastewater only entities and the remaining 27 were combined water/wastewater utilities. In terms of size of organization, a total of 20 of the entities included in the survey serve communities with populations greater than 500,000 people. Of these larger entities, 6 were wastewater-only utilities and the remainder was combined water/wastewater entities.

As the following comparisons disclose, IROC chose the compare San Diego's Water Department with three distinct peer groups of water utilities: 1) all water utilities included within the AWWA survey regardless of size or location in the U.S.A. (national peers); 2) all water utilities, without regard to their size, included in the AWWA survey located only in the Western U.S.A.; and, 3) all water utilities included within the AWWA survey that serve only communities with populations greater than 500,000 people located anywhere in the U.S.A.

IROC's development of operating performance comparisons between San Diego's Water Department and the three AWWA peer groupings (see pages 57 to 59) disclosed the following comparative results.

## Operating Performance Measurement

Number of Customers per Employee	- The San Diego Water Department number would rank in the <b>Bottom Quartile</b> of the three peer groupings
Number of MGD Processed per Employee	- The San Diego Water Department number would rank <b>near the Median</b> of the three peer groupings
Average Residential Monthly Charge	- The San Diego Water Department number would rank in the <b>Bottom Quartile</b> of the three peer groupings
System Pipeline Renewal / Replacement %	- The San Diego Water Department number would rank <b>near the Median</b> of the three peer groupings
Treatment and Pumping Facilities Renewal/ Replacement %	- The San Diego Water Department number would rank In the <b>Top Quartile</b> of the three peer groupings
Water System Distribution Water Loss %	- The San Diego Water Department number would rank <b>near the Median</b> of the three peer groupings
Operations & Maintenance Costs per Customer Account	- The San Diego Water Department number would rank in the <b>Bottom Quartile</b> of the three peer groupings
Operations & Maintenance Costs per Million Gallons Processed	- The San Diego Water Department number would rank in the <b>Bottom Quartile</b> of the three peer groupings
Direct Treatment Cost per Million Gallons Processed	- The San Diego Water Department number would rank in the <b>Top Quartile</b> of the three peer groupings
Number of System Failures (leaks and pipeline breaks) per 100 Miles of Pipeline System	- The San Diego Water Department number would rank <b>among the best in the Top Quartile</b> of the three peer groupings
Drinking Water Compliance Performance	- The San Diego Water Department number would rank in the <b>Top Quartile</b> of the three peer groupings

- Among the preceding operational performance measurement comparisons there were a number in which the San Diego Water Department's performance measurement would have ranked in the **Bottom Quartile** of the three peer groupings. Preliminarily, it appeared to IROC that each of these rankings might result from the related component of departmental operating costs being higher than it should be in comparison to similar costs being incurred by the members of the peer groups.
- For example, the comparative results for the number of customer accounts per employee implies that the number of Water Department employees in San Diego is higher than they otherwise should be, based on the peer group ratios. However, on a MGD of water processed per employee basis, San Diego's employee number appears to fall in line with the median performance of the peer groups.

- The Average monthly billing for Water services for San Diego in comparison to peer group data is quite high. The source of this significant variance from peer group amounts for average water service billings appears to arise from San Diego's significantly higher Operations and Maintenance expense ratios in comparison to the peer groups.
- The comparative results for the Operations & Maintenance expense as allocated over either the number of customer accounts or MGD of water processed implies that San Diego's Operations & Maintenance expense are higher than they otherwise should be based on the peer group ratios. This requires further analysis to determine the cause or causes of such a significant variance in Operations and Maintenance expense.

From the above information, IROC concluded that it needed to obtain a better understanding of what might be causing the San Diego Water Department's comparatively higher Operations & Maintenance costs and, if possible, to determine whether there are steps that can be taken to improve the San Diego Water Department's comparative Operations & Maintenance cost performance as well as those other comparisons in which San Diego's Water Department ranked in the Bottom Quartile. IROC regards each of these items to be of critical importance to the Water Ratepayers of San Diego.

In the performance of IROC's overall reviews and analysis of the Water Department, the following items were noted, which we believe materially explain and support the higher than peer group results for: Operations and Maintenance Expense level; employee to customer account ratio; and, higher than peer group monthly residential water charges.

**Material challenges that adversely impact the operating efficiency of San Diego's Water Department in comparison to those of other water utilities.**

- 1) San Diego's material reliance on the purchase of imported water to meet the City's daily water supply requirements. Approximately 43 cents of every dollar paid by San Diego's water ratepayers goes towards the purchase of 90% of the water distributed by the San Diego Water Department. This level of reliance on sources of water located hundreds of miles away results in a meaningful operating cost disadvantage for San Diego in comparison to other large and small water utilities located elsewhere in the nation.
- 2) San Diego has a proportionally larger system geographic size requirement, on a per capita basis, than other major wastewater systems in California and in the nation. This results from to a greater geographic dispersion of the customers being served by the system as expressed in terms of customer population density per square mile of service area. Appendix C to this report contains comparative analyses of the geographic footprint San Diego's wastewater system versus the other members of the ten largest cities in California and the ten largest cities in the nation.

