

City of San Diego Pure Water Project

October 2014

SDCTA Position:

SUPPORT

Rationale for Position:

Substantial study has demonstrated a potable reuse project within the City of San Diego would be safe, save substantial ratepayer dollars over time, and bring increased water reliability for residents and businesses alike.

Title: Pure Water Project

Jurisdiction: City of San Diego

Type: Capital Improvement Project

Vote: City Council Majority

Status: Conceptual

Issue: Water Recycling

Description: In a phased approach, allowing for modifications as state regulations are adopted and project specific realities are uncovered, the City of San Diego Public Utilities Department is proposing a potable reuse project branded “Pure Water.” The project would include a 15 million gallons-per-day (mgd) facility at North City Reclamation Plant by 2023, an additional 15 mgd facility at the South Bay Reclamation Plant by 2027, and an additional 53 mgd facility at Harbor Drive by 2035 paid for by rate increases.

Fiscal Impact: Any City of San Diego expenditures beyond those funded with state and/or federal grants will be recovered through water rates and wastewater rates. Project expenditures are projected at \$3.1 billion through 2023 and provide ongoing savings by decreasing flows through the wastewater system and postponing federally required improvements to the Point Loma Wastewater Treatment Plant. Over 5 years, the estimated rate increases ranged between a cumulative 7.6 percent and 8.9 percent for water rates, and between a cumulative 5.9 percent and 6.3 percent for wastewater rates.

Background:

San Diego’s Potable Water Use

According to the SANDAG’s 2050 Regional Growth Forecast (2010), it is projected that the population within San Diego County will increase by over one million people by 2050. Even with considerable conservation, this growth will require increased water supply.

The city purchases all of its imported water from the Water Authority, which continues to diversify its sources as to be less reliant on the Metropolitan Water District (MWD) of Southern California. MWD water is a blend of Colorado River and California State Project Water. Ultimately, San Diego currently imports 80 to 90 percent of its drinking water.

The water purchased by the City of San Diego is “raw” water that must be treated at one of the City’s three drinking water treatment plants: Miramar, Alvarado, and Otay.

Indirect Potable Reuse

Indirect Potable Reuse (IPR) is defined as the blending of advanced treated recycled water into a natural source known as an “environmental buffer,” either a groundwater basin or reservoir that could then be used for drinking or potable water after further treatment. The term “indirect” refers to the distinction that highly-treated recycled water is not delivered directly to the potable water distribution system. IPR projects require extensive permitting and regulatory oversight.

1993 Water Repurification Project

Plans to develop indirect potable reuse options for the city were cancelled in 1999 due to public opposition cultivated during some closely contested political campaigns in 1998. More specifically, that plan, known as the 1993 Water Repurification Project proposed an IPR project which would take recycled water from the North City Water Reclamation Plant, deliver it to a new facility for tertiary treatment using several advanced technologies, including membrane filtration, reverse osmosis, ion exchange, advanced oxidation using ozone and disinfection. The “repurified” water would be pumped 20 miles to the San Vicente Reservoir, blended with imported and local water, stored for two years (where further natural treatment would occur), and then sent to the Alvarado Water Treatment Plant before distribution to customers.

In January 2004, the City Council instructed the City Manager to conduct a study to evaluate options for increasing the beneficial use of recycled water. A process then began which included the creation of a team of City staff and consultants, the hosting of stakeholder workshops and the selection of an Independent Advisory Panel (IAP) contracted through the National Water Research Institute (NWRI). In March 2006, the IAP presented the final draft report of the “City of San Diego Water Reuse Study” to the City Council.

The City’s Demonstration Project

In November of 2008, the San Diego City Council approved a temporary water rate increase necessary for the City of San Diego (City) to conduct a Water Reuse Demonstration Project (Project) study. The Demonstration Project facility has been in operation since July of 2011 and has been used to evaluate advanced water purification technology as a means of supplementing existing drinking water sources.¹ The project included a study of San Vicente Reservoir, research to determine a pipeline alignment, a public outreach education program and the construction and operation of a pilot scale advanced water purification facility.

In 2013, the City Council to adopted the Water Purification Demonstration Project Report in fulfillment of the elements outlined in Council actions approved prior to the 2007 temporary rate increase. The Council actions at that time, directed staff to conduct the Indirect Potable Reuse/Reservoir Augmentation Demonstration Project, which evaluated the feasibility of augmenting San Vicente Reservoir with advanced treated purified water.² The analysis included operating a one million gallon per day (MGD) water purification facility, convening an expert advisory panel, studying San Vicente Reservoir, defining

¹ Letter to Assemblyman Hueso from the City of San Diego. “AB 2398 (Hueso) – Water recycling: SUPPORT”. May 21, 2012.

