

SAN DIEGO COUNTY WATER AUTHORITY
DESALINATION COST ALLOCATION
COST OF SERVICE RATE STUDY

May 13, 2014



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SAN DIEGO COUNTY WATER AUTHORITY

COST OF SERVICE RATE STUDY

1.0 EXECUTIVE SUMMARY

The San Diego County Water Authority (the Water Authority) engaged Carollo Engineers (Carollo) to independently review and provide an opinion regarding its rates and charges for water and services. The work was divided into two phases. Phase I entailed a comprehensive review of all Water Authority rates and charges, resulting in the May 2013 *Carollo Engineers Cost of Service Study Phase I Report* and the *Carollo Engineers Capacity Charge Report* (May 2013 Reports) that served as a foundation for the Water Authority's CY 2014 rates and charges and adjustment of the capacity charges. The May 2013 reports demonstrated that the Water Authority has a clear and defensible process to allocate system expenditures to rate categories, as well as fairly and reasonably recovers those expenditures from member agencies in accordance with cost of service requirements.

In 2012, the Water Authority approved the Carlsbad Desalination Project (Project), which is comprised of Desalination Plant (Plant), the Desalinated Product Water Conveyance Pipeline (Pipeline), and additional aqueduct system upgrade and repurposing work in connection with the Desalination Project (System Improvements). The Water Authority and Poseidon Resources LP (Poseidon) entered into a 30-year Water Purchase Agreement (WPA) for the production and delivery of up to 50 million gallons a day (56,000 acre-feet per year (AFY)) from the Plant. The Water Authority and Poseidon also entered into a design build agreement for the Pipeline (DBA). The Plant and Pipeline are the subject of a complex financing arrangement that included the issuance of two series of bonds, one for the Plant and the other for the Pipeline. The System Improvements are being constructed by the Water Authority as part of its Capital Improvement Program (CIP).

Phase II evaluated issues associated with recovery of costs related to expenditures for the Project through rates and charges in CY 2015. In conducting the Phase II evaluation, Carollo considered the May 2013 Reports, the WPA and DBA, the Project finance documents, and other information provided by Water Authority staff including Member Agency Cost of Service Phase II Workgroup (Workgroup) recommendations and documents, along with the Water Authority's existing cost of service allocation methodology, American Water Works Association (AWWA) cost of service standards, industry best practices, Board policies as described in Report Section 3.4, and California legal requirements as described in Report Section 3.5. Based on our independent professional judgment, Carollo has determined that:

- Allocation to the melded Supply rate for CY 2015 of Project costs associated with the Plant is reasonable and consistent with cost of service requirements and Water Authority rate structure policies.

- Allocation to the Treatment rate of a portion of the Plant costs as recommended by the Workgroup is reasonable and consistent with cost of service requirements and Water Authority rate structure policies.
- Allocation to the Transportation Rate and Infrastructure Access Charge of Project costs associated with the Pipeline is reasonable and consistent with cost of service requirements and existing Water Authority rate structure policies.
- Allocation to the Transportation Rate and Infrastructure Access Charge of the System Improvements in accordance with existing Water Authority rate structure policies is reasonable and consistent with cost of service requirements.

The Water Authority rates are comprised of five functional rate categories – Customer Service; Transportation; Treatment; Storage; and Supply. The Project has an impact on multiple functional rate categories. The Water Authority established a Cost of Service Workgroup, consisting of representatives of the Water Authority's member agencies, Water Authority staff, and A&N Technical Services to evaluate cost allocation considerations for the Desalination Project. The primary focus of the Workgroup effort was the allocation of Project costs between commodity related rate service categories. On March 27, 2014, the Board considered recommendations from its Fiscal Sustainability Task Force (FSTF) regarding application of certain fixed revenue policies to Project costs and provided direction regarding allocation of certain Project costs to CY 2015 rates and charges, including defining how to recover CY 2015 Desalination Plant expenditures. With consideration with the FSTF and Workgroup efforts, the Board direction included:

1. Recover Plant costs through volumetric rates for CY 2015 and refer the issue of allocation between fixed and variable rates and charges of Plant debt and equity costs to the Administration & Finance Committee for a report and recommendation in connection with the setting of CY 2016 rates and charges and
2. Recover Pipeline costs through application of current policies, including allocation between fixed and variable revenues;
3. Refer all other FSTF recommendations to the Administration & Finance Committee.

This Phase II report evaluates the recommended allocation of Project costs and separates the discussion into two parts – Plant costs are discussed first. Pipeline and Supplemental Improvement costs are discussed next. Because the Plant is a water production facility, allocation of costs to the melded Supply rate is appropriate. However, as discussed in this report, a small portion of the Plant cost should be allocated to the Treatment rate to account for the fact that the water produced by desalination meets all drinking water standards. This is a common consideration when preparing cost allocations when two or more benefits emerge from a single, non-separable production process, as is the case with the Plant. The melded CY 2015 Supply rate would be \$764. The Pipeline and System Improvement costs were evaluated for allocation to the Transportation rate and Infrastructure Access Charge in

compliance with existing Board policy. For CY 2015, the Transportation rate would increase to \$101 per acre-foot.