- 3) In the course of our review of the Water Department we noted a rather high employee benefit expense percentage allocation (in comparison to the applicable salaries expense allocations associated with such employee benefit expense) being charged to the San Diego Water Department. We noted that this comparatively high benefits expense ratio also existed within all of the Service Level Agreements involving the Water Department as a payer or receiver of payments for services rendered between the Water Department and other City of San Diego departments or agencies. See Appendix G for the results of IROC's review of these Service Level Agreements. We understand that the cause of such higher than expected employee benefit expense allocations are due to a need for the City to address major employee pension and possibly other employee benefit funding shortfalls of prior years in addition to current period employee benefit plan expense. The causes of such shortfalls have received extensive disclosure in the media since 2004 and are not arising from any areas under the control or scope of responsibility of the Water Department. Since the employees of the Water Department are fully included in the City's historic and current employee benefit plans, such "catch-up" allocations, although an added operational cost burden at this time, are required under generally accepted accounting principles.
- 4) A credit rating disadvantage in comparison to other large water utilities which adversely can impact the interest rate costs of the Water Department's public and private placement borrowing costs for funding multi-year infrastructure replacement, enhancement and expansion projects. Appendix B to this Report provides comparative Credit Ratings for San Diego and for a number of other major U.S. cities. In view of the material scope of Water Department capital project financings in comparison to annual Water Department revenue received from ratepayers (roughly \$300 million in fiscal year 2008), a small variance in the annual interest rate cost of the Department's borrowings can have a meaningful effect on the Water Department's overall costs. As of June 30, 2008, the Water Department had outstanding borrowings of \$ 744 million and is projecting to accomplish approximately \$ 611 million of capital investment projects in the four year period ending June 30, 2012. Approximately 74% of these projected capital expenditures are required to achieve or maintain compliance with a California Department of Health compliance order to fund pipe replacements, improve treated water storage and water treatment facility upgrades. The \$611 million of projected capital expenditures are expected to be 80% funded by new borrowings.

In IROC's opinion, the collective impact of these four material factors adequately explains the comparative performance disadvantage with regard to each of the measures in which San Diego's operating performance would place in the bottom quartile of the respective peer groupings.

### **Review of Operational Performance Trends within the San Diego Water Department**

IROC chose to analyze the five year trends in the major operational expense components of the Water Department's annual expenditures expressed in terms of the cost as measured per millions of gallons (MGD) of water delivered during each respective fiscal



year. For these purposes, the trend in CIP expenditures and bond payments were excluded from further analysis.

### Millions of Gallons Delivered

FY 2004	75,293
FY 2005	70,783
FY 2006	71,127
FY 2007	75,024
FY 2008	73,229

Expense (In \$ thousands)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
Water Purchases	\$107,423	\$100,825	\$108,197	\$125,978	\$130,251
CIP Expenditure	90,885	96,003	58,761	36,588	61,251
Bond Payments	32,536	32,080	33,345	38,088	40,535
Personnel + Costs*	51,219	53,123	56,128	54,676	56,697
Pension Expense	7,505	10,624	12,668	13,415	15,127
Other Expenses**	73,544	67,435	56,207	58,024	64,344
	-----	-----	-----	-----	-----
Total Expenditures	\$363,112	\$360,090	\$325,306	\$326,769	\$368,205

The following shows the above amounts expressed as a percentage of total expenditures:

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
Water Purchases	29.6%	28.0%	33.3%	38.6%	35.4%
CIP Expenditure	25.0	26.7	18.1	11.2	16.6
Bond Payments	9.0	8.9	10.3	11.7	11.0
Personnel + Costs*	14.1	14.8	17.3	16.7	15.4
Pension Expense	2.1	3.0	3.9	4.1	4.1
Other Expenses**	17.5	15.9	14.9	14.8	14.1
	-----	-----	-----	-----	-----
Total Expenditures	100.0%	100.0%	100.0%	100.0%	100.0%

\* Personnel expense including wages and fringe benefit costs (except for pension related expense).

\*\* Includes the sum of all other operating expenses incurred in the operation of the Water Department.

It should be noted that all personnel and non-personnel operating expenses of the Water Department during fiscal year 2008 (exclusive of the cost of water purchases, CIP expenditures and bond payments) represented 33.6% of the Water Departments total fiscal year 2008 expenditures. CIP and bond repayments comprised 27.6% of total fiscal year 2008 expenditures, while the cost of purchased water was 35.4% of total expenditures and equaled approximately 43% of water sale revenues billed to the ratepayers.

