

*Proposed Water Purchase Agreement between the
San Diego County Water Authority and Poseidon Resources*
November 19, 2012

SDCTA **supports** the proposed Water Purchase Agreement. Seawater desalination is one tool that can be used to diversify the region's water supply. Alone, the Carlsbad Desalination Plant, and desalination in general, will never be enough. The region needs to continue to push forward on other local sources such as recycled water. But most importantly, the region needs to take advantage of the most cost-effective method of increasing water reliability- which is conservation.

Regardless of the amount of conservation and recycling that is achieved, the region will be importing a significant amount of water which desalination could offset. Initially, a premium will be paid for the increased reliability of desalinated water as its price will exceed that of imported water. This premium is projected to shrink as the factors that impact the price for desalinated water (energy prices and general inflation) increase at slower rates than the cost of imported water.

- In 2004, the San Diego County Taxpayers Association (SDCTA) expressed support for an agreement between Poseidon Resources and the City of Carlsbad to build a seawater desalination plant. This agreement was ultimately unsuccessful as costs grew and a subsidy necessary to make the project feasible dried up.
- The San Diego County Water Authority (CWA) has stepped in and proposed a Water Purchase Agreement to purchase a minimum of 48,000 acre-feet of water from the Poseidon Plant. At CWA's option, Poseidon is responsible for delivering an additional 8,000 acre-feet for a total of 56,000 acre-feet annually.
- There are four required major infrastructure investments that will be made to bring desalinated water into our drinking water supply: (1) The desalination plant itself, (2) Conveyance Pipeline, (3) A relining and rehabilitation of a CWA pipeline, and (4) Improvements at the Twin Oaks Valley Water Treatment Plant.
- If the minimum amount of 48,000 acre-feet is purchased, the per unit price is estimated at \$2,290. If the maximum amount of 56,000 acre-feet is purchased, the per unit price is estimated at \$2,041. These prices include all related upgrades to the Water Authority's pipelines and the Twin Oaks treatment plant.
- One significant downside to desalination, is its high usage of energy. Poseidon and the plant operator are guaranteeing a maximum amount of energy that can be used while the County Water Authority is accepting the risk of energy rates.
- As retail agencies enter into agreements to purchase Poseidon's water at full cost, the impact on rates at those agencies that do not have an agreement to purchase a higher portion of desalinated water through CWA will be lessened. CWA has estimated the impact on ratepayers at between \$5 and \$7 per month.
- The Draft Water Purchase Agreement is solely related to the purchase of product water; Poseidon is solely responsible for ultimately completing construction of the facility. The current timeline has construction starting in early 2013 and operations beginning in early 2016. The term of the contract will be for thirty (30) years, starting from the commercial operation date. The CWA has been clear in stating that because there is an inverse relationship between risk and cost, their intent was not to remove all risk from CWA, but rather to remove a great deal of the risk.

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Board Action: **SUPPORT (24-0-5)**

Rationale:

Seawater desalination is one tool that can be used to diversify the region's water supply. Alone, the Carlsbad Desalination Plant, and desalination in general, will never be enough. The region needs to continue to push forward on other local sources such as recycled water. But most importantly, the region needs to take advantage of the most cost-effective method of increasing water reliability- which is conservation.

Current dry year projections have demand significantly exceeding preferential right allocations from the Metropolitan Water District. Regardless of the amount of conservation and recycling that is achieved, the region will be importing a significant amount of water which desalination could offset. Initially, a premium will be paid for the increased reliability of desalinated water as its price will exceed that of imported water. This premium is projected to shrink as the factors that impact the price for desalinated water (energy prices and general inflation) increase at slower rates than the cost of imported water.

Background and Project Overview:

In 1998 Poseidon Resources proposed the construction of a desalination plant in Carlsbad, CA that would produce 50 million gallons per day (mgd) of potable (drinkable) water. The project takes sea water that is used to cool the Encina Power Station and filters it, adds purifying chemicals, and finally, sends it through a reverse osmosis treatment. The impurities that have been cleaned from the water are then distributed back into the ocean.¹

In a 2004 letter to the Mayor of Carlsbad, the San Diego County Taxpayers Association (SDCTA) expressed our support for the agreement writing:

"San Diego must diversify its supply portfolio if our region is to remain competitive and improve the quality of life for all of our residents. Public/Private partnerships, such as the one that your City has developed with Poseidon, go a long way toward meeting that goal."