Based on findings in this report, the analysis performed by Carollo affirms that the Water Authority's proposed cost recovery for the Desalination Project as reasonable and in compliance with cost of service requirements and industry best practices. There may be further refinements to allocate Project costs, including additional or indirect benefits of the Project. Among those refinements for further consideration is apportionment of Plant debt and equity costs to fixed charges. Carollo is informed that these further refinements have been referred to the Administrative and Finance Committee for evaluation and recommendation in connection with setting of rates and charges for CY 2016.

2.0 BACKGROUND

In 2013, the Water Authority reinitiated the FSTF in order to ensure the long-term fiscal sustainability of the Water Authority. FSTF was focused on the rate and charge structure, fiscal and reserve policies, and financial metrics. Additionally the Water Authority established the Workgroup, consisting of member agencies, Water Authority staff, and consultants, to evaluate cost allocation considerations for the desalination project.

The Desalination project has a bearing on multiple functional rate categories. The benefits of the project must be defined, quantified, allocated, and collected in a manner that is consistent with Board policy and the cost of service requirements discussed in section 3 of this report. The Workgroup identified and discussed the following key topics regarding the allocation the Desalination costs:

- Identify the value of creating an additional water supply source that should be recovered through the Supply rates.
- Identify the value of the incidental treated water benefit resulting from production of water by the Desalination Plant and possible allocation of costs to Treatment rates.
- Allocation of desalination conveyance pipeline costs to Transportation and/or Supply rates.
- Rate and charge structure that is consistent with Board policy

In March 2014, the Board provided direction based on the Task Force report regarding allocation of fixed revenue policies to Project costs for the CY 2015 rates and charges. This Board direction provided guidance to staff on how to incorporate the Workgroup's allocation of Project costs to functional rate categories for use in the 2015 rates and charges. This report provides an independent evaluation of the results of the Board's directions and Workgroup conclusions.

2.1 Carlsbad Desalination Project

The Project is an integral component of the Water Authority's long-term water supply strategy to improve the San Diego region's water supply reliability. The Plant is a supply production project, which will provide a new local source of potable water to supplement imported water supplies. Desalination uses reverse osmosis technology to separate fresh water molecules from seawater. Water from the ocean is forced through tightly wrapped membranes under very high pressure. The membranes allow the smaller water molecules to pass through, leaving salt and other impurities to be discharged from the facility. The Plant will produce and deliver up to 50 million gallons a day (56,000 acre-feet per year (AFY)) of desalinated water that incidentally meets all drinking water standards, and will provide approximately 7% of the water needs for the region. The Project will provide the Water Authority with a locally controlled, drought-proof supply of high-quality water that meets or exceeds all state and federal drinking water standards. In approving the Project, the Board acknowledged that water production through desalination is not weather dependant; this new, drought-proof supply will reduce the region's dependence on water from the Colorado River and the Bay-Delta that are increasingly vulnerable to droughts, natural disasters, and regulatory restrictions.

The supply is secured through a 30-year WPA between the Water Authority and Poseidon for the entire output of the Plant. Under the WPA, Poseidon is responsible for Plant construction and all Plant operations and management. The WPA commits the Authority to purchase a minimum 48,000 AFY (Minimum Commitment) of produced water and provides the option to demand a maximum 56,000 AFY. Vallecitos Water District and Carlsbad Municipal Water District (Project Participants) intend to contract with the Water Authority to purchase 6,000 AFY of the minimum production. The debt service and fixed O&M and other fixed costs for the Plant and Pipeline are allocated under the WPA to the Minimum Commitment. The Project Participants will share these cost with the Water Authority on a proportional full cost recovery basis. Plant production above 48,000 AFY will be split on a pro rata basis between the Water Authority and the Project Participants at a discounted cost. For CY 2015, the Water Authority is expected to take delivery of 16,295 AF.

In addition to the Plant, the Project consists of the ten-mile Pipeline to deliver the water into the Water Authority's distribution system. The Pipeline will travel eastward from the plant through Carlsbad, Vista, and San Marcos and connect to the Water Authority's existing distribution network in San Marcos. The Pipeline is being constructed concurrently with the Plant by Poseidon pursuant to the DBA. The Pipeline is owned and will be operated by the Water Authority. Further, the Project includes the System Improvements being constructed by the Water Authority. These include improvements to existing regional water delivery and treatment system facilities, and the construction of new facilities, to integrate desalinated water into the Water Authority's system.

2.1.1 WPA Unit Costs

Two bond series were issued as part of the 2012 Project Bonds to pay a portion of the costs of constructing the Plant and the Pipeline. The Project Bonds were issued under separate trust indentures. Poseidon is responsible for the \$535,345,000 Series 2012 Plant Bonds. The Water Authority, through the Water Authority Financing Agency, is responsible for the \$203,215,000 issuance Series 2012 Pipeline Bonds. As the sole purchaser of water from the Plant under the WPA, the Water Authority is required to purchase all product water produced that meets minimum quantity and quality standard specified in the WPA. If it fails to purchase, the Water Authority remains obligated to pay the contracted amount specified in the WPA and to make debt service payments for the Pipeline Bonds. Conversely, if Poseidon fails to produce water that meets the minimum quantity and quality standards, it is required to pay the debt service on the Pipeline Bonds through “contracted shortfall payments” as specified in the WPA and project financing documents.