**Five Year Trend in Purchased Water Expense as measured per Millions of Gallons of water delivered:**

<u>Fiscal Year</u>	<u>\$ / MGD</u>	<u>% Change from Prior Year</u>
2004	1,427	---
2005	1,424	---
2006	1,521	6.8%
2007	1,679	10.4%
2008	1,779	6.0%

**Five Year Trend in Personnel Expense as measured per Millions of Gallons of water delivered:**

<u>Fiscal Year</u>	<u>\$ / MGD</u>	<u>% Change from Prior Year</u>
2004	680	---
2005	751	10.4%
2006	789	5.1%
2007	729	(7.6%)
2008	774	6.2% (1.9% less than FY 2006)

**Five Year Trend in Pension Expense as measured per Millions of Gallons of water delivered:**

<u>Fiscal Year</u>	<u>\$ / MGD</u>	<u>% Change from Prior Year</u>
2004	100	---
2005	150	50.0%
2006	178	18.7%
2007	179	0.6%
2008	207	15.6%

**Five Year Trend in Other Expenses as measured per Millions of Gallons of water delivered:**

<u>Fiscal Year</u>	<u>\$ / MGD</u>	<u>% Change from Prior Year</u>
2004	977	---
2005	953	(2.5%)
2006	790	(17.1%)
2007	773	(2.2%)
2008	879	13.7%

The above five-year trends in expense show a pattern of significant annual increases in both Purchased Water and Pension Cost Expenses for the Water Department. Neither cost is under the direct control of Water Department personnel.

Fiscal Year 2008 Personnel Expense was affected by a 4% annual salary increase that became effective early in fiscal year 2008 and by a 2.4% decrease in the volume of water delivered in fiscal year 2008 versus fiscal year 2007, which by itself would have resulted in a 2.4% increase in Personnel Costs as reported on a \$/MGD basis if actual personnel expense had remained the same as in fiscal year 2007.

The aggregate increase in fiscal year 2008 Other Expenses occurred within expense line items such as data processing cost, other support services, supply costs, rent, vehicle and chemicals costs and SLA services. Given the significant decreases experienced in this category of expenses from fiscal years 2004 through 2007, and the effect that the

previously noted decrease in the volume of water delivered in fiscal year 2008 versus fiscal year 2007 had on the Other Expense \$ / MGD number for fiscal year 2008, IROC believes that this category of expense is acceptable for fiscal year 2008 but needs to be further monitored and evaluated by the Water Department and by IROC going forward.

### **Evaluating the Water Department’s Quality of Service**

IROC chose the following items to provide it with a measurement of the Department’s quality of service during fiscal year 2008.

The Water Department’s Drinking Water Compliance Rate, including the number of Primary Maximum Contaminant Level violations as measured by SDWD’s potable water quality sampling program disclosed full compliance for all 366 days in fiscal year 2008.

Summary of the number of water main breaks that occurred and an estimate of the aggregate volume of water released in these incidents during fiscal year 2008 in comparison to the four prior years’ results:

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
Number of Water Main Breaks	116	110	105	118	105
Estimated water discharged (in millions of gallons)	101	66	92	89	24

The reduction in the estimated volume of water discharged in fiscal year 2008 represents a significant accomplishment for Water Department personnel.

Percentage of water main breaks responded to within one (1) hour –	62.7%
Percentage of hydrant knock-overs responded to within one (1) hour –	94.6%
Percentage of service leaks investigated within two (2) days of notice –	86.2%
Percentage of service leaks fully repaired within seven (7) days of notice –	97.7%
Percentage of city-side valve leaks repaired within five (5) working days of notice –	90.7%

### **Summary evaluation of the Water Department’s performance for fiscal year 2008**

Based on the preceding five year trend analyses, comparative peer analyses, quality of service measurements and the additional research and analyses we have performed in other sections of IROC’s Annual Report for fiscal year 2008, we rate the operational performance of San Diego’s Water Department for fiscal year 2008, **Acceptable**.

A rating higher than Acceptable (such as excellent or above average) was not considered in view of the previously mentioned material challenges that adversely impact the operating efficiency of San Diego’s Water Department in comparison to those of other water utilities and the impact of such factors on the overall operating costs of the Water Department as reflected in the monthly billings to ratepayers. In the opinion of IROC, the management and staff of the San Diego Water Department are performing admirably in the face of such challenges, however, San Diego water ratepayers, in comparison to water ratepayers in other communities, are and will continue to be burdened by these material challenges. Based on the work we have performed, we have a much greater understanding of the challenges faced daily and prospectively by the management and staff of the Water Department. We commend them for their efforts and their

performance. However, we would encourage the Management of the Water Department and the Policy Makers having authority over the Department to actively pursue opportunities to reduce the effective cost of supplying water to the ratepayers of San Diego and have included in Appendix A of IROC's Annual Report for fiscal year 2008 a series of recommendations to assist them in their pursue of such opportunities.