This agreement was ultimately unsuccessful as the price grew and a subsidy became necessary to make the project feasible, and the potential subsidy from the Metropolitan Water District dried up. In recent months, Poseidon released the Draft Water Purchase agreement with the County Water Authority for the same project.

¹ The Carlsbad Desalination Project, Brought to You by Poseidon Resources. Desalination 101: How the Carlsbad Desalination Project Works. Accessed 9/9/2010. Available: http://www.carlsbad-desal.com/desal_101_how_it_works.asp.

Water delivery pipelines would also be constructed to take the water from the plant to the San Diego County Water Authority's (CWA) Second Aqueduct in San Marcos, CA. See Figure 1 for a map of the pipeline route. When completed, it will be able to produce up to 56,000 acre-feet per year (7% of projected regional supply).

There are four required major infrastructure investments that will be made to bring desalinated water into our drinking water supply:

- The desalination plant itself
- Conveyance Pipeline
- A relining and rehabilitation of CWA's Pipeline 3
- Improvements at the Twin Oaks Valley Water Treatment Plant

Figure 1: Map of Desalination Related Infrastructure Investments



Source: CWA²

² http://www.sdewa.org/sites/default/files/files/board/2012_presentations/presentations_2012_08_09.pdf

Permitting

The first step in getting the desalination plant project approved was completing an Environmental Impact Report (EIR). The EIR commenced in 2004 and was approved by the City of Carlsbad in 2006.³ Poseidon Resources has achieved permits from all necessary public agencies, including:⁴

- City of Carlsbad - Conditional Land Use (June 2006)
- Carlsbad Redevelopment Agency - Redevelopment Permit (June 2006)
- Regional Water Quality Control Board - National Pollutant Discharge Elimination System Permit (August 2006)
- California Coastal Commission - Coastal Development Permit (November 2007)
- State Lands Commission - Lease Approval (August 2008)

Costs

In Figure 2, costs are represented on a per acre-foot basis to allow for comparison with alternative sources.

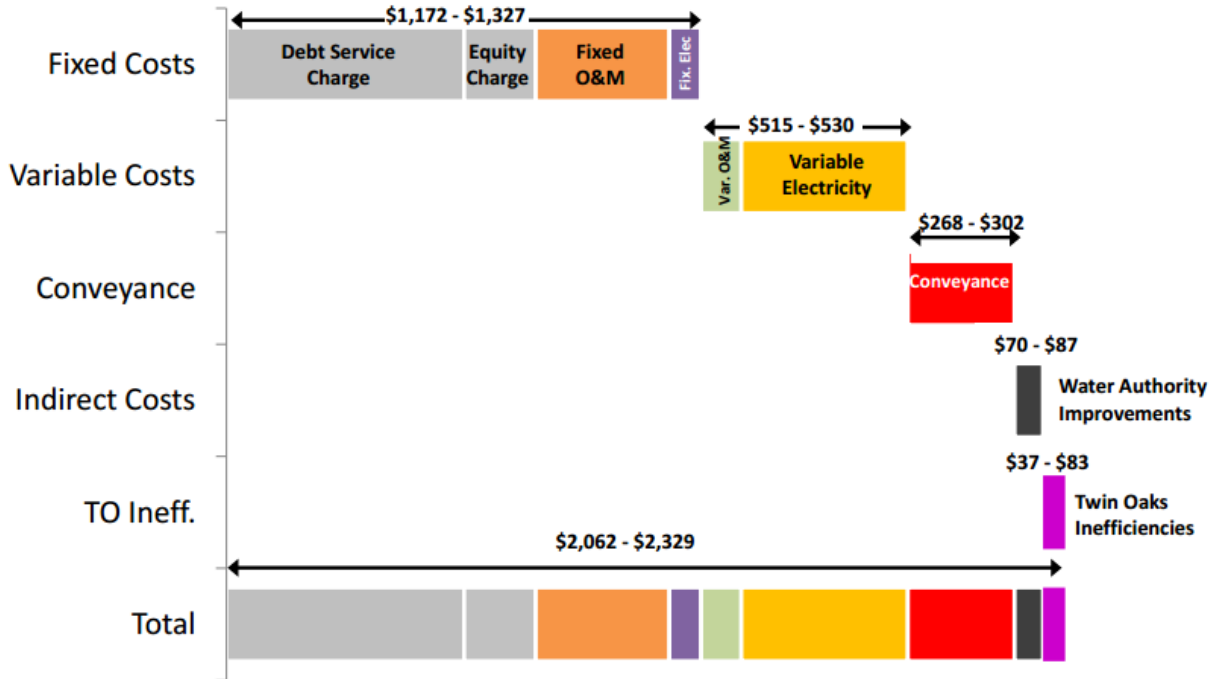
On top of the capital charge on Poseidon's assets (both the debt service and equity components) other direct costs include operations and maintenance, electricity, and the conveyance costs for the pipeline owned by CWA.

