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**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Application of California-American Water
Company (U210W) for Approval of the
Monterey Peninsula Water Supply Project and
Authorization to Recover All Present and Future
Costs in Rates

A.12-04-019
(Filed April 23, 2012)

SUPPLEMENTAL TESTIMONY OF RICHARD C. SVINDLAND

Sarah E. Leeper
Nicholas Subias
California-American Water Company
555 Montgomery Street
Suite 816
San Francisco, CA 94111
(415) 863-2960
sarah.leeper@amwater.com

Attorneys for Applicant
California-American Water Company

December 15, 2015

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**BEFORE THE PUBLIC UTILITIES COMMISSION
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SUPPLEMENTAL TESTIMONY OF RICHARD C. SVINDLAND

I. WITNESS QUALIFICATIONS

Q1. Please provide your name, position and business address.

A1. My name is Richard C. Svindland. I am the Vice President of Operations for California American Water (CAW). My business address is 4701 Beloit Drive, Sacramento, CA 95838.

Q2. Have you provided testimony in this California Public Utilities Commission (Commission) proceeding and what are your qualifications?

A2. Yes, I have submitted direct, supplemental and rebuttal testimony as part of this proceeding. My qualifications, prior testimony experience and prior water and wastewater experiences are included with my original testimony.

II. PURPOSE OF TESTIMONY

Q3. What is the purpose of this supplemental testimony?

A3. The purpose of this supplemental testimony is to update the Monterey Peninsula Water Supply Project (MPWSP) cost as requested in the Administrative Law Judge’s Ruling Setting Evidentiary Issues and Schedule to Complete the Record for Phases 1 and 2, issued November 17, 2015.¹ This testimony provides current cost estimates for the

¹ Although cost information for the Groundwater Replenishment project is not included herein, we are currently working with the public agencies such that the information can be vetted by CAW and other parties.

1 desalination plant and related conveyance facilities and pipelines, as well as the aquifer
2 storage and recovery (ASR) facilities. Specifically, I will be updating cost estimates for
3 the following areas:

- 4 (i) Capital costs for the construction of the test slant well and the full
5 production slant intake wells needed for either a 6.4 million gallons per day
6 (MGD) or a 9.6 MGD desalination plant;
- 7 (ii) Capital costs for the construction of both a 6.4 MGD and a 9.6 MGD
8 desalination plant;
- 9 (iii) Capital costs for the construction of the conveyance facilities (includes the
10 CAW-Only Facilities, which also includes ASR facilities) needed for both
11 the 6.4 MGD and the 9.6 MGD facilities;
- 12 (iv) Capital costs for the construction of pipelines needed to: 1) return brine to
13 the Monterey Regional Pollution Control Agency's (MRWPCA) outfall,
14 and 2) to return water to the Salinas River Groundwater Basin (SRGB);
- 15 (v) Capital costs related to project implementation;
- 16 (vi) Capital costs related to contingencies;
- 17 (vii) Capital costs related to mitigations; and
- 18 (viii) Lastly, Operation and Maintenance costs for both the 6.4 MGD and 9.6
19 MGD facilities.
20

21
22 **III. UPDATED COSTS**

23 Q4. Which activities have occurred over the last several years that have allowed the project
24 costs to be updated?

25 A4. Since July 31, 2013, when CAW submitted two settlement agreements for the
26 Commission's consideration, CAW has continued to refine the accuracy of the capital
27 project costs. CAW has completed the procurement of the desalination plants (both 6.4
28 MGD and 9.6 MGD plants), completed the design, permitting and installation of the slant

1 test well, designed and procured the slant wells needed to deliver source water to the two
2 different size desal plants, and designed and procured the various conveyance facilities
3 and pipelines needed to deliver source, finished, brine and return water(s) to various
4 locations.

5
6 Q5. What is the significance of having procured portions of the project?

7 A5. By completing the procurement of the various project components it means that we have
8 received actual bids from contractors to perform the various components of work. This is
9 a more accurate cost representation than the engineering estimates used in previous
10 testimony and provides a greater level of certainty to the overall costs.

11
12 Q6. Please address whether this new information presents any changes to the capital project
13 costs identified in the large Settlement Agreement and subsequent November 2013
14 compliance filings.

15 A6. The overall capital cost for the 9.6 MGD plant essentially remains the same at \$338M.
16 The capital project cost for the smaller 6.4 MGD plant needs to increase from \$295M to
17 \$322M. Please see the summary table below and Attachment 1 which is a Technical
18 Memorandum (TM) that summarizes the updated project costs.