<b>Comparison</b>	<b>FY 2008 Data for San Diego's Water Dept.</b>	<b>2007 Peer Group Top Quartile Average</b>	<b>2007 Median</b>	<b>2007 Peer Group Bottom Quartile Average</b>
<b>Number of Customers per Employee</b>	<b>347</b>			
<b>(See Note A)</b>	<b>Bottom Quartile</b>			
National Water Utility Peers		667	456	333
Western U.S. Water Utility Peers		635	422	349
Water Utility Peers with 500k + Customers		794	653	428
<b>Number of MGD processed per Employee</b>	<b>0.28</b>			
<b>(See Note A)</b>	<b>Near Median</b>			
National Water Utility Peers		0.33	0.24	0.15
Western U.S. Water Utility Peers		0.40	0.26	0.17
Water Utility Peers with 500k + Customers		0.51	0.34	0.24
<b>Average Residential Monthly Charge for Water</b>	<b>\$44.54</b>			
<b>(See Note A)</b>	<b>Bottom Quartile</b>			
National Water Utility Peers		\$21.44	\$26.41	\$32.04
Western U.S. Water Utility Peers		\$21.77	\$27.75	\$33.84
Water Utility Peers with 500k + Customers		\$16.75	\$23.20	\$27.64
<b>System Renewal Replacement % - System Pipeline</b>	<b>2.3%</b>			
	<b>Near Median</b>			
National Water Utility Peers		6.4%	2.5%	1.3%
Western U.S. Water Utility Peers		8.6%	2.0%	0.8%
Water Utility Peers with 500k + Customers		7.0%	4.1%	1.3%
<b>System Renewal Replacement % - Treatment &amp; Pumping Facilities</b>	<b>9.2%</b>			
	<b>Top Quartile</b>			
National Water Utility Peers		7.7%	3.2%	1.7%
Western U.S. Water Utility Peers		15.1%	3.4%	2.1%
Water Utility Peers with 500k + Customers		12.4%	5.0%	2.1%

## Comparison

	FY 2008 Data for San Diego's Water Dept.	2007 Peer Group Top Quartile Average	2007 Median	2007 Peer Group Bottom Quartile Average
<b>Water System Distribution Water Loss %</b>	<b>9.3%</b>			
	<b>Near Median</b>			
National Water Utility Peers		4.9%	8.6%	12.4%
Western U.S. Water Utility Peers		3.8%	7.2%	10.4%
Water Utility Peers with 500k + Customers		6.4%	9.9%	15.0%
 <b>Operations &amp; Maintenance Costs - per Customer Account (See Note A)</b>				
	<b>\$632</b>			
	<b>Bottom Quartile</b>			
National Water Utility Peers		\$205	\$272	\$357
Western U.S. Water Utility Peers		\$252	\$339	\$443
Water Utility Peers with 500k + Customers		\$163	\$233	\$319
 <b>Operations &amp; Maintenance Costs - per Million Gallons of Water Delivered (See Note A)</b>				
	<b>\$2,165</b>			
	<b>Bottom Quartile</b>			
National Water Utility Peers		\$1,037	\$1,506	\$2,310
Western U.S. Water Utility Peers		\$1,163	\$1,608	\$2,509
Water Utility Peers with 500k + Customers		\$885	\$1,320	\$1,665
 <b>Direct Treatment Cost per Million Gallons of Water</b>				
	<b>\$87</b>			
	<b>Top Quartile</b>			
National Water Utility Peers		\$100	\$322	\$550
Western U.S. Water Utility Peers		\$75	\$234	\$558
Water Utility Peers with 500k + Customers		\$117	\$301	\$517
	 <b></b>			

## Comparison

	FY 2008 Data for San Diego's Water Dept.	2007 Peer Group Top Quartile Average	2007 Median	2007 Peer Group Bottom Quartile Average
<b>Number of leaks and/or pipeline breaks - per 100 miles of pipeline system</b>	<b>3.2</b>			
	<b>Among the Best in the Top Quartile</b>			
National Water Utility Peers		21.7	34.3	56.1
Western U.S. Water Utility Peers		15.8	31.2	53.0
Water Utility Peers with 500k + Customers		31.2	48.7	115.8
<b>Drinking Water Compliance Test</b>	<b>100%</b>			
	<b>Top Quartile</b>			
National Water Utility Peers		100%	100%	100%
Western U.S. Water Utility Peers		100%	100%	100%
Water Utility Peers with 500k + Customers		100%	100%	100%

NOTE A - The San Diego Water Department's performance in this comparison is adversely impacted by one or more of the material challenges cited elsewhere in the Annual Performance Report for the Fiscal Year Ended June 30, 2008 for the San Diego Water Department.

# APPENDIX T

## *Annual Performance Report for the fiscal year ended June 30, 2008 for San Diego's Metropolitan Wastewater Department*

In developing the first annual performance report on San Diego's Metropolitan Wastewater Department (MWWD), IROC believed that we needed to measure certain key elements of the Department's performance over time, on a measurable or statistic basis, as well as to measure the current fiscal year's (FY 2008) performance of the Department against several recognized industry or peer group operating performance benchmarks.

Additionally, as part of the Annual Performance Report, we also chose to evaluate the Metropolitan Wastewater Department's Quality of Service based on a group of measures specifically selected by IROC, that we believe matter to the wastewater system ratepayers of San Diego.