² “[Water Purification Demonstration Project, Project Report](#)”. Council Action Executive Summary Sheet. 12/26/2012

regulatory requirements, conducting an energy and economic analysis, studying potential pipeline alignments, and implementing a comprehensive public outreach program.

Senate Bill 918 (2010)

In 2010, Senate Bill (SB) 918 was passed into law requiring the Department of Public Health to establish standards for various types and uses of recycled water including recycled water augmentation of reservoirs by December 31, 2016 and report on the feasibility of doing the same for direct potable reuse by the same date. As part of this process, an expert advisory panel is to be assembled and conclude whether or not the criteria protects the public health.

The 2012 Recycled Water Study

The 2012 Recycled Water Study was produced by the City to satisfy the legally binding cooperative agreement made by the City with Coastkeeper and Surfrider in early 2009. It was designed to serve as a guidance document for decision-makers addressing different recycled water approaches, and how they impact all of the region’s water and wastewater infrastructure. It does not call for specific projects to be built, but explores opportunities.

The report lays out five “integrated reuse alternatives” to guide future implementation. They were created through a stakeholder process aiming to develop plan alternatives to meet a 106 Million Gallons-per-day (MGD) water reuse target.

The alternatives include new **advanced treatment facilities** at five possible sites. Each alternative achieves:

- Total average-daily reuse: 106 mgd
- Total average-daily Point Loma Offload: 135 mgd
- Total resultant average-daily flow to Point Loma: 143 mgd

The report estimates not only the gross cost of each alternative, but also the net cost after considering different levels of associated savings. The following table describes what savings are included in each “Tier.”

Figure 1: Descriptions of Savings Included in Each Tier of “Net Costs”

Cost Level	Description
Gross Costs	Gross costs include the capital and O&M costs for completing and operating the recycled water projects. It does not account for reduced capital and O&M expenses at downstream facilities or other benefits/credits.
Tier 1 Net Costs Direct Wastewater System Savings	With the proposed reuse program, flows to downstream facilities are less, resulting in lower capital and operating costs. Tier 1 shows the reuse cost with these adjustments. (Point Loma Plant, Pump Station 1, Pump Station 2).
Tier 2 Net Costs Salt Reduction Credit	The IPR projects substantially reduce salinity/TDS which lowers operating costs in the downstream water and wastewater systems (there is also a customer benefit treated qualitatively).
Tier 3 Net Costs Indirect Wastewater Savings (CEPT)	The reuse program will reduce mass emissions at Point Loma. This cost tier summarizes the net costs if the reuse program contributes to maintaining chemically enhanced primary treatment at Point Loma.