Item	Dec. 2015 Update (2015 Dollars) (Millions Rounded)		Nov. 2013 Update (2012 Dollars) (Millions Rounded)	
	6.4 MGD	9.6 MGD	6.4 MGD	9.6 MGD
	Base Construction Costs			
Intake Wells/Supply/Return Facilities	\$51	\$58	\$39	\$47
Desalination Plant	\$80	\$87	\$65	\$84
Northern Transfer Pipeline	\$14	\$14	\$11	\$11
CAW Convey., Term. Reser., & ASR Systems	\$71	\$71	\$53	\$53
Base Construction Subtotal	\$216	\$229²	\$168	\$195
Implementation Costs	\$52	\$52	\$43	\$43
ROW/Land/Outfall	\$15	\$15	\$8	\$9
Escalation Allowance	\$13	\$15	NA	NA
Contingency Allowance	\$26	\$28	\$42	\$57
Mitigation Cost Allowance	See TM	See TM	\$3	\$3
Brine & Potrero Rd	See TM	See TM	\$32	\$32
Total Capital Cost	\$322	\$338²	\$296	\$338²

Q7. Have all the MPWSP project components been procured?

A7. No. CAW has yet to procure the two ASR wells that are a part of the CAW-Only facilities and we have yet to procure the civil site package which includes piping, valve vaults and electrical facilities for the slant wells.

Q8. How are these non-procured portions being handled in the updated cost estimate?

A8. We are fortunate that CAW, jointly with the Monterey Peninsula Water Management District (MPWMD), recently completed the construction of ASR wells 3 & 4. Therefore, we have a good idea of the cost for the two new ASR wells needed for the MPWSP. Secondly, for the remaining civil package needed for the slant wells, we also have a lot of recent cost information based on the bids received for the test slant well civil package and the most recent bids received for the conveyance facilities.. While we do not have actual bid costs for these remaining non-procured items, we have updated our construction cost estimates based on this latest information. Additionally, in keeping with estimating

² The total does not equal the sum of the above line items due to rounding.

1 practices for the non-procured items, we are maintaining a higher level of contingency
2 (25%) until such time as we receive actual bids for these non-procured items.

3
4 Q9. Why is the total project cost for the 6.4 MGD plant cost increasing while the larger 9.6
5 MGD plant is not?

6 A9. Please refer to the attached TM for the cost comparisons by category, but at a high level,
7 the main reason is the fact that the difference in cost between the desalination plants (6.4
8 MGD vs. 9.6 MGD) was a lot lower than originally estimated. This smaller difference
9 coupled with the fact that the cost for the conveyance facilities came in higher than
10 originally estimated resulted in the smaller 6.4 MGD plant cost increasing above the
11 previous estimated amount while the larger 9.6 MGD project equaled the previous
12 amount. However, it is important to note that despite inflation, the cost estimates for the
13 larger project, which was last updated over two years ago, still remain valid.

14
15 Q10. Are the implementation costs increasing for the project?

16 A10. Yes. As originally filed in 2012, the implementation costs for the project were computed
17 as a percentage of the base construction costs and we believed that the computed amount
18 was sufficient to cover the originally scheduled implementation period. Now after several
19 years of delay, we have updated our costs based on the most recent schedule update to
20 reflect anticipated costs through the third quarter of 2017. Because CAW is under a Cease
21 and Desist Order with the State Water Resources Control Board (SWRCB) and because
22 we still endeavor to bring a project on line as soon as possible, we have continued to
23 advance the project entitlement(s), design(s), and various components in addition to
24 fending off several lawsuits from Marina Coast Water District and the Ag Land Trust.
25 These costs fall under the implementation cost category and we have increased this line
26 item based on costs spent to date and what we believe is needed to complete the project.

1 Q11. Are the contingency costs increasing for the project?

2 A11. No, they have been reduced to recognize that we have actual bids in hand for a vast
3 majority of the project. As indicated above we are carrying 25% contingency for any
4 remaining non-procured items and we have reduced the contingency to 10% for the
5 procured items.

6
7 Q12. Are the mitigation costs increasing for the project?

8 A12. No. In fact, we have deleted the mitigation cost for the project at this point in time
9 because these items have been transferred where appropriate to the contractors whom
10 have bid on the project. We did this by including known mitigations in their respective
11 contracts.

12
13 Q13. Do you believe all mitigations risks are known at this point?

14 A13. No, however, we still have contingency remaining in the project and we have included a
15 \$7M outfall modification construction line item to cover brine related mitigations that
16 may occur. This is also consistent with our July 2013 Settlement where we identified the
17 need to allocate budget to potential brine improvements.

18
19 Q14. Have the Operation and Maintenance costs increased for the project?

20 A14. Yes. We have updated the electrical load estimates for both sizes of the desalination plant
21 based on information from our design builder. We have also updated the PG&E power
22 costs based on PG&E's most current tariffs. We have updated the chemical costs and the
23 media replacements costs for the desalination plant based on the latest design information
24 from the design builder and finally we have added additional costs to monitor the both the
25 SRGB and ocean for brine discharges. See table below for a summary of these costs and
26 please also refer to Attachment 1 for additional detail.