### **Comparison of San Diego Wastewater Department Operating Performance Statistics with peer groups of other water utilities**

In order to gauge the comparative operating performance of MWWD in relation to the operating performances of wastewater utilities located in other communities, IROC chose a series of performance measurements and utility peer groupings from surveys conducted and published by the American Water Works Association (AWWA). The latest available survey data available from AWWA was as of 2007. Accordingly, AWWA's 2007 survey data was used in comparison to the fiscal year 2008 data reported to IROC by the San Diego's Metropolitan Wastewater Department.

AWWA's 2007 survey compared performance statistics among a group of 180 utilities (60 water-only providers, 14 wastewater-only entities and 106 combined water / wastewater utilities). Of the total 180 utilities, 49 were located in the western part of the nation. Of this number, a total of 17 were water-only utilities, 5 were wastewater only entities and the remaining 27 were combined water/wastewater utilities. In terms of size of organization, a total of 20 of the entities included in the survey serve communities with populations greater than 500,000 people. Of these larger entities, 6 were wastewater-only utilities and the remainder was combined water/wastewater entities.

As the following comparisons disclose, IROC chose to compare MWWD with three distinct peer groups of water utilities: 1) all wastewater utilities included within the AWWA survey regardless of size or location in the U.S.A. (national peers); 2) all wastewater utilities, without regard to their size, included in the AWWA survey located only in the Western U.S.A.; and, 3) all wastewater utilities included within the AWWA survey that serve only communities with populations greater than 500,000 people located anywhere in the U.S.A.

IROC's development of operating performance comparisons between San Diego's Metropolitan Wastewater Department and the three AWWA peer groupings (see pages 66 to 68) disclosed the following comparative results.

## Operating Performance Measurement

Number of Customers per Employee	- The MWWD number would rank in the <b>bottom quartile</b> of the three peer groupings
Number of MGD Processed per Employee	- The MWWD number would rank <b>near the median</b> of the three peer groupings
Average Residential Monthly Charge	- The MWWD number would rank in the <b>bottom quartile</b> of the three peer groupings
System Pipeline Renewal / Replacement %	- The MWWD number would rank <b>near the median</b> of the three peer groupings
Treatment and Pumping Facilities Renewal/ Replacement %	- The MWWD number would rank <b>between the median and the bottom quartile</b> of the three peer groupings
Operations & Maintenance Costs per Customer Account	- The MWWD number would rank in the <b>bottom quartile</b> of the three peer groupings
Operations & Maintenance Costs per Million Gallons Processed	- The MWWD number would rank <b>near the median</b> of the three peer groupings
Direct Treatment Cost per Million Gallons Processed	- The MWWD number would rank <b>between the top quartile and the median</b> of the three peer groupings
Number of System Failures (leaks and pipeline breaks) per 100 Miles of Pipeline System	- The MWWD number would rank in the <b>top quartile</b> of the the three peer groupings
Number of Sewer System Overflows per 100 miles of pipeline system	- The MWWD number would rank in the <b>top quartile</b> of the three peer groupings
Wastewater Treatment Effective Rate	- The MWWD number would rank <b>near the median</b> of the Three peer groupings

- Among the preceding operational performance measurement comparisons there were a number in which San Diego's Metropolitan Wastewater Department's performance measurement would have ranked in the **bottom quartile** of the three peer groupings. Preliminarily, it appeared to IROC that each of these rankings might result from the related component of departmental operating costs being higher than it should be in comparison to similar costs being incurred by the members of the peer groups.
- For example, the comparative results for the number of customer accounts per employee implies that the number of MWWD employees is higher than they otherwise should be, based on the peer group ratios. However, on a MGD of



water processed per employee basis, MWWD's employee number appears to fall in line with the median performance of the peer groups.

- The Average monthly billing for wastewater services for San Diego in comparison to peer group data is quite high. The source of this significant variance from peer group amounts for average water service billings appears to arise from MWWD's significantly higher Operations and Maintenance expense ratios in comparison to the peer groups.
- The comparative results for the Operations & Maintenance expense as allocated over the number of customer accounts implies that San Diego's Operations & Maintenance expense are higher than they otherwise should be based on the peer group ratios. However, on a MGD of water processed basis, MWWD's Operations and Maintenance expense number appears to fall in line with the median performance of the peer groups.

From the above information, IROC concluded that it needed to obtain a better understanding of what might be causing MWWD's comparatively higher Operations & Maintenance costs and, if possible, to determine whether there are steps that can be taken to improve MWWD's comparative Operations & Maintenance cost performance as well as those other comparisons in which MWWD ranked in the Bottom Quartile. IROC regards each of these items to be of critical importance to the Wastewater Ratepayers of San Diego.

In the performance of IROC's overall reviews and analysis of the MWWD, the following items were noted, which we believe materially explain and support the higher than peer group results for: Operations and Maintenance Expense level; employee to customer account ratio; and higher than peer group monthly residential wastewater charges.