Under the WPA, the unit price for water includes debt service, equity return, power, and other operations and maintenance costs. These costs are allocated in detail in Appendix 10 of the WPA and include the Fixed Unit Price, the Variable Unit Price, and the Excess Product Water Deliveries Incentive Unit Price. For cost projections, the Minimum Commitment is assumed for deliveries.

Table 2.1 details the scheduled fixed unit charge, which is the sum of (1) the Debt Service Charge, (2) the Equity Return Charge, (3) the Fixed Operating Charge, and (4) the Fixed Electricity Charge. Fixed unit charges are not leveled on deliveries over the Minimum Annual Commitment.

Fiscal Year	Debt Service	Equity Return	Fixed Operating	Fixed Electricity	Total Fixed
2015/16	\$552.44	\$342.86	\$435.80	\$77.48	\$1,408.59
2016/17	552.44	370.54	442.42	78.43	1,443.83
2017/18	552.44	398.90	453.48	79.99	1,484.83
2018/19	552.44	427.98	464.82	81.59	1,526.84
2019/20	586.92	410.07	476.44	83.23	1,556.66
2020/21	601.55	420.40	488.35	84.89	1,595.20

Table 2.2 outlines the components of the variable unit charge, which is the sum of (1) the Variable Operating Charge, (2) the Variable Electricity Charge, and (3) the Poseidon Management Fee. The variable unit charge is leveled on all water deliveries.

Fiscal Year	Variable Operating	Variable Electricity	Poseidon Management	Total Variable
2015/16	\$112.80	\$468.42	\$10.75	\$591.97
2016/17	114.52	474.13	10.91	599.55
2017/18	117.38	483.61	11.18	612.17
2018/19	120.31	493.28	11.46	625.06
2019/20	123.32	503.15	11.75	638.22
2020/21	126.41	513.21	12.04	651.66

Appendix 10 also identifies the unit amount of “Contracted Shortfall Payments.” These identified unit amounts provide a sound and convenient basis for allocation of Pipeline Bond costs to the Water Authority’s volumetric Transportation rate. The Contracted Shortfall payments only apply to the Minimum Commitment. The Contracted Shortfall Payments are not leveled on deliveries over the Minimum Commitment. Based on estimated production of 16,295 AF in CY 2015, the Transportation related unit costs of \$209.64 per acre-foot are based on Contracted Shortfall Payments. Table 2.3 shows the Contracted Shortfall Payments for the next six fiscal years.

Table 2.3 presents the Contracted Shortfall Payment unit costs.

Fiscal Year	Contracted Shortfall Payment
2015/16	\$209.64
2016/17	209.68
2017/18	209.71
2018/19	222.98
2019/20	228.98
2020/21	234.13

3.0 COST OF SERVICE REVIEW

The purpose of this Phase II cost of service analysis is to provide a quantifiable basis for distributing the full costs of the Project facilities, operations, and capital investments to appropriate rate structure components and rate categories. The Water Authority currently maintains a mix of fixed and variable revenues components and has five functional rate categories that correspond to the services it provides. These components and categories

are intended to mirror the nature in which expenditures are incurred in accordance with industry practice and cost of service requirements.

3.1 Carollo Independent Review Process

In performing its independent analysis, Carollo reviewed information and data sufficient to allow it to make the independent professional judgments stated in this report, including: Fiscal Sustainability Task Force documents and presentations; Member Agency Cost of Service Phase II Workgroup presentations and support files; Water Authority financial data; Water Authority Board memoranda, presentations, and directions regarding the Project and Project cost allocations; the WPA; the DBA; the Limited Offering Memorandum for the Plant and Pipeline Bonds; and engineering and cost data for the System Improvements. In addition, Carollo reviewed its May 2013 Reports. Carollo has relied upon budget and debt projections provided by the Water Authority staff provided Carollo all requested information Carollo deemed necessary for the conduct of its independent review. Additionally, Carollo worked with Water Authority Finance staff to review potential impacts of the cost of service methodology and process. This analysis reviews the conclusions of work and policy determinations made by others, including other rate consulting firms and Water Authority staff and policy makers.

3.2 Existing Rates and Charges

To determine the appropriate means for cost allocation and recovery, it is necessary to evaluate the Water Authority existing rates and charges. The Water Authority volumetric rates are comprised of commodity rates that are collected monthly per unit of metered water delivered to each agency (e.g., the Supply, Transportation, and Treatment rates) and fixed commodity rates that are apportioned among the member agencies according to their respective three-year rolling average of water purchases from the Water Authority (e.g., the Customer Service and Storage Charges).

In addition to the volumetrically measured rates, the Water Authority has an Infrastructure Access Charge (IAC) designed to generate, in combination with ad valorem property tax and water availability standby charge revenue, a minimum 25 percent ratio of fixed revenues to fixed expenditures. The IAC is an annual service charge imposed on member agencies and apportioned based on their respective total connected meter capacity, a measure of an agency's maximum potential to take water from the Water Authority.

As we evaluate how to best allocate the Project costs, it is necessary to review the existing rate and charge (cost of service) component definitions. A description of each water rate and charge category is as follows:

- Customer Service:

The Customer Service charge is a commodity based charge set to recover costs that are necessary to support the functioning of the Water Authority, to develop policies and to implement system-wide programs.