27
28

Item	Dec. 2015 Update (2015 Dollars)		Nov. 2013 Update (2012 Dollars)	
	6.4 MGD	9.6 MGD	6.4 MGD	9.6 MGD
Energy	\$4,580,000	\$6,090,000	\$4,950,000	\$6,600,000
Chemicals	\$920,000	\$1,200,000	\$630,000	\$770,000
Labor & Miscellaneous*	\$3,360,000	\$3,680,000	\$2,730,000	\$3,090,000
Membrane and Media Replacement	\$90,000	\$120,000	\$410,000	\$550,000
General Repair and Replacement	\$1,570,000	\$1,950,000	\$1,580,000	\$1,960,000
Purchased GWR Water	\$8,750,000	NA	\$8,750,000	NA
Total O&M Annual Cost	\$19,270,000	\$13,040,000	\$19,050,000	\$12,970,000

*includes ocean and basin monitoring

Q15. Do you believe all Operation and Maintenance costs are known at this point?

A15. No. The terms of the outfall agreement needed to discharge brine out into the ocean are unknown at this point and it is likely to be an annual lease charge. We also do not know what the full extent of the groundwater monitoring program will be at this point.

Q16. How should the unknown Operation and Maintenance costs be handled?

A16. Consistent with the Settlement Agreement, we believe they should be tracked in a balancing account and reviewed in a future general rate case.

Q17. Based on these updated costs, what is the cost per acre-foot needed to make the small 6.4 MGD project plus GWR have an equal 1st year revenue requirement of the larger desal plant?

A17. Based on the information known to date, a cost of approximately \$1,325 per AF is needed to make the revenue requirements equal.

Q18. Are the GWR costs known and finalized at this point?

A18. The GWR project has a completed and certified Environmental Impact Report (EIR) and 10% design has been completed to date. On December 8, 2015, the Monterey Peninsula

1 Water Management District (MPWMD) hosted a workshop attended by many of the
2 settling parties to discuss externalities and their most current cost estimate for the project.
3 They have an estimated project cost of approximately \$72M and have spent
4 approximately \$13M to date. Thus, in total their estimate is approximately \$85M. On
5 December 9, 2015, CAW, MPWMD and MRWPCA and the Office of Ratepayers
6 Advocates (ORA) met to review the financing model and to discuss the combined
7 projects. It now appears that without significant grant contributions the economics on this
8 option could be challenging. We will be working with MRWPCA and the MPWMD
9 between now and the next Commission testimony milestone in January 2016 to attempt to
10 narrow this gap and to review in further detail their cost estimates and assumption now
11 that CAW has bid costs for several pipeline sizes and alignments. Based on the
12 information known at this point in time, a full vetting of the cost estimates by CAW,
13 MRWPCA and MPWMD and verification of the cost per AF for the GWR source will
14 need to take place before the January filing. CAW considers such vetting necessary so
15 that the information is available in January 2016 at a level that the Commission and
16 parties can rely upon it as GWR determination is considered.

17
18 Q19. Please explain how these updated capital costs have been forecasted in the model
19 described in the supplemental testimony of Jeffrey Linam.

20 A19. As previously described, we updated the capital and Operation and Maintenance costs for
21 both size desalination plants. Based on the most current project schedule (see Attachment
22 2), we forecasted monthly costs for the remaining portion of the implementation period
23 (i.e., design and permitting) and then forecasted the construction costs based on a draw
24 schedule from our design build contractor for the desal plant plus our forecasted
25 construction amounts for the remaining project items.

1 Q20. Please explain the rationale as to why the ENR Construction Cost Index is a preferable
2 measure as to the likely cost escalation for future replacement capital costs for this
3 project?

4 A20. Engineering News Record (ENR) has been indexing construction costs since 1908. The
5 Construction Cost Index (CCI) is a composite index averaged over 20 US cities that
6 includes labor, structural steel, portland cement and lumber. While I acknowledge other
7 indexes exist that pertain to water and sewer work, we believe this index is more
8 appropriate because we do not anticipate replacing large amounts of piping work in the
9 next 20 – 30 years, but rather, we will need labor and basic construction materials to cover
10 the expected replacement items.

11
12 Q21. Does this conclude your supplemental testimony?

13 A21. Yes, it does
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ATTACHMENT 1

MEMORANDUM

To: Richard Svindland, CAW

From: Ian Crooks and Chris Cook, P.E., CAW

Date: December 14, 2015

Subject: Monterey Peninsula Water Supply Project (MPWSP)
Capital and O&M Cost Estimate Update

OBJECTIVE

The objective of this technical memorandum (TM) is to update the Monterey Peninsula Water Supply Project's (MPWSP, or Project) capital and operation and maintenance (O&M) estimated costs with additional information received since the previous TM prepared by RBF Consulting (RBF) dated January 9, 2013.