**Material challenges that adversely impact the operating efficiency of San Diego's Metropolitan Wastewater Department in comparison to those of other wastewater utilities.**

- 1) San Diego has a proportionally larger system geographic size requirement, on a per capita basis, than other major wastewater systems in California and in the nation. This results from a greater geographic dispersion of the customers being served by the system as expressed in terms of customer population density per square mile of service area. Appendix C to this report contains comparative analyses of the geographic footprint San Diego's wastewater system versus the other members of the ten largest cities in California and the ten largest cities in the nation.
- 2) In the course of our review of the MWWD we noted a rather high employee benefit expense percentage allocation (in comparison to the applicable salaries expense allocations associated with such employee benefit expense) being charged to the MWWD. We noted that this comparatively high benefits expense ratio also existed within all of the Service Level Agreements involving the Water Department as a payer or receiver of payments for services rendered between the MWWD and other City of San Diego departments or agencies. See Appendix G

for the results of IROC's review of these Service Level Agreements. We understand that the cause of such higher than expected employee benefit expense allocations are due to a need for the City to address major employee pension and possible other employee benefit funding shortfalls of prior years in addition to current period employee benefit plan expense. The causes of such shortfalls have received extensive disclosure in the media since 2004 and are not arising from any areas under the control or scope of responsibility of the MWWD. Since the employees of the MWWD are fully included in the City's historic and current employee benefit plans, such "catch-up" allocations, although an added operational cost burden at this time, are required under generally accepted accounting principles.

- 3) A credit rating disadvantage in comparison to other large water utilities which adversely can impact the interest rate costs of the MWWD public and private placement borrowings for funding multi-year infrastructure replacement, enhancement and expansion projects. Appendix B to this Report provides comparative Credit Ratings for San Diego and for a number of other major U.S. Cities. In view of the material scope of MWWD's capital project financings in comparison to Annual Department service charge revenues received from ratepayers and from other wastewater agencies served (roughly \$317 million in fiscal year 2008), a small variance in the annual interest rate cost of the Department's borrowings can have a meaningful effect on the MWWD's overall costs. As of June 30, 2008, MWWD had outstanding borrowings of \$ 1.2 billion and is projecting to accomplish approximately \$ 632 million of capital investment projects in the four year period ending June 30, 2012. Approximately 80% of these projected capital expenditures are required to achieve or maintain compliance with an Environmental Protection Agency issued consent decree. The \$632 million projected capital expenditures are expected to be 80% funded by new borrowings, as needed.

In IROC's opinion, the collective impact of these three material factors adequately explains the comparative performance disadvantage with regard to each of the measures in which MWWD's operating performance would place in the bottom quartile of the respective peer groupings.

### **Review of Operational Performance Trends within the San Diego Metropolitan Wastewater Department**

IROC chose to analyze the five-year trends in the major operational expense components of MWWD's annual expenditures expressed in terms of the cost as measured per Millions of Gallons of wastewater processed during each respective fiscal year. For these purposes, the trend in CIP expenditures and bond payments were excluded from further analysis. Because of variations in the grouping of certain expenses in fiscal years prior to FY 2005, in comparison to expense groupings reported starting with fiscal year 2005, all expense information from Fiscal Year 2004 was excluded from the five-year trend analysis in this report.

## Millions of Gallons of Wastewater Processed

FY 2004	73,481
FY 2005	79,010
FY 2006	74,310
FY 2007	72,111
FY 2008	72,308

The amount of wastewater processed in FY 2005 was higher than normal due to higher than normal rainfall during that fiscal year.

Expense (In \$ thousands)	FY 2005	FY 2006	FY 2007	FY 2008
Bond Payments	\$ 84,252	85,748	95,317	93,457
Personnel + Costs*	71,087	70,987	68,441	69,429
Pension Expense	13,322	15,928	16,075	17,291
Other Expenses**	122,356	115,624	110,914	116,786
	-----	-----	-----	-----
Total Expenditures	\$291,017	\$288,287	\$290,747	\$296,963

The following shows the above amounts expressed as a percentage of total expenditures:

	FY 2005	FY 2006	FY 2007	FY 2008
Bond Payments	29.0	29.7	32.8	31.5
Personnel + Costs	24.4	24.6	23.5	23.4
Pension Expense	4.6	5.5	5.5	5.8
Other Expenses**	42.0	40.1	38.1	39.3
	-----	-----	-----	-----
Total Expenditures	100.0%	100.0%	100.0%	100.0%

\* Personnel expense including wages and fringe benefit costs (except for pension related expense).

\*\* Includes the sum of all other operating expenses as well as CIP expenditures incurred during the fiscal year by the Wastewater Department.