- Storage:
The Storage charge is a commodity based charge set to recover costs associated with the Emergency Storage Program (ESP) and Carryover Storage Program (CSP). The ESP and CSP include a system of reservoirs, interconnected pipelines, and pumping stations. The programs are designed to maintain water availability to the San Diego region in the event of an interruption in imported water deliveries and in the case of the CSP to provide operational flexibility and drought protection.
- Supply:
The Supply rate recovers the cost of water supply incurred by the Water Authority, including the full cost of purchase of water from the Metropolitan Water District of Southern California (MWD) at the delivery point, payments to the Imperial Irrigation District for transfer of conserved water, costs associated with obtaining conserved water from the Coachella Canal and the All-American Canal lining projects, costs of MWD wheeling for non-MWD water supplies (e.g. QSA supply exchange costs), certain desalination costs and other costs associated with acquisition of supplies and implementation of the Quantification Settlement Agreement (QSA).
- Transportation:
The Transportation rate is set to recover capital, operating, and maintenance costs of the Water Authority's water delivery facilities, including all facilities used to transport the water to member agency meters.
- Treatment:
The Treatment rate is designed to recover the Water Authority's cost of treating water. The Melded Treatment Rate includes the costs of purchasing treated water from MWD, the operating and capital costs associated with the Water Authority's agreement with Helix Water District's Levy Water Treatment Plant, operating costs associated with the Olivenhain Treatment Plant, the operating and capital costs associated with the Twin Oaks Valley Water Treatment Plant, and desalinated water costs allocated to this rate.

3.3 Background on Existing Rates and Charges

The Water Authority sets water rates and charges, when combined with other revenues that are sufficient to pay operating expenses, provide for maintenance and repair of facilities, provide for payment of principle and interest on debt, and provide reasonable reserves consistent with bond covenants and sound fiscal management. As required by law, the Water Authority sets rates and collects other revenues to meet all reasonably anticipated costs of its operations.

On June 27, 2002, the Water Authority adopted Ordinance No. 2002-03 establishing the current revenue structure, which consists of: ad valorem property taxes, including payments of member agencies in lieu of taxes; a Water Standby Availability Charge levied pursuant to § 5.2 of the County Water Authority Act; an Infrastructure Access Charge imposed on member agencies as a condition of maintaining connections to Water Authority facilities; a

capacity charge levied pursuant to § 5.9 of the County Water Authority Act; and rates and charges for delivery and supply of water, use of facilities, and provision of other services. With the development of the Twin Oaks Valley Water Treatment Plant, Treatment was later added as the final functional rate category in 2006. This revenue structure is reflected in § 5.00.050 of the Water Authority Administrative Code.

3.4 Key Governing Board Policies

In setting its rates and charges, the Water Authority must meet cost of service requirements, in which rates and charges may not exceed the reasonable cost of providing the services, as well as clearly demonstrating the nexus between the costs allocated and services provided to customers. In doing so, the Water Authority must also consider sound budgeting practices and fiscal and resource management objectives, such as: assuring a reasonable mix of fixed and variable revenues, maintaining low cost access to financing, avoiding rate spikes, and managing resource use through appropriate pricing of water and resources. Carollo's May 2013 Reports addressed the appropriateness of the Water Authority's rate structure and rates and charges in connection with the Water Authority's CY 2014 rate setting process.

As the Water Authority incorporates Project costs into its rates and charges, the rates must also adhere with adopted Board policies, which implement the policy objectives noted in the previous paragraph along with cost of service requirements. These policies serve as the basis for the determination of the total revenue requirement as well as the proportion of the revenue requirement to be recovered by fixed charges and variable commodity rates. Several key Board Policies are highlighted below and can be found in the appendix of this report.

3.4.1 Infrastructure Access Charge

In 1998, Resolution No. 98-26, the Board established the Infrastructure Access Charge (IAC). The intent of the IAC is to provide the Water Authority with a more appropriate balance of fixed and commodity revenues. Prior to the implementation of the IAC, the Water Authority's revenues had a greater dependency on variable revenues that fluctuated with demand and did not adequately align with the existing cost structure. As such, the IAC was designed to be independent of commodity sales and the new business development cycle and generate a minimum 25 percent ratio of fixed revenues to fixed expenditures. The IAC is a fixed monthly charge and is based on meter size. Resolution No. 98-26 is included as Appendix A.

3.4.2 Existing Rate Structure

As discussed in the May 2013 Reports, the Water Authority's existing rate structure includes fixed and variable components. The fixed water rate categories are comprised of the Storage and Customer Service charges. The variable water rate categories encompass the Transportation, Melded Treatment, and Melded Supply rates. These rates are in

addition to the IAC and Capacity Charge. In addition, the Water Authority collects property taxes and standby charges which operate along with the IAC to offset the revenue requirement.

3.4.3 Financial Management Amendment (2006)

In 2006, following the recommendations of the Rate Model Working Group (RMWG) and Administrative and Finance Committee, the Board amended the Water Authority's financial policies regarding the Rate Stabilization Fund (RSF) and Debt Service Coverage Ratio (DSCR). As part of the amendments, the Board established a target funding level for the RSF that better protects the Water Authority against the financial impact of 2.5 years of wet weather (3.5 years max). In addition, it established a target DSCR of 1.50x, which is above the minimum legal bond covenant of 1.20x.