BACKGROUND

For background on capital and O&M cost estimating work completed prior to 2013, refer to the background section of the TM by RBF from January 9, 2013. Since the RBF report, a design build (DB) contract has been signed for the desalination plant that is currently at 60% construction documents (CD). California American Water (CAW) has also received proposals from contractors for construction of the source water slant wells and conveyance facilities which include the "CAW-Only Facilities".

PROJECT FACILITIES

The northern facilities capital cost estimates in this memorandum are based on Table 1 below. For the previous facilities description, refer to Table 2 of RBF's TM dated January 9, 2013.

Table 1
Summary Description of Northern Facilities

Facility	6.4 MGD Desalination Option	9.6 MGD Desalination Option
INTAKE WELLS & SUPPLY/RETURN FACILITIES		
Slant Test Well	790 LF, 19-Deg, 10-Inch, Diam., 2,000 gpm	
Slant Intake Wells and Pipelines	Seven 10-in. wells, 1000 LF, 14-deg, 2000 gpm	Nine 10-in. wells, 1000 LF, 14-deg, 2000 gpm
Submersible Pump and Motor	Eight 2,000 gpm, 300 hp	Ten 2,000 gpm, 300 hp
Intake Electrical and I&C	RTUs, VFDs, Cable, MCCs	
Feedwater Pipeline	15,500 LF of 42-inch. diamond 30-inch HDPE	
Brine Return & SVR Pipelines	5,000 LF of 24-inch diam. & 6,200 LF of 12-inch	
Connection to Outfall	Metering Structure & outfall connection	
DESALINATION PLANT		
Granular Media Filters	7 pressure filters, 12 ft dia. x 48 ft long	10 pressure filters, 12 ft dia. X 48 ft long
Filtered Water Tanks	2 tanks x 0.3 MG circular, lined steel, above-ground	
Filtered Water Pumps	2 pumps x 7.9 MGD w/VFDs; 2 pumps x 4.0 MGD w/VFDs	2 pumps x 11.9 MGD w/VFDs; 2 pumps x 5.9 MGD w/VFDs
Cartridge Filters	5 filters	7 filters
Filter Backwash System	2 pumps x 15.6 MGD, constant speed	
Reverse Osmosis System	1st Pass + 40% to 2nd Pass 5 modules x 1.6 MGD w/VFDs; energy recovery on 1st Pass	1st Pass + 40% to 2nd Pass 7 modules x 1.6 MGD w/VFDs; energy recovery on 1st Pass
Post Treatment System	UV Disinfection, CO ₂ , Ca(OH) ₂ , NaOCl, NaOH, ZnPO ₄	UV Disinfection, CO ₂ , Ca(OH) ₂ , NaOCl, NaOH, ZnPO ₄
Chemical Storage and Feed	NaOCl (onsite generation), NaHSO ₃ , CO ₂ , Ca(OH) ₂ , NaOH, ZnPO ₄ , H ₂ SO ₄ , Membrane Antiscalant, Membrane Cleaning Solutions	
Filter Backwash Reclamation System	2 reclamation basins x 0.34 MG open, lined with decant; 3 reclamation pumps x 0.5 MGD w/ VFDs	
Brine Storage and Disposal	1 equalization basin x 3 MG open, lined; 2 pumps x 6 MGD w/VFDs; dechlorination system; aeration system	
Treated Water Tanks	2 tanks x 0.75 MG circular, concrete, baffled, above-ground	
Treated Water Pump Station	2 pumps x 3.2 MG w/ VFDs; 2 pumps x 1.6 MGD w/ VFDs	2 pumps x 4.8 MGD w/ VFDs; 2 pumps x 2.4 MGD w/VFDs
Salinas Valley Pump Station	2 pumps x 1.2 MG w/ VFDs;	2 pumps x 1.2 MG w/ VFDs;
Emergency Power (for DWPS)	500 kW diesel generator	750 kW diesel generator
Admin/O&M/Lab Building	6,000 SF, single story, 18 ft high	
Filter Building	3,500 SF, single story, 24 ft high	4,000 SF, single story, 24 ft high
RO and Chemical Building	30,000 SF, single story, 30 ft high 19,200 SF, 26 Ft High	
DESALINATED WATER CONVEYANCE PIPELINE (TO CAW)		
Transfer Pipeline (desal to Seaside border)	34,000 LF of 36-inch diam.	

The project facilities south of where the Transfer Pipeline meets the Seaside border, described as the “CAW-Only Facilities”, are summarized in table 2 below.