### Trend in Personnel Expense as measured per Millions of Gallons of wastewater processed

<u>Fiscal Year</u>	<u>\$ / MGD</u>	<u>% Change from Prior Year</u>
2005	\$ 900	---
2006	955	6.1%
2007	949	(0.1%)
2008	960	1.1%

### Trend in Pension Expense as measured per Millions of Gallons of wastewater processed

<u>Fiscal Year</u>	<u>\$ / MGD</u>	<u>% Change from Prior Year</u>
2005	\$ 169	---
2006	214	26.6%
2007	223	4.2%
2008	239	7.2%

## **Trend in Other Expenses as measured per Millions of Gallons of wastewater processed**

<u>Fiscal Year</u>	<u>\$ / MGD</u>	<u>% Change from Prior Year</u>
2005	\$1,549	---
2006	1,556	0.5%
2007	1,538	(1.2%)
2008	1,615	5.0%

The above four-year trends in expense show a pattern of significant annual increases in Pension Cost Expenses for MWWD. This cost is not under the direct control of MWWD.

Fiscal Year 2008 Personnel Expense was affected by a 4% annual salary increase that became effective early in fiscal year 2008.

## **Evaluating the Metropolitan Wastewater Department's Quality of Service**

IROC chose the following items to provide it with a measurement of the Department's quality of service during fiscal year 2008.

Status of MWWD's Wastewater Treatment Effectiveness Rate, after consideration of permit limit exclusions. The Department's Point Loma Wastewater Treatment Plant was non-compliant for portions of two (2) of the 366 days in fiscal year 2008 (99.5% in compliance). The results for the Department's South Bay Water Reclamation Plant (SBWRP) are complicated by the migration of effluent from the neighboring IBWC Wastewater Treatment Plant (which is not under the control of or part the SBWRP, but shares the South Bay Ocean Outfall with SBWRP, from which the compliance test samples are drawn). Excluding the impact of the effluent from the IBWC WTP, SBWRP would have recorded 100% compliance (no non-compliant days during fiscal year 2008). With the effluent from IBWC WTP included in the testing results, SBWRP reported 53 days of non-compliance in fiscal year 2008 or a compliance rate of 85.5%.

Summary of the number of wastewater spills that occurred and an estimate of the aggregate volume of wastewater released in these incidents during fiscal year 2008 in comparison to the four prior years' results:

	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008
# of Wastewater Spills	115	96	71	85	69
Estimated wastewater discharged (in thousands of gallons)	5,413	2,111	84	96	440

The reduction in the estimated volume of water discharged in each fiscal year since 2005 represents a significant accomplishment for MWWD personnel. The reduction in the number of wastewater spills in FY 2008 is also a positive result. The significant increase in the volume of wastewater discharged in FY 2008 resulted from one large spill that occurred in August 2007 which released approximately 390,000 gallons of wastewater. This one event produced 88.6% of FY 2008 total volume of wastewater discharged.

The number of spills that impacted public waters during the fiscal year and the aggregate estimate of wastewater spilled as measured in gallons of wastewater. There were eleven (11) public water sanitary sewer overflows during FY 2008. These 11 spills resulted in the discharge of approximately 397 thousand gallons of wastewater into public waters.

What was the amount of time between the identification and resolution for each of the reported wastewater spills that impacted public waters during FY 2008? All eleven occurrences were responded to in 30 minutes or less. The average resolution time for 10 of the 11 incidents was approximately four (4) hours. One large incident at Lake Hodges required approximately 13 hours to resolve.

Percentage of the overall sewer pipeline system cleaned during FY 2008. 1,455 miles of pipeline which represents 48.6% of the entire system.

### **Summary evaluation of the Metropolitan Wastewater Department's performance for fiscal year 2008**

Based on the preceding five year trend analyses, comparative peer analyses, quality of service measurements and the additional research and analyses we have performed in other sections of IROC's Annual Report for fiscal year 2008, we rate the operational performance of San Diego's Metropolitan Wastewater Department for fiscal year 2008, **Acceptable**.

A rating higher than Acceptable (such as excellent or above average) was not considered in view of the previously mentioned material challenges that adversely impact the operating efficiency of MWWD in comparison to those of other wastewater utilities and the impact of such factors on the overall operating costs of MWWD as reflected in the monthly billings to wastewater ratepayers. In the opinion of IROC, the management and staff of the San Diego's Metropolitan Wastewater Department are performing admirably in the face of such challenges, however, San Diego wastewater ratepayers, in comparison to wastewater ratepayers in other communities, are and will continue to be burdened by these material challenges.

Based on the work we have performed, we have a much greater understanding of the challenges faced daily and prospectively by the management and staff of the MWWD. We commend them for their efforts and their performance. However, we would encourage the Management of the Metropolitan Wastewater Department and the Policy Makers having authority over the Department to actively pursue opportunities to reduce the effective cost of supplying water to the ratepayers of San Diego and have included in Appendix A of IROC's Annual Report for fiscal year 2008 a series of recommendations to assist them in their pursue of such opportunities.