The overall benefits of the amendments included reduced rate volatility, increased protection against wet weather, a transparent and flexible RSF framework, and increased cash funding of the CIP. The RSF also provides a mechanism for rate smoothing and source of emergency funding, as necessary. Furthermore, it strengthened key financial ratios—higher debt service coverage ratio, decreased debt ratio and increased cash days—to support the maintenance of the Water Authority's AA+ credit ratings and access to lower rates. The Board Action, implementing the Rate Model Work Group Financial Policy Proposal is included as Appendix C.

3.5 Overview of Cost of Service Requirements

The Water Authority's rates must adhere to California constitutional and statutory requirements. In general, California law requires agencies imposing water rates and charge to demonstrate a nexus between the cost of providing services and the service or benefits received. Beyond the cost-of-service requirements imposed by the constitution and general statutory law, the Water Authority must also adhere to the County Water Authority Act.

Section 7 (j) of the County Water Authority Act states that the "board of directors, so far as practicable, shall fix such rate or rates for water as will result in revenue which will pay the operating expenses of the authority, provide for repairs and maintenance, and provide for the payment of interest and principal of the bonded debt." The revenue requirement (e.g., "costs") described in this report is grounded on this statutory requirement, the Water Authority's General Resolution, and sound fiscal management. These costs are then apportioned to the member agencies through the allocation to the fixed charges and variable rates described in the adopted rate structure according to service function. The apportionment is accomplished in accordance with standards established by California law, including the provisions summarized below, which, while stated a bit differently, essentially describe the same cost of service standard.

Proposition 26 – This proposition was adopted by the voters in November 2010. Among other things, it amended California Constitution article XIII C, section 1 to add a definition of

“tax.” As defined by Proposition 26, a tax means “any levy, charge, or exaction of any kind imposed by a local government” with certain enumerated exceptions. There are two applicable exceptions:

- The exception for a “charge imposed for a specific benefit conferred or a privilege granted directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the local government of conferring the benefit or granting the privilege,” and
- The exception for a “charge imposed for a specific government service or product provided directly to the payor that is not provided to those not charged, and which does not exceed the reasonable costs to the local government of providing the service or product.”

Proposition 26 establishes that: “The local government bears the burden of proving by a preponderance of the evidence that a levy, charge, or other exaction is not a tax, that the amount is no more than necessary to cover the reasonable costs of the governmental activity, and that the manner in which those costs are allocated to a payor bear a fair or reasonable relationship to the payor’s burdens on, or benefits received from, the governmental activity.”

Government Code Section § 50076 – This section of the Government Code was adopted in 1979, following the adoption of Proposition 13 in 1978. It provides that special taxes “shall not include any fee which does not exceed the reasonable cost of providing the service or regulatory activity for which the fee is charged.”

Government Code Section § 54999.7 – This is another section that grounds public agency rate setting on cost of service principles and states that fees “for public utility service, other than electricity or gas, shall not exceed the reasonable cost of providing the utility service.” It also provides that the fees will be “established in consideration of service characteristics, demand patterns, and other relevant factors.”

County Water Authority Act Section 5 (13) – This provision of the County Water Authority Act provides that in setting rates, “the board may establish reasonable classifications among different classes and conditions of service, but rates shall be the same for similar classes and conditions of service.” The Water Authority’s General Counsel has advised Carollo that this provision requires that rates be non-discriminatory and that differences in rates or rate apportionment be based on service differences, such as with the non-allocation of storage charge to agricultural customers. The General Counsel has also advised that this section may be construed consistently with the Constitutional and statutory cost of service requirements described above.

Cost of service principles are also established through industry standards. The AWWA established a general set of principles used to guide the development of water rates. These principles were developed and published in the *M1 Manual – Principles of Water Rates*,

Fees, and Charges. These guiding principles outline a consistent, universal approach and minimum standard that is employed by most agencies when setting rates and charges. The M1 Manual denotes that there is no prescribed single approach for establishing cost-based rates. Rather, agencies must exercise judgment to align rates and charges with local conditions and requirements, as well as applicable state law.

Together the industry standards and laws establish the cost of service requirements applied by Carollo in this report in forming its opinion that the Water Authority rates and charges are cost based and fairly, reasonably, and quantified and allocated to comply with the legal requirements outlined in Report Section 3.5

4.0 DISCUSSION

The Project was planned and designed to provide a secure additional water supply to the Water Authority. The Project is comprised of a water production facility, the Plant, and water conveyance facilities, the Pipeline and System Improvements. Based on this understanding and the Water Authority's existing cost of service methodology and cost center definitions Plant costs should be allocated primarily to Supply with a small portion allocated to Treatment. This is implemented through the CY 2015 melded Supply and Transportation rate adjustments. The Board deferred the issue of allocation of a portion of Plant debt and equity payments to fixed charges to later rate setting in CY 2016 following further review by the Administrative and Finance Committee. This choice to defer is reasonable and consistent with cost of service requirements.