Table 2
Summary Description of Southern “CAW-Only Facilities”

Facility	6.4 MGD Desalination Option	9.6 MGD Desalination Option
CAW Conveyance System		
Transfer Pipeline (Seaside Border to Terminal Reservoir)	14,000 LF of 36-inch diam.	
Monterey Pipeline	35,000 LF of 36-inch diam.	
Monterey Pump Station	2 x 50 HP & 1 x 100 HP	
Valley Greens Pump Station	3 x 50 HP	
Terminal Reservoir		
Reservoir Structure	2 x 3 MG	
ASR System		
Wells 5 & 6	2 wells	
ASR Pipeline	13,000 LF of 16-inch diam.	

CAPITAL COST ESTIMATING METHODOLOGY AND GENERAL NOTES

Capital costs include construction costs, Land and ROW acquisition, and allowances for implementation, escalation, mitigation and contingencies. These cost estimates are built on the previous work done in RBF’s January 9, 2013 technical memoranda, using similar costing spreadsheets. Base construction costs were updated with costs indicated in the desalination plant DB contract and proposals received for both the construction of source water slant wells and conveyance facilities. Additional development of the overall project design resulted in updating of configurations, process design, quantities and materials.

The following are additional cost conditions used for estimating allowances:

- **Implementation** costs were totaled to date and then a forecast estimate was added for the additional years to complete the project. The desalination plant engineering and mobilization costs were subtracted from the implementation costs to date, since they are included in the base construction DB contract. Most, if not all, of the design effort for a 9.6 MGD desalination project will be expended even if the smaller project is constructed. For this reason, the implementation costs were estimated to be the same for both the 9.6 MGD and 6.4 MGD desalination options.
- **Escalation Allowance** was added with 12.25% for the desalination plant and 4% for all other project components, except the ASR System.
- **Contingencies** were broken down between known and estimated costs with ten percent contingency for the sum of known base construction cost and twenty-five percent contingency for the sum of estimated base construction cost.
- **Mitigation** costs were reduced to zero percent since the mitigation risk has been transferred to the contractor via the plans and specification in which the contractors bid. For new mitigation items that may appear in the next version of the Draft EIR, the remaining Contingency budget will be used to cover those costs.

SUMMARY OF UPDATED CAPITAL COST ESTIMATES

The updated capital cost estimates for the 6.4 MGD and 9.6 MGD project options are summarized below and are compared with the estimated costs at the time of the Settlement. The 2012 Dollar total capital cost did not take into account the escalation allowance, which is simply indicated as "NA".

**Table 3
Summary Capital Cost Estimate (2015 vs 2012 Dollars)**

Item	Dec. 2015 Update (2015 Dollars)		Nov. 2013 Update (2012 Dollars)	
	6.4 MGD	9.6 MGD	6.4 MGD	9.6 MGD
Base Construction Costs				
Intake Wells/Supply/Return Facilities	\$51 M	\$ 58 M	\$ 39 M	\$ 47 M
Desalination Plant	\$ 80 M	\$ 87 M	\$ 65 M	\$ 84 M
Northern Transfer Pipeline	\$14 M	\$ 14 M	\$ 11 M	\$ 11 M
CAW Convey., Term. Reser., & ASR Systems	\$ 71 M	\$ 71 M	\$ 53 M	\$ 53 M
Base Construction Subtotal	\$ 216 M	\$ 229 M ¹	\$ 168 M	\$ 195 M
Implementation Costs	\$ 52 M	\$ 52 M	\$ 43 M	\$ 43 M
ROW/Land/Outfall	\$ 15 M	\$ 15 M	\$ 8 M	\$ 9 M
Escalation Allowance	\$ 13 M	\$ 15 M	NA	NA
Contingency Allowance	\$ 26 M	\$ 28 M	\$ 42 M	\$ 57 M
Mitigation Cost Allowance	NA	NA	\$ 3 M	\$ 3 M
Brine & Potrero Rd	see Note ²	see Note ²	\$ 32 M	\$ 32 M
Total Capital Cost	\$ 322 M	\$ 338 M ¹	\$ 296 M	\$ 338 M ¹

A further comparison breakdown of the individual base construction components are described in the following capital cost sections.

Intake Wells and Supply/Return Facilities

This category of facilities includes the facilities required to obtain and deliver raw water (feedwater) to the desalination plant, to convey intermittent pump-to-waste raw water from the intake wells to the MRWPCA outfall, to convey reverse osmosis RO concentrate (brine) from the desalination plant to the MRWPCA outfall, and to convey desalinated water from the desalination plant to the CSIP irrigation water storage basin. The expected one-time fee for connection to the MRWPCA outfall along with potential outfall improvements, have been added since the Settlement. The cost breakdown summary is indicated below in Table 4:

¹ The total does not equal the sum of the above line items due to rounding.

² A brine outfall modification cost has been included in the intake/discharge portion of the estimate. No further cost has been allocated for the Potrero Road pipeline due to the promising test well results. However, the budget amount is still needed to cover the increases in pipeline costs on the project.