In addition, CWA allocates costs for necessary improvements to the Twin Oaks Valley Water Treatment Plant to accommodate the project, as some efficiencies are lost at the same plant as a result of accepting desalinated water. These costs are not included in the Water Purchase Agreement; however, they are real impacts of the project and are thus included for comparison with other less reliable sources such as importing water. Currently, the cost per acre-foot of treated water from MWD is approximately \$800/acre-foot (AF).

³ Resolution No. 6087 of the Planning Commission of the City of Carlsbad, CA. Accessed 9/9/2010. Available: <http://www.carlsbad-desal.com/media/EIR-Reso-Findings-SOC-and-MMRP.pdf>.

⁴The Carlsbad Desalination Project, Brought to You by Poseidon Resources. Accessed 9/9/2010. Available: <http://www.carlsbad-desal.com/>.

Figure 2: Price per Acre-Foot with Conveyance and Water Authority Improvements



Source: CWA⁵

Note: The costs presented in this graphic are modestly higher than is now projected. An updated graphic is not available.

The facility would produce an annual minimum of 48,000 acre-feet, which would be a guaranteed purchase by CWA. This quantity was determined based on the minimum amount CWA would demand in repeated wet years. The fixed costs are spread over these guaranteed purchases. At CWA's option, Poseidon is responsible for delivering an additional 8,000 acre-feet for a total of 56,000 acre-feet annually.⁶

If the minimum amount of 48,000 acre-feet is purchased, the per unit price is estimated at \$2,290. If the maximum amount of 56,000 acre-feet is purchased, the per unit price is estimated at \$2,041. These prices include all related upgrades to the Water Authority's pipelines and the Twin Oaks treatment plant.

⁵ http://www.sdcwa.org/sites/default/files/files/board/2012_presentations/presentations_2012_08_23.pdf

⁶ <http://www.sdcwa.org/water-authority-board-continues-due-diligence-proposed-desalination-contract>.