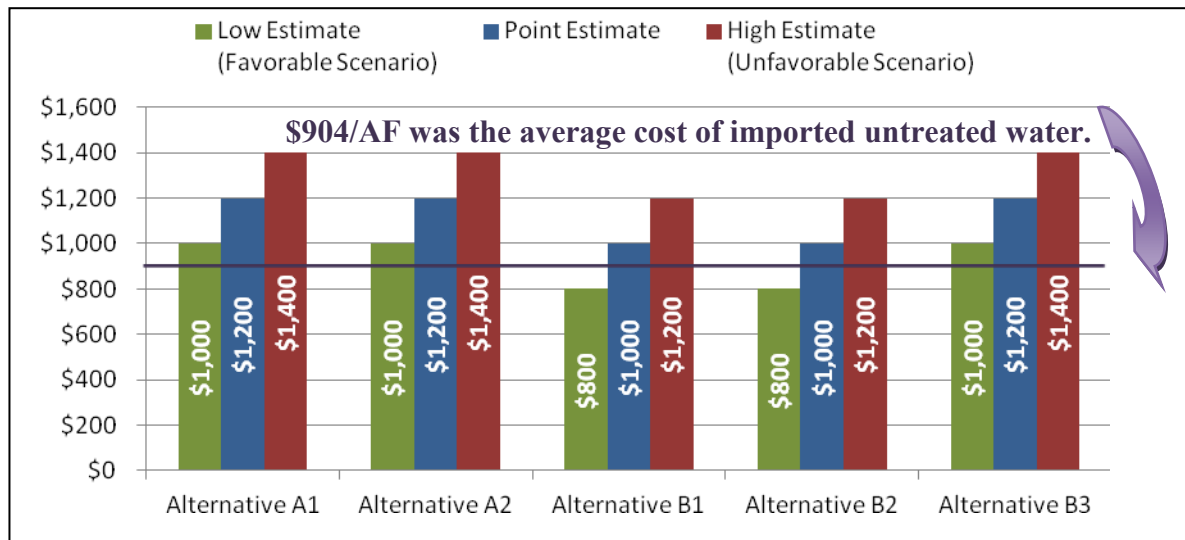
Source: Recycled Water Study

The Tier 2 and Tier 3 net costs incorporate the related quantifiable savings under two different circumstances. Tier 3 net costs includes savings “associated with leaving Point Loma as a chemically-enhanced primary treatment plant and foregoing secondary upgrades all together.”³³ Some believe that the Point Loma upgrade to secondary treatment may only be delayed by a new waiver that accepts moving forward on a potable reuse project as progress in reducing discharge at Point Loma. Tier 3 net costs should be understood to be a description of the lowest net cost possible. Further benefits treated as qualitative, and thus not included in these figures, are benefits such as reliability of supply.

For the full life-cycle costs of each alternative, a net present value calculation was performed and turned into a cost-per-acre-foot (AF) figure for comparison. The cost estimates are inclusive of all costs including initial investments and O&M.

At the time, the average cost of importing untreated water was \$904/AF. They also performed sensitivity analyses including favorable and unfavorable scenarios. The conclusion was that any of the alternatives could provide a net price comparable to the current average price of imported water, and less than projected rates of imported water.

Figure 2: 2012 Recycled Water Study Tier 2 Net Costs of Each Alternative

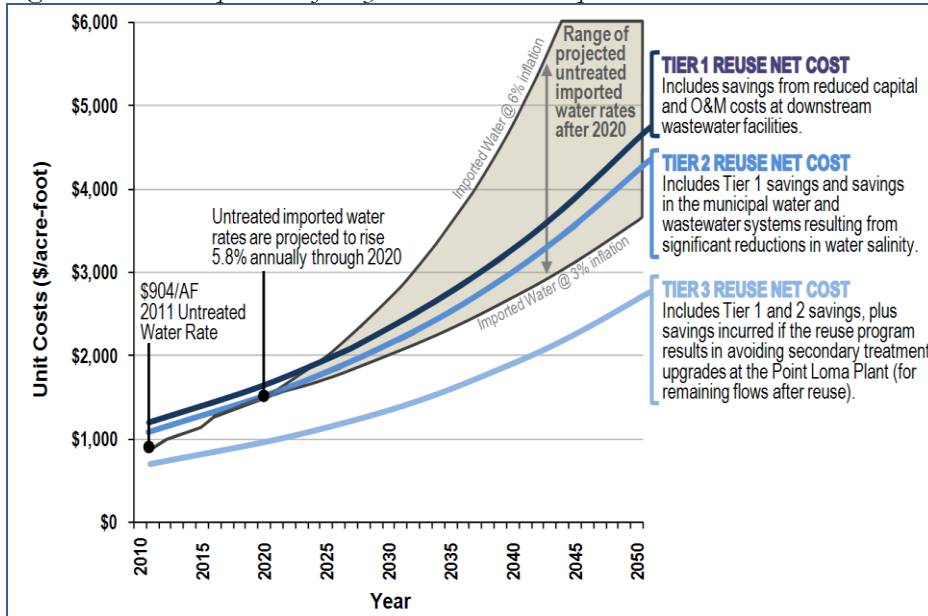


Source: SDCTA, Estimates from 2012 Recycled Water Study

While Tier 2 net cost estimates were generally more than the then-current cost of imported water, it will not be more expensive after imported rates rise as they are expected to. The current cost of imported untreated water has already risen significantly. The following figure is from the Draft Recycled Water Study, and demonstrates how the estimated costs compare to projected rates into the future. It demonstrates that recycled water is expected to be more cost-effective in all but the most optimistic scenario.