Table 4
Intake Wells and Supply/Return Facilities Cost Estimate (2015 vs 2012 Dollars)

Item	Dec. 2015 Update (2015 Dollars)		Nov. 2013 Update (2012 Dollars)	
	6.4 MGD	9.6 MGD	6.4 MGD	9.6 MGD
Base Construction Costs				
Slant Test Well	\$ 5.7 M	\$ 5.7 M	\$ 5.0 M	\$ 5.0 M
Slant Intake Wells	\$ 19.8 M	\$ 25.1 M	\$ 16.2 M	\$21.6 M
Intake Pump Station	NA	NA	\$ 2.9 M	\$ 4.2 M
Well Mech. Vault & Assembly	\$ 0.4 M	\$ 0.5 M	NA	NA
Submersible Pump and Motor	\$ 2.0 M	\$ 2.5 M	NA	NA
Intake Electrical and I&C	\$ 1.6 M	\$ 2.0 M	NA	NA
Beach Facilities	NA	NA	\$ 5.4 M	\$ 6.1 M
Tunnel Under Dunes	NA	NA	\$ 5.0 M	\$ 5.0 M
Comparison Subtotal	\$ 29.5 M	\$ 35.8 M	\$ 34.5 M	\$ 41.9 M
Feedwater Pipeline	\$ 10.6 M	\$ 10.6 M	\$ 2.7 M	\$ 3.1 M
Brine, SVR Pipeline, & Outfall Connection	\$ 4.2 M	\$ 4.2 M	\$ 1.9 M	\$ 1.9 M
Outfall Improvements	\$ 7.0 M	\$ 7.0 M	NA	NA
Base Construction Subtotal	\$ 51.3 M	\$ 57.6 M	\$ 39.1 M	\$ 46.9 M
Implementation Costs	\$ 13.7 M	\$ 13.7 M	\$ 9.4 M	\$ 9.4 M
ROW/Land/Outfall	\$ 5.1 M	\$ 5.1 M	\$ 2.9 M	\$ 3.7 M
Escalation Allowance	\$ 2.0 M	\$ 2.2 M	NA	NA
Contingency Allowance	\$ 7.1 M	\$ 7.9 M	\$ 10.0 M	\$ 15.0 M
Mitigation Cost Allowance	NA	NA	\$ 0.7 M	\$ 0.7 M
Total Capital Cost	\$ 79.2 M	\$ 86.5 M	\$ 62.1 M	\$ 75.7 M

The items indicated as 'NA' are based on design updates or changes in governmental agency requirements.

Desalination Plant

This category of facilities includes the facilities required to receive, filter, and desalinate the feedwater pumped from the intake wells; condition and disinfect the desalinated water; process and/or recycle residual streams from the process; store and pump desalinated water; and house equipment and personnel.

Table 5
Desalination Plant Cost Estimate (2015 vs 2012 Dollars)

Item	Dec. 2015 Update (2015 Dollars)		Nov. 2013 Update (2012 Dollars)	
	6.4 MGD	9.6 MGD	6.4 MGD	9.6 MGD
Base Construction Costs				
Plant Inlet and Pretreatment	Included in DB	Included in DB	\$ 5.4 M	\$ 7.2 M
Reverse Osmosis System	Included in DB	Included in DB	\$ 21.0 M	\$ 29.3 M
Post Treatment System	Included in DB	Included in DB	\$ 1.1 M	\$ 1.3 M
Residuals Handling and Treatment	Included in DB	Included in DB	\$ 1.1 M	\$ 1.1 M
Clearwell PS, Clearwells and DWPS	Included in DB	Included in DB	\$ 4.9 M	\$ 6.2 M
Plant Infrastructure	Included in DB	Included in DB	\$ 21.6 M	\$ 26.4 M
Engineering, Mobilization/Demob.	\$ 11.0 M	\$ 11.2 M	\$ 9.4 M	\$ 12.1 M
Base Construction Subtotal	\$ 79.8 M	\$ 87.0 M	\$ 64.5 M	\$ 83.6 M
Implementation Costs	\$ 18.0 M	\$ 18.0 M	\$ 16.7 M	\$ 16.7 M
ROW/Land	\$ 0.6 M	\$ 0.6 M	\$ 0.6 M	\$ 0.6 M
Escalation Allowance	\$ 8.4 M	\$ 9.3 M	NA	NA
Contingency Allowance	\$ 8.0 M	\$ 8.7 M	\$ 16.0 M	\$ 25.2 M
Mitigation Cost Allowance	NA	NA	\$ 1.0 M	\$ 1.0 M
Total Capital Cost	\$ 114.8 M	\$ 123.6 M	\$ 98.8 M	\$ 127.1 M

The Updated Project Cost estimate has several cells indicating 'included in DB'. This is because CAW has a DB contract for the desalination plant, so the Base Construction Subtotal is fixed and not dependent on the breakdown of subcomponents.