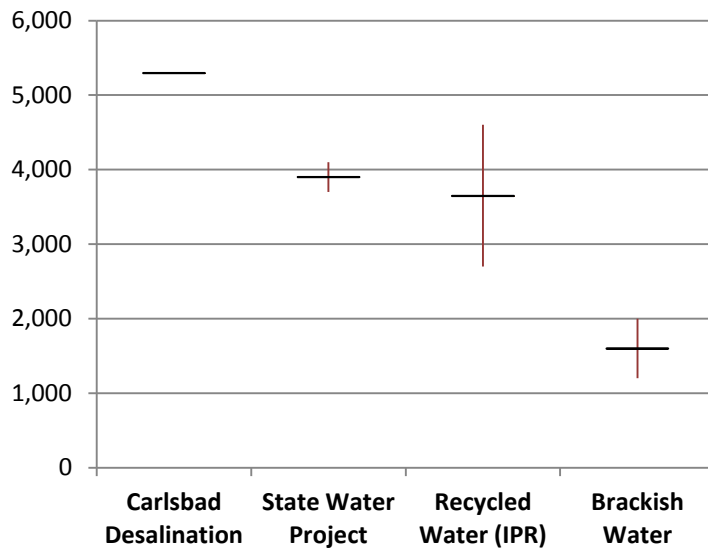
Energy Use

One significant downside to desalination, is its high usage of energy. Desalination is the only local option that uses more energy than importing water. The price of importing water is expected to increase at a faster pace than the price of energy over the decades to come.

The use of reverse osmosis treatment technology is both the most effective and the most energy intensive according to the CWA. While reverse osmosis technology is used for recycling water as well as desalination, the energy usage differs for the two uses given the concentration of “target constituents” being removed from the water.

The following figure presents the regional ranges of energy use from different sources of water.

Figure 3: Energy Use Comparison of Water Sources (kWh/AF)



Source: SDCTA, CWA⁷

Note: Brackish water is water with a level of salt higher than fresh water, but lower than seawater.

Energy use is an important issue to consider efforts to use energy efficiently. Energy, along with water, is an important resource that our region needs to ensure a reliable and affordable supply for households as well as businesses.

The CWA expects that approximately one fourth of the cost of desalination will come from energy costs, making increasing energy rates a significant concern.

To provide some relief from this concern, the agreement is being drafted to include risk sharing. Poseidon and the plant operator Israel Desalination Engineers are jointly guaranteeing a maximum amount of energy that can be used. If rates exceed predictions however, the County Water Authority will pay the difference. CWA also maintains the ability to arrange power to be delivered or require that energy be purchased through a power purchase agreement.

⁷ County Water Authority. “Energy Use and Pricing in the Carlsbad Desalination Project”. July 18, 2012.

Impact on Local Water Agencies:

During the permitting process, Poseidon Resources executed Water Purchase Agreements with nine water agencies. Because the Water Purchase Agreements between Poseidon and the original nine water agencies included the provision that the Agencies would not pay any more for the project water than the per-unit cost of imported water supplies, the subsidy from the Metropolitan Water District was necessary to guarantee profitability of the project for Poseidon Resources. Once CWA's lawsuit against Metropolitan put this subsidy into jeopardy, Poseidon sought an alternative comprehensive Water Purchase Agreement with the CWA.

The CWA is working to commit up to 49 percent of the new water source to retail agencies. As retail agencies enter into agreements, this would lessen the impact on rates at those agencies that do not have an agreement to purchase a higher portion of desalinated water through CWA. Those that do make such an agreement will receive increased reliability through preferential rights.

An issue that has yet to be resolved is a potential change to the CWA rate structure after adding desalination as a significant local source of water. One option is to integrate the cost of the desalination plant into the existing rate structure. The other is creating a new Infrastructure Access Charge (IAC) that would be fixed per meter representing the increased regional water supply reliability. In order to do this effectively, a calculation must be made valuing increased reliability.

There is also the issue of the benefit received by untreated water customers versus treated water customers as the drinking water compliance aspects of desalination only benefit retail agencies that purchase treated water. A method for calculating the benefits for each class of customer has been proposed by CWWA staff involving separating the cost into a supply benefit and a treatment benefit.

Most recently, CWA has estimated the impact on ratepayers at between \$5 and \$7 per month.⁸ The impact on each customer will differ based on if their retail agency decides to purchase water more directly from Poseidon, the degree to which their retail agency purchases treated and/or untreated water, the CWA's final allocation decisions, and rate allocation decisions of their retail agencies. The \$5 to \$7 estimate is a calculation performed by CWA estimating the impact of a composite residential customer purchasing the average quantity of 15 Hundred Cubic Feet (HCF) per month and includes an estimated increased IAC. CWA has said that "several agencies have expressed an interest" in purchasing water more directly from Poseidon. The City of Carlsbad has publicly communicated their interest.