4.1 Criteria for Findings and Recommendations

To confirm the appropriateness and general application of the cost of service requirements discussed above to the Board policies and direction regarding recovery of Project costs Carollo applied the following framework throughout the review:

- Does the desalination project cost allocation approach result in a fair, reasonable, and quantifiable connection between cost of service and benefit received?
- Is the allocation approach and methodology consistent with standards established in the AWWA M1 manual, meet does it Board policies, and does it adhere to applicable legal requirements?
- Have the policies and standards been applied consistently by the Water Authority? Is it likely that the allocation approach will be appropriate for use by the Water Authority in the future?

4.2 Challenges in Delineating Project Costs

The 56,000 AF of water produced by the plant through a single desalination process provides multiple benefits because the water supply is highly reliable and the product water meets state and federal drinking water standards by virtue of the production process.

In order to allocate costs, the Plant's costs must firstly be defined as either separable or non-separable. If the Plant's costs are deemed non-separable, then the costs will be allocated to and recovered through the primary benefit. Alternatively, should the costs be defined as separable, then a split-off point or points must be defined and its benefit quantified. A split-off point is the stage of a process at which the different individual benefits can be separately identified. This issue is discussed in section 4.3. The Pipeline presents a different set of cost allocation issues, primarily relating to application of existing rate structure policies. These are discussed in section 4.4.

The categorizations differ in their definition of separable and non-separable costs as well as delineated split-off points.

4.3 Desalination Plant

The Plant is a water production facility that will provide up to 56,000 AF of local supply to the Water Authority's water portfolio and is part of the Water Authority's plan to increase local water supplies and water reliability. Furthermore, environmental documentation and planning studies established the project purpose as new supply. Utilizing the unit costs presented in Report Section 2.1.1, the projected CY 2015 Plant cost required to be allocated to rates is estimated to total \$32.6 million based on an estimated delivery of 16,295 AF. That cost is divided between the Melded Supply and Melded Treatment rates.

4.3.1 Categorization as Supply

This categorization focuses on the primary purpose of the Plant, which is to provide a new, reliable water supply. However, there are also incidental benefits to other Functional Rate Categories, these incidental benefits result from and are dependent on the Project's water production. As the incidental benefits are dependent and cannot be separated, the costs of the Plant are therefore assumed non-separable.

As detailed in Report Section 3.2, the Supply rate recovers the cost of water supply incurred by the Water Authority, including the full cost of purchase of water from the MWD at the delivery point, payments to the Imperial Irrigation District for transfer of conserved water, costs associated with obtaining conserved water from the Coachella Canal and the All-American Canal lining projects, costs of wheeling for non-MWD water supplies through the MWD system, and other costs associated with acquisition of supplies and implementation of the Quantification Settlement Agreement (QSA). The Plant costs fit within the Supply function.

Given the nature of the desalination process and the created supply, there is no identifiable split-off point. As such, it is fair and reasonable to define the Desalination Plant costs as non-separable. As previously stated, cost allocation considerations arise as two or more benefits emerge from a single production process. As no split-off point can easily be defined and as the primary purpose and benefit of the Desalination project is supply, there are no direct or specific "Treatment" components to allocate.

Based on the forecasted costs and plant output, the Plant will produce an estimated 16,295 AF at a cost of \$32.6 million of which \$28.07 million is allocated to Supply (See Section 4.3.2). These costs are consistent with those detailed in Report Section 2.1.1 and Appendix 10 to the WPA. For CY 2015, the Total Supply costs are projected to total \$376.6 million. The Water Authority projected sales of 493,000 AF at a cost of \$340.4 million. By dividing the total supply cost by total water sales, an acre-foot cost of \$764 is calculated.

Table 4.1 details the water purchases and costs associated with the CY 2015 Merged Supply Rate.

Table 4.1 Proposed Calendar Year 2015 Merged Supply Rate	
Projected Acre-Foot Sales (A/F) (000's)	
MWD Tier I	296.5
IID	100.0
Canal Water Delivery Costs	80.2
<i>Carlsbad Desalination Plant Production</i>	<u>16.3</u>
Total A/F Sales	493.0
Water Purchase Costs (\$ Millions)	
MWD Tier 1 Water	\$172.56
IID Water Purchases & Wheeling	104.80
Canal Water Purchases & Wheeling	34.97
<i>Desalination Plant Supply Costs</i>	<u>28.07</u>
Subtotal Water Purchase Costs	\$340.40
Additional Costs (\$ Millions)	
Supply Revenue Requirement	\$27.30
IID Socioeconomic	3.10
QSA Environmental	5.30
Groundwater Storage	<u>0.50</u>
Subtotal Other Costs	36.20
Total Supply Cost	\$376.6
Proposed A/F Rate (Total Supply Cost /Total A/F Sales)	\$764

4.3.2 Allocation of Supply Costs as Treatment Benefit

Although the desalination process does not facilitate a split-off point to determine treatment costs, there are other methods to delineate or allocate indirect benefits. Under the Supply categorization, an issue known as the “free rider” dilemma arises. In this case, untreated customers would pay for the Plant production of water that meets drinking water standards without further water treatment and treatment customers would receive the treatment benefit at no cost. The segregation of the incidental treatment benefit from the supply benefit is done so that all water users pay for the benefit they receive.