The 2015 Dollar escalation allowance is based off of 3.5% over 3.5 years (12.25% total). This escalation allowance is multiplied by the difference of the Base Construction Subtotal and the Engineering, Mobilization/Demobilization cost.

Northern Transfer Pipeline

Table 6 shows the transfer pipeline from the Desalination Plant to the border of Seaside.

Table 6
Northern Transfer Pipeline Cost Estimate (2015 vs 2012 Dollars)

Item	Dec. 2015 Update (2015 Dollars)		Nov. 2013 Update (2012 Dollars)	
	6.4 MGD	9.6 MGD	6.4 MGD	9.6 MGD
Base Construction Costs	\$ 13.9 M	\$ 13.9 M	\$ 10.9 M	\$ 10.9 M
Implementation Costs	\$ 3.3 M	\$ 3.3 M	\$ 2.2 M	\$ 2.2 M
ROW/Land	\$ 6.1 M	\$ 6.1M	\$ 1.5 M	\$ 1.5 M
Escalation Allowance	\$ 0.5 M	\$ 0.5 M	NA	NA
Contingency Allowance	\$ 1.4 M	\$ 1.4 M	\$ 3.7 M	\$ 3.7 M
Mitigation Cost Allowance	NA	NA	\$ 0.2 M	\$ 0.2 M
Total Capital Cost	\$ 25.2 M	\$ 25.2 M	\$ 18.5 M	\$ 18.5 M

Facilities in CAW Service Area

Table 7 shows the Facilities in the CAW Service Area (aka "CAW-Only Facilities"). This includes pipelines, pump stations, and terminal reservoir.

Table 7
Southern Transfer Pipeline Cost Estimate (2015 Dollars)

Item	Dec. 2015 Update (2015 Dollars)		Nov. 2013 Update (2012 Dollars)	
	6.4 MGD	9.6 MGD	6.4 MGD	9.6 MGD
Base Construction Costs				
Transfer Pipeline (Seaside to Term. Res.)	\$ 9.7 M	\$ 9.7 M	\$ 7.1 M	\$ 7.1 M
So. Trans. Pipeline (1 st to Seaside Turnout)			\$ 6.2 M	\$ 6.2 M
Monterey Pipeline	\$ 32.9 M	\$ 32.9 M	\$ 13.2 M	\$ 13.2 M
Monterey Transfer Pump Station	\$ 2.5 M	\$ 2.5 M	\$ 1.5 M	\$ 1.5 M
Valley Greens Pump Station	\$ 1.9 M	\$ 1.9 M	\$ 0.3 M	\$ 0.3 M
Terminal Reservoir	\$ 11.8 M	\$ 11.8 M	\$ 9.2 M	\$ 9.2 M
ASR Wells 5 & 6	\$ 8.0 M	\$ 8.0 M	\$ 6.6 M	\$ 6.6 M
ASR Pipeline	\$ 4.0 M	\$ 4.0 M	\$ 3.4 M	\$ 3.4 M
Base Construction Subtotal	\$ 70.8 M	\$ 70.8 M	\$ 53.4 M	\$ 53.4 M
Implementation Costs	\$ 16.8 M	\$ 16.8 M	\$ 14.5 M	\$ 14.5 M
ROW/Land	\$ 2.8 M	\$ 2.8 M	\$ 3.4 M	\$ 3.4 M
Escalation Allowance	\$ 2.5 M	\$ 2.5 M	NA	NA
Contingency Allowance	\$ 9.7 M	\$ 9.7 M	\$ 12.7 M	\$ 12.7 M
Mitigation Cost Allowance	NA	NA	\$ 1 M	\$ 1 M
Total Capital Cost	\$ 102.6 M	\$ 102.6 M	\$ 85.0 M	\$ 85.0 M

Refer to summary table 3 for a comparison of overall 2012 Dollars to 2015 Dollars.

O&M COST ESTIMATING METHODOLOGY AND GENERAL NOTES

The annual O&M costs for the MPWSP consist primarily of the following components:

- Energy;
- Chemicals;
- Labor;
- Membrane and Media Replacement; and
- General Repair and Replacement (R&R)

O&M cost estimates for Membrane and Media Replacement and General Repair and Replacement are presented here as annual expenses; however, a portion or all of these costs may be treated as capital expenditures in financial analysis.

Generally, the methodology to estimate O&M Costs follows the methodology described in RBF's cost report dated January 9, 2013, using updated unit cost information. The following sections within explain any differences in the cost estimating method from that used in the previous work.

SUMMARY OF UPDATED O&M COST ESTIMATES

A summary of the O&M cost estimates for the 6.4 MGD and 9.6 MGD options is shown in Table 8 and discussed in the paragraphs that follow. Detailed worksheets are also attached.