## Comparison

	FY 2008 Data for San Diego's Metropolitan Wastewater Dept.	2007 Peer Group Top Quartile Average	2007 Median	2007 Peer Group Bottom Quartile Average
<b>Number of Customers per Employee</b>	<b>370</b>			
<b>(See Note A)</b>	<b>Bottom Quartile</b>			
National Wastewater\Sewer Utility Peers		809	555	378
Western U.S. Wastewater\Sewer Utility Peers		901	646	426
Wastewater Utility Peers with 500k + Customers		688	548	457
<b>Number of MGD processed per Employee</b>	<b>0.24</b>			
<b>(See Note A)</b>	<b>Near Median</b>			
National Wastewater\Sewer Utility Peers		0.36	0.27	0.20
Western U.S. Wastewater\Sewer Utility Peers		0.33	0.22	0.17
Wastewater Utility Peers with 500k + Customers		0.36	0.25	0.18
<b>Average Residential Monthly Charge for Wastewater Services (See Note A)</b>	<b>\$38.43</b>			
<b>(See Note A)</b>	<b>Bottom Quartile</b>			
National Wastewater\Sewer Utility Peers		\$18.85	\$26.25	\$33.25
Western U.S. Wastewater\Sewer Utility Peers		\$18.26	\$25.96	\$39.25
Wastewater Utility Peers with 500k + Customers		\$18.26	\$29.60	\$36.08
<b>System Renewal Replacement % - System Pipeline</b>	<b>2.1%</b>			
<b>(See Note A)</b>	<b>Near Median</b>			
National Wastewater\Sewer Utility Peers		7.4%	3.1%	0.7%
Western U.S. Wastewater\Sewer Utility Peers		8.0%	2.6%	0.8%
Wastewater Utility Peers with 500k + Customers		7.2%	2.7%	1.0%
<b>System Renewal Replacement % - Treatment &amp; Pumping Facilities</b>	<b>2.3%</b>			
<b>(See Note A)</b>	<b>Near Median</b>			
National Wastewater\Sewer Utility Peers		5.0%	3.3%	1.9%
Western U.S. Wastewater\Sewer Utility Peers		10.9%	3.4%	1.2%
Wastewater Utility Peers with 500k + Customers		5.0%	3.3%	1.1%

## Comparison

	FY 2008 Data for San Diego's Metropolitan Wastewater Dept.	2007 Peer Group Top Quartile Average	2007 Median	2007 Peer Group Bottom Quartile Average
<b>Operations &amp; Maintenance Costs -</b>	<b>\$897</b>			
<b>per Customer Account (See Note A)</b>	<b>Bottom Quartile</b>			
National Wastewater\Sewer Utility Peers		\$222	\$302	\$418
Western U.S. Wastewater\Sewer Utility Peers		\$133	\$213	\$343
Wastewater Utility Peers with 500k + Customers		\$120	\$209	\$303
<b>Operations &amp; Maintenance Costs - per</b>	<b>\$1,623</b>			
<b>Million Gallons of Water Delivered (See Note A)</b>	<b>Near Median</b>			
National Wastewater\Sewer Utility Peers		\$1,067	\$1,960	\$2,615
Western U.S. Wastewater\Sewer Utility Peers		\$1,523	\$2,293	\$3,398
Wastewater Utility Peers with 500k + Customers		\$906	\$1,500	\$1,859
<b>Direct Treatment Cost -</b>	<b>\$736</b>			
<b>per Million Gallons Processed</b>	<b>Top Quartile</b>			
National Wastewater\Sewer Utility Peers		\$622	\$924	\$1,471
Western U.S. Wastewater\Sewer Utility Peers		\$630	\$1,080	\$1,630
Wastewater Utility Peers with 500k + Customers		\$569	\$676	\$987
<b>Number of leaks and/or pipeline breaks -</b>	<b>3.2</b>			
<b>per 100 miles of pipeline system</b>	<b>Top Quartile</b>			
National Wastewater\Sewer Utility Peers		0.9	5.4	10.1
Western U.S. Wastewater\Sewer Utility Peers		0.9	4.0	12.5
Wastewater Utility Peers with 500k + Customers		6.2	15.0	41.6
<b>Number of sewer system overflows -</b>	<b>2.3</b>			
<b>per 100 miles of pipeline system</b>	<b>Above Median</b>			
National Wastewater\Sewer Utility Peers		0.90	3.00	5.20
Western U.S. Wastewater\Sewer Utility Peers		0.49	2.04	3.85
Wastewater Utility Peers with 500k + Customers		1.79	6.09	9.72

## Comparison

	FY 2008 Data for San Diego's Metropolitan Wastewater Dept.	2007 Peer Group Top Quartile Average	2007 Median	2007 Peer Group Bottom Quartile Average
<b>Wastewater Treatment Effective Rate</b>	<b>99.7%</b>			
	<b>Near Median</b>			
National Wastewater\Sewer Utility Peers		100%	99.7%	99.5%
Western U.S. Wastewater\Sewer Utility Peers		100%	99.9%	98.6%
Wastewater Utility Peers with 500k + Customers		100%	100%	97.4%

NOTE A - The San Diego Metropolitan Wastewater Department's performance in this comparison is adversely impacted by one or more of the material challenges cited elsewhere in the Annual Performance Report for the Fiscal Year Ended June 30, 2008 for the San Diego MWWD.