One solution or approach in dealing with multiple benefits is to identify an agreeable split-off point, therefore delineating costs or functions within the Plant. This defined split off point would provide a basis for separating the Plant costs to all beneficiaries. However, as noted previously, the basic function and purpose of the Plant is to produce a water supply, and the desalination process for water production provides an incidental benefit because the produced water meets drinking water standards without further treatment.

Identifying a split-off point, it is very challenging when both supply and treatment are accomplished within a single production process. As no additional process is necessary or readily identifiable, the defined split-off point will be based on cost of service and accounting principles.

4.3.2.1 *Workgroup Recommendation - Benchmarking to Other Treatment Costs*

This is the approach settled upon by the Workgroup as the methodology used to calculate the treatment benefit of the Plant. The Water Authority currently has defined treatment costs as those associated with treatment costs from MWD, Helix, and the Water Authority’s own treatment operations. Under this approach the “benchmark” is set utilizing the existing Melded Treatment Charge (the average cost of treatment) to define a reasonable cost per acre-foot for the Treatment benefit provided by the Plant. As such, the Plant costs of treatment do not alter the average cost of treatment or the Melded Treatment rate. As treatment costs cannot be removed without removing the supply, this approach uses the existing rate as a proxy to provide an existing and clearly defined nexus between the cost incurred and the benefit provided. With the recommended Melded Treatment Rate of \$278/AF and a production level of 16,295 AF, treatment revenues will offset \$4.53 million of the Plant’s total cost of \$32.6 million.

Carollo finds that this approach is consistent with cost of service requirements. Benchmarking provides a clear, understandable, and strong nexus of benefit given the non-separable nature of the Plant’s costs. As there is no definable delineation between treatment and supply at the Desalination Plant, the avoided or incremental cost options rely too heavily on engineering and financial assumption. Benchmarking to other treatment costs provides a consistent, cost of service, and historically founded cost nexus to calculate a reasonable apportionment to treatment.

Two other methods were evaluated and rejected in favor of the Benchmark approach. These were the Incremental Cost and Avoided Cost approaches discussed next.

4.3.2.2 Other Methodologies Considered

The Incremental Cost approach would define the split-off point at an assumed point between the production of untreated and treated water. Supply would be allocated to the portion of the costs to produce untreated water and then Treatment would be allocated to the remaining incrementally. Engineering and financial based assumptions would be utilized to define a reasonable and appropriate line or point at which to delineate supply from treatment. If an acceptable point could be determined, this approach would provide a reasonable basis for defining the value or cost difference between untreated water and treated water. As stated previously and discussed within the Cost of Service Workgroup, given the desalination process, treatment costs cannot be removed without removing the supply, as such even with developed engineering assumptions a cost-benefit nexus is difficult to support for this Project.

Another approach considered was avoided costs. When the estimate of a split-off point cannot be made or is unduly burdensome to make, joint costs may be considered the difference between the multi-purpose cost and the sum of the specific costs for each purpose. As the Plant produces a multi-purpose benefit (Treated Supply), a final option is to base Treatment's potential benefit cost allocation of the Desalination Plant by calculating an avoided cost. Under this option, a unit cost is defined based on the "would be" capital and operating costs associated with development of separate supply and treatment facilities.

However, this approach does not appropriately acknowledge that the primary purpose of the Plant is to produce water supply and the Water Authority does not avoid any alternative treatment costs. The treatment benefit is incidental to the supply purpose, not the other way around. Additionally, the Water Authority already has the TOVWTP. As the Plant already exists, it could be argued that the Water Authority is not avoiding any costs associated with the "hypothetical" treatment facility. Simply, the implied untreated water supply could be treated at the existing TOVWTP.

5.0 DESALINATION PIPELINE

During its discussions, the Workgroup determined that it was reasonable to consider the Pipeline costs as a transportation expense. This section of the report details the rationale behind this determination and its accordance with cost of service requirements and existing Board policies.

5.1 Categorization to Transportation

As the Pipeline is funded through a separate bond series and serves a separate function from the Desalination Plant, there is a clear and appropriate separation of costs between

production and conveyance. This separation occurs at the point of delivery. The WPA defines the delivery point (Product Water Delivery Point) as the point at which the Pipeline (Product Water Pipeline) meets the Plant Site property line. This is consistent with the approach presented to the Cost of Service Workgroup on November 11, 2013 and it is our understanding that the member agency representatives concurred with this approach. Additionally, the identified separation of costs between the Plant and the Pipeline is reasonable as both the costs and functions differ.

Based on the existing Transportation rate definition (a rate to recover capital, operating, and maintenance costs of the Water Authority's water delivery facilities, including all facilities used to physically transport the water to member agency meters), the Pipeline can be reasonably viewed as an appropriate and reasonable cost to allocate to Transportation. The estimated CY 2015 Pipeline costs are \$3.4 million.

Table 5.1 outlines the Transportation rate that is charged to member agencies based on water deliveries.

Table 5.1 Proposed Calendar Year 2015 Transportation Rate	
Debt Service	\$35.6
<i>Desalination Pipeline Debt</i>	3.4
Operating Cost + Miscellaneous Cost Recovery	<u>17.4</u>
Gross Revenue Requirements	\$56.4
Less: Offsetting Revenues	
Capital Offsets	\$(9.2)
Operating Offsets ⁽³⁾	<u>(15.3)</u>
Revenue Requirement before Coverage	\$31.9
Coverage & Reserve Driven Needs	15.7
Total Revenue Requirement⁽¹⁾	\$47.6
Projected Acre Feet Sales⁽²⁾	472,003
Proposed AF Rate (Total Transportation Cost /Total AF Sales)	\$101
Notes:	
(1) Expenditures are presented in million dollars and may not foot due to rounding	
(2) Project AF sales is reduced by water taken directly from MWD	
(3) Assumes Pipeline debt included in IAC	

5.1.1 Pipeline Considerations

It may be necessary to review the possible bearing this allocation methodology may have on different users. Under separate agreements with the Water Authority, two Water

Authority member agencies (Vallecitos Water District and Carlsbad Municipal Water District) will purchase a combined total of 6,000 AF of the desalinated water as their own local supply. These agencies will be taking a direct connection off the Pipeline. A direct supply of desalinated water is considered by the Water Authority as a local resource for water shortage and drought response plans, and is thereby not subject to MWD or Water Authority imported water cutbacks. Carollo has been advised that the Board has previously adopted a standard form of agreement that assures full proportionate cost recovery for Plant and Pipeline costs from agencies having direct take agreements.

5.1.2 Infrastructure Access Charge

Once the cost of service categorization of project costs is complete, the Board must determine how to appropriately recover the necessary funds from its member agencies. The annual revenue requirements for each rate and charge category are recovered from the member agencies based on water demands and capacity requirements, which is defined based on each agency's total meter equivalents. Whereas the 2014 Cost of Service Report details each of the available rates and charges, for purposes of Desalination cost recovery, the discussion will focus on the recovery of the Plant debt and equity payments and Pipelines debt expense through the commodity charge (Melded Supply and Transportation Rates), as well as through the IAC.

The Board's direction for CY 2015 is to allocate the Plant's debt and equity payments to Supply and recover them solely through the Melded Supply Rate. Although the March 27th Board Action did not address the Pipeline debt, it is reasonable and in alignment with existing Board policy to recover the Pipeline cost through the Transportation Rate and IAC.

As the Pipeline debt is held by the Water Authority, this expense should be recovered through a combination of the Transportation commodity rate and the IAC. Consistent with existing Board policy, the IAC is comprised of 25 percent of the forecasted fiscal year 4-year average of Debt Service (long- and short-term debt) and 80 percent of forecasted 4-year average O&M costs, times 110 percent. Based on the forecasted four-year average fiscal year Pipeline debt expenses of \$6.2 million and following this methodology for CY 2015, the IAC would increase by \$1.7 million.

In addition, revenues collected through the IAC provide a commensurate revenue offset against the total revenues that must otherwise be collected annually from water rates and charges. This application methodology remains unchanged and is consistent with existing Board policy.

Table 5.2 shows the forecasted 4-year average debt expense.

Fiscal Year	Contracted Shortfall Payment	Fiscal Year Production (AF)	Total Cost	4-Year Average
2014/15	\$209.64		\$ -	\$6,173,726
2015/16	209.64	33,775	7,080,591	
2016/17	209.68	42,000	8,806,422	
2017/18	209.71	42,000	8,807,894	

Table 5.3 details the proposed IAC calculation methodology for CY 2015.

	4-Year Average⁽¹⁾
Long Term Debt Service	\$131.74
Misc LTD Fees	0.02
Total Short Term Debt Service and Costs	12.52
Pipeline Desalination Debt Service	6.17
Administration and Maintenance times 80%	38.19
Transportation O&M times 80%	0.00
Total Local Supply Development Costs times 80%	2.87
ESP Evaporation and System Losses times 80%	<u>3.33</u>
Total Fixed Costs	\$194.84
Total Fixed Costs Times 110% Times 25%	\$53.58
Less:	
Other Tax Receipts	(\$11.85)
Standby Availability Charge Rev	(11.31)
Remaining Fixed Cost Need (IAC Revenue)	\$30.42
Number of Meter Equivalents (ME) Used in Calculation	917,630
Proposed CY 2015 IAC Per Meter Equivalent (Monthly in dollars)	\$2.76
<u>Notes</u>	
(1) Presented in million dollars, calculations in tables may not foot due to rounding	

6.0 FINDINGS

Based on the independent review performed for this rate study, Carollo has found the Water Authority Board's CY 2015 recommendation for appropriating costs associated with the Carlsbad Desalination Plant is appropriate and consistent with AWWA cost of service principles, industry best practices, Board policies, and California legal requirements. Carollo's findings for this study are as follows:

- Allocation to the Melded Supply Rate for CY 2015 of Project costs associated with the Plant is reasonable and consistent with cost of service requirements and Water Authority rate structure policies.
- Allocation to the Melded Treatment Rate of a portion of the Plant costs as recommended by the Workgroup is reasonable and consistent with cost of service requirements and Water Authority rate structure policies.
- Allocation to the Transportation Rate and Infrastructure Access Charge of Project costs associated with the Pipeline is reasonable and consistent with cost of service requirements and existing Water Authority rate structure policies.
- Allocation to the Transportation Rate and Infrastructure Access Charge of the System Improvements in accordance with existing Water Authority rate structure policies is reasonable and consistent with cost of service requirements.