Table 8
Summary of MPWSP Annual O&M Costs (2015 vs 2012 Dollars)

Item	Dec. 2015 Update (2015 Dollars)		Nov. 2013 Update (2012 Dollars)	
	6.4 MGD	9.6 MGD	6.4 MGD	9.6 MGD
Energy	\$4,580,000	\$6,090,000	\$4,950,000	\$6,600,000
Chemicals	\$920,000	\$1,200,000	\$630,000	\$770,000
Labor & Miscellaneous*	\$3,360,000	\$3,680,000	\$2,730,000	\$3,090,000
Membrane and Media Replacement	\$90,000	\$120,000	\$410,000	\$550,000
General Repair and Replacement	\$1,570,000	\$1,950,000	\$1,580,000	\$1,960,000
Purchased GWR Water (\$2500/AF)	\$8,750,000	NA	\$8,750,000	NA
Total O&M Annual Cost	\$19,270,000	\$13,040,000	\$19,050,000	\$12,970,000

* Added cost for Ocean and Basin Monitoring

Energy Costs

Energy costs were developed for the following components:

- Pumping (intake well pump and motors, Monterey pump station, Valley Greens Pump Station, ASR wells and Seaside wells extraction);
- Treatment process (Desal Plant and Begonia Iron Removal Plant);
- Miscellaneous facility power usage

Pump headloss and flow rates were updated based on new design parameters which resulted in changes in energy consumption.

The electrical rates from 2012 were increased based on a PG&E average tariff rate increase from December 2012 to December 2015 by 13% for summer and 9% for winter.

Chemical Costs

Several chemicals are required during the pretreatment, desalination, and post-treatment processes.

The chemicals that are assumed to be required during the treatment process consist of:

- Sodium Hypochlorite (Iron oxidant, Disinfection)
- Sodium Bisulfite (Dechlorination)
- Carbon Dioxide (Alkalinity addition)
- Lime (calcite) (Remineralization)
- Sodium Hydroxide (pH adjustment)
- Various chemicals used in the Clean-in-Place (CIP) process for the RO membranes

Chemical costs were updated based on the CAW and CDM Smith actual \$/lb chemical costs. Additionally updates in chemical costs related to the desalination plant were provided in CDM Smith's 2013 report

on estimated O&M costs.

Labor Costs & Miscellaneous

The labor rates that were used in the 2012 analysis were determined to still be accurate for 2015 Dollars. Additional costs were added for Ocean and Basin Monitoring.

Media/Membrane Replacement Costs

Media and membrane replacement costs associated with reverse osmosis membranes are included in the annual O&M cost. It assumes the following:

- Media replacement of 0.5 inches loss per vessel per year
- CIP cartridge filter replacement for each train and stage, 2 per year

General Repair and Replacement

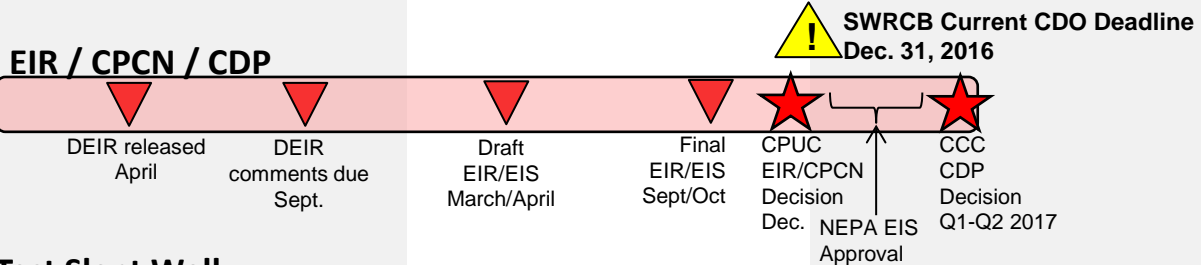
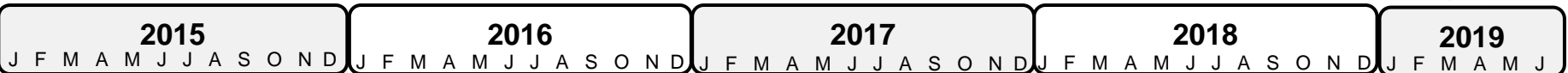
An general Repair and Replacement (R&R) cost is included in the annual O&M costs for both projects. The R&R cost is a budgeted amount based on a long term average of expenditures for the repair and/or replacement of mechanical equipment (pumps, etc.), electrical equipment, instrumentation and controls, and basic facility maintenance. As mentioned previously, some portion of these costs may be treated as capital expenses. Industry standard assumptions for this type of cost range from one percent to three percent per year as a percentage of construction cost, with the higher percentages occurring as the facilities approach the end of their useful life.

Purchased GWR Water

For now an initial value of \$2500 / AF is being used. This value may change based on new information to be filed in January 2016.

ATTACHMENT 2