⁸ October 23, 2012 Letter to SDCTA from CWA.

Timeline

Negotiations to develop the Contract only commenced once Poseidon Resources had identified, and delivered to CWA, a definitive equity commitment.⁹ While this commitment was being sought, the CWA prepared a draft of the contract and provided it to Poseidon. Once (1) the equity commitment was delivered to the CWA, (2) Poseidon and all of the agencies that have previously executed agreements with Poseidon on this project assured CWA that these agreements wouldn't be a cause for liability for the CWA, and (3) the CWA Board approved commencement of negotiations, negotiations began. Since, CWA has conducted a due diligence examination of Poseidon and the project. However, this due diligence is in no way meant to be an endorsement of the project. In fact, the resulting Draft Water Purchase Agreement is solely related to the purchase of product water; Poseidon is solely responsible for ultimately completing construction of the facility. The current timeline has construction starting in early 2013 and operations beginning in early 2016.

Draft Water Purchase Agreement (Poseidon and the San Diego County Water Authority):

This section summarizes some of the most significant points within the Draft Water Purchase Agreement. Note that, with the exceptions of changes in the law that are not the result of acts or omissions of Poseidon and *Force Majeure*, all of the risk of constructing, financing, producing, and delivering product water is placed on Poseidon.

Term of Contract

The term of the contract will be for thirty (30) years, starting from the commercial operation date. However, the contract may be extended for up to three (3) additional years to recoup delivery time lost due to events outside of the parties control such as war, terrorism, or uninsurable natural disasters.

Water to be Purchased

CWA will take a minimum of 48,000 acre-feet of water per year, and will be charged on a per-acre-foot unit basis. This is often referred to as a "take-or-pay" agreement. The amount was determined to be the minimum amount that CWA would want to purchase (assuming wet weather reducing demand). The fixed costs associated with the plant are built into the price paid for these units on water. In the case that the quality of water delivered to CWA doesn't meet water quality requirements, the CWA will not have to pay for such water. Poseidon has the responsibility to produce up to 56,000 AF of water per year. These units of water are priced significantly lower as they are designed only to include variable costs.

The Draft Water Purchase agreement sets the average price for 2012 at \$1,876 per acre-foot (if the maximum is purchased) and \$2,097 per acre-foot (if the minimum is purchased). The additional costs for improvements to the Water Authority's infrastructure aqueduct system that are necessary to accept the desalinated water bring the total cost to between \$2,042 to \$2,290 per acre-foot, depending on how much water is purchased annually. These costs are indexed to the rate of inflation estimated to average 2.5 percent per year. If electricity rates increase at a higher than expected rate, this additional cost will also be paid by CWA. For context, imported treated water

⁹ An executed agreement setting forth detailed terms for equity investment in the project, including the investment amount, form of investment, ownership interest, timing of investment, target closing date, project governance, and conditions to funding.

rates from Metropolitan Water District increase on average 7.9 percent per year based on recent and estimates of coming years from between 2005 and 2014.¹⁰

The CWA has no obligation to purchase any water before the commercial operation date, except in the case that the State Department of Public Health approves introduction of product water into the CWA's distribution system before that date.

If Poseidon is able to achieve any grants, subsidies or contributions from a governmental agency, it will be for the full benefit of the CWA. Any debt taken out on the project is not permitted if the amortization term exceeds the term of the Contract.

CWA Oversight of Operations

At any time during construction, the CWA may inspect the project to ensure that it is consistent with the CWA's standards and requirements for similar facilities. However, CWA will not have design approval rights once the contract has been signed, with the exception of those consistency inspections.

Poseidon may not make any expansions or modifications to the plant without the express approval of the CWA, with the exception of improvements made to the plant beyond the twentieth year of the project. CWA must be the agency to propose these improvements, and will subsequently adjust compensation to Poseidon for the cost of implementation.

Plant and Delivery System Purchase Options

The CWA is provided the first opportunity to buy out the delivery system early in the case of default at the price of the remaining debt. Should the plant require any damage repairs that Poseidon is not able to finance, the CWA may purchase the plant for the amount equal to the outstanding indebtedness. In either case, CWA would not be responsible for compensating equity holders.