³ Report to City Council June 12, 2012 – Report #12-073

Figure 3: Cost Comparison of Recycled Water and Imported Water



Source: 2012 Recycled Water Study

California Department of Public Works Regulations

As the City moves forward with the IPR project, the California Department of Public Health (DPH) is concurrently embarking on discussions as to the regulatory development requirements for indirect potable reuse/reservoir augmentation projects. Prior to Assembly Bill (AB) 322, the State was not on schedule to create the regulations pursuant to SB 918. Until these regulations are adopted, each project that would fall under these categories need to achieve approval from DPH on a case-by-case basis making planning more difficult as seen in a December 2009 letter to the City in which DPH states,

“There are also several outstanding technical issues related to the subject of surface water augmentation that the demonstration project will need to address, such as the level of advanced treatment necessary along with appropriate monitoring and contingency plans.”

More recently, in a September 2012 letter to the City, DPH states:

“Based on CDPH’s review of the City’s March 22, 2012, submittal, CDPH has concluded that the project, as conceived, when properly designed, constructed, and operated, will not compromise the quality of the water derived from the San Vicente Reservoir. Therefore, CDPH approves the San Vicente Reservoir Augmentation Concept.”

SDCTA Past Position

In June of 2012, the SDCTA Board of Directors adopted three principles for support of recycled water regulation reforms. This was done using the following rationale:

“State of California law is antiquated when it comes to how recycled water is treated. Policy makers and the general public are ready to side with science and have gotten over the “yuck factor.” Advanced Treated Purified Water is not waste, and should not be defined as such. Because this

legislation allows for fees to recoup expenses without specifying their levels, we should proceed with caution as fees could be set so high as to discourage future projects. Revising law that was influenced by since diminished fear of recycled water should be a priority.”

The three principals developed by SDCTA were:

- **Advanced Treated Purified Recycled Water Should be Regulated as a Source Rather than a Waste** – Regulation should not be based on unsubstantiated fear, but rather scientific evidence. When it is used as a raw water source for drinking water, it should be regulated as such, and by the government agency designated with performing this duty: the California Department of Public Health.
- **Lower Net Expected Costs of Projects** – Any increase in expected permitting and monitoring fees should be less than the expected savings achieved through avoiding other permitting or regulations, or by avoiding the construction of additional infrastructure.
- **Goals Should Not be Treated as Mandates** – It must be clear that no penalties are to be assessed for failure to meet regulations designed to achieve water recycling goals. If regulations are allowed to be used to achieve recycling goals, they should be incentive-based.

In addition, it is important to note SDCTA’s role as Co-Chair of the Water Reliability Coalition which is a broad coalition of business, environmental, and ratepayer advocates aimed at promoting the exploration of Indirect Potable Reuse in the City of San Diego.

Proposal:

In a phased approach, allowing for modifications as state regulations are adopted and project specific realities are uncovered, the City of San Diego Public Utilities Department is proposing a potable reuse project branded “Pure Water.” The project would include a 15 million gallons-per-day (mgd) facility at North City Reclamation Plant by 2023, an additional 15 mgd facility at the South Bay Reclamation Plant by 2027, and an additional 53 mgd facility at Harbor Drive by 2035 at a projected cost of \$3.1 billion.

Figure 4: Project Facilities, Schedule and Cost

Facilities	Start	End	Capital Costs	Total Costs
North City Phase	2015	2024	\$223,040,000	\$388,091,411
North City Advanced Water Purification Facility			\$78,320,000	\$136,277,436
IPR Pipeline North City (Segment A)			\$58,860,000	\$102,416,878
Pump Station (IPR) North City to Point E (Multiple Pump Stations, Forebay)			\$32,660,000	\$56,828,665
IPR Pipeline North City / Harbor Drive Combination			\$28,380,000	\$49,381,430
Pump Station (IPR) Booster for North City at Point F to San Vicente Reservoir			\$14,430,000	\$25,108,317
IPR Pipeline North City (Segment B)			\$6,310,000	\$10,979,451
Pump Station (Tertiary) North City to North City Advanced Water Purification Facility			\$3,880,000	\$6,751,232
North City Forcemain from Tertiary to Advanced Water Purification Facility			\$200,000	\$348,002
South Bay Phase	2018	2026	\$589,630,000	\$1,025,960,989
South Bay Water Reclamation Plant Preliminary - Secondary - Phase 1			\$155,670,000	\$270,867,064
South Bay Water Reclamation Plant Solids Processing Facility			\$143,020,000	\$248,855,962
Pump Station (Wastewater) Spring Valley No. 8 Metro Wastewater Connection to South Bay Water Reclamation Plant			\$69,170,000	\$120,356,362
South Bay Advanced Water Purification Facility			\$64,940,000	\$112,996,127
Wastewater Forcemain from Spring Valley No. 8 Metro Wastewater Connection to South Bay Water Reclamation Plant			\$59,960,000	\$104,330,887
IPR Pipeline from South Bay Water Reclamation Plant to Otay Lakes			\$50,460,000	\$87,800,810
South Bay Water Reclamation Plant Tertiary			\$29,690,000	\$51,660,841
PS (IPR) from South Bay Water Reclamation Plant to Otay Lakes (Two Pump Stations and Forebay)			\$16,720,000	\$29,092,936
Harbor Drive Phase	2023	2033	\$945,608,000	\$1,645,365,600
Harbor Drive through Secondary Membrane Bioreactor			\$494,870,000	\$861,077,819
Harbor Drive Advanced			\$167,140,000	\$290,824,957
IPR Pipeline Harbor Drive (Segment B)			\$142,240,000	\$247,498,755
Harbor Drive Solids Pump Station to Point Loma Wastewater Treatment Plant			\$49,650,000	\$86,391,403
Pump Station (IPR) from Harbor Drive to Point E (Multiple Pump Stations, Forebay)			\$44,150,000	\$76,821,359
Pump Station (Wastewater) from Pump Station #2 into Harbor Drive Plant			\$22,440,000	\$39,045,782
Harbor Drive Solids Forcemain to Point Loma Wastewater Treatment Plant			\$13,840,000	\$24,081,712
IPR Pipeline Harbor Drive (Segment A)			\$10,110,000	\$17,591,482
Brine Line from Harbor Drive Advanced Water Purification Facility to Pump Station #2			\$685,000	\$1,191,906
Wastewater Diversion to Harbor Drive Influent Pump Station			\$483,000	\$840,424
Total			\$1,758,278,000	\$3,059,418,000

Source: SDCTA, City of San Diego Public Utilities Department

Policy Implications:

Local Ratepayers

A full cost-of-service study is needed to calculate the true impact on water and wastewater rates in the short term. Assuming substantially increasing imported water rates and considerable savings on avoided upgrades at the Point Loma Wastewater Treatment Plant, it is anticipated that any of the recycling options will produce savings to ratepayers while providing additional water reliability.

The full cost-of-service study is anticipated to be produced next year and will include general cost-of-service for the existing water system including capital upgrades, additional “pass-through” costs covering the increased costs of imported water, and additional costs associated with the County Water Authority’s seawater desalination project. In the absence of the full cost-of-service study, the City of San Diego Public Utilities Department released average rate increase estimates to support only the Pure Water recycling program. Over 5 years, the estimated increases ranged between a cumulative 7.6 percent and 8.9 percent for water rates, and between a cumulative 5.9 percent and 6.3 percent for wastewater rates. The estimates are dependent on receiving 20 percent grant funding, state revolving fund dollars, and a contingency of 30 percent.

Figure 5: Forecasted Water and Wastewater Rate Increases to Pay for Pure Water Program

	CY2016	CY2017	CY2018	CY2019	CY2020
Water Rate Increase	1%	1%	1.8% - 2.2%	1.8% - 2.2%	1.8% - 2.2%
Wastewater Rate Increase	0%	0%	0%	2.9% - 3.1%	2.9% - 3.1%

Source: City of San Diego Public Utilities Department

Fiscal Impact:

Any City of San Diego expenditures beyond those funded with state and/or federal grants will be recovered through water rates and wastewater rates. Project expenditures are projected at \$3.1 billion through 2023 and provide ongoing savings by decreasing flows through the wastewater system and postponing federally required improvements to the Point Loma Wastewater Treatment Plant.

List of Proponents:

- County Water Authority.

Proponent Arguments:

- Besides conservation, wastewater recycling is the most effective way we can ensure water reliability because it is a drought tolerant, local, and safe supply.
- Recycled water will offset the need to purchase imported water that continues to become more expensive.
- When savings are included in the calculation, the price of recycled water is competitive to imported water. Over time, recycled water will be substantially less expensive.
- The treatment methods are proven to be safe. All water has recycled in nature over and over again, and we haven’t had problems with drinking water downstream of treated wastewater discharges on the Colorado River.

List of Opponents: None known at this point.

Opponent Arguments:

- It comes from sewage which creates health concerns.
- We could compromise the drinking water stored at San Vicente.