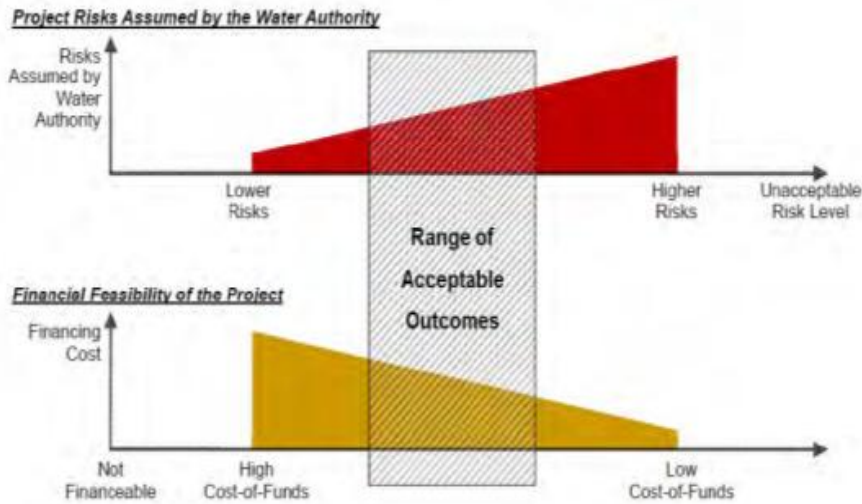
The CWA may have the option to purchase the plant at any time following the tenth anniversary of the commercial operation date. The CWA also has the right to purchase the plant for one dollar at the end of the term of the contract.

Risk and Liability

Much of the Draft Water Purchase Agreement is dedicated to allocating responsibility in the case of hypothetical negative events occurring. The CWA has been clear in stating that because there is an inverse relationship between risk and cost as seen in the following figure, their intent was not to remove all risk from CWA, but rather to remove a great deal of the risk.

¹⁰ County Water Authority. Seawater Desalination Fact Sheet.

Figure 4: Levels of Acceptable Risk



Source: CWA¹¹

The Draft Water Purchase Agreement allocates risk as presented in the following table.

Table 1: Allocation of Risk

Risk to Poseidon	Risk to County Water Authority
Poseidon maintains responsibility for risk of project completion, including permitting, financing, design, construction, and water quality testing.	CWA is liable for any cost increases due to changes in law, unless the start of operation date (January 1, 2015 or 40 months following the date of the financial close) isn't achieved or if the costs were due to any acts or omissions from Poseidon.
Poseidon will maintain full responsibility for plant and water delivery system operation, while those assets are owned by Poseidon.	If any event beyond the control of either Poseidon or the CWA damages the raw water intake, outfall, or any other of the Encina Power Plant's facilities, the CWA may be liable.
Poseidon will take on all insurance burdens and will compensate the CWA if they take out any insurance on behalf of Poseidon.	If seawater falls outside normal parameters, no damages would be paid by Poseidon for inability to sell water.
Cost of Encina Improvements due to expected power station closure, up to \$21 million capital costs and \$2.5 million in annual operating costs (Poseidon's estimates) are built into the agreement. If costs to do this exceed expectations, Poseidon will cover them.	In cases of natural disasters, war or terrorism (uninsurable only) causing a stop in service from Poseidon, time will be added to the end of the contract in which water will continue to be sold.
If energy is used inefficiently, the additional energy use will be paid for by Poseidon.	Risk associated with bond financing interest rates is born by CWA.
	Risk associated with general price inflation is born by CWA as rates charged by Poseidon are indexed to CPI.
	CWA would be impacted if electricity rates increase beyond projections.
	Operating the Twin Oaks Valley Water Treatment Plant to accommodate the new source, and any complication that may arise is the responsibility of CWA.

¹¹ CWA. "Overview of Key Terms for a Water Purchase Agreement with Poseidon". August 9, 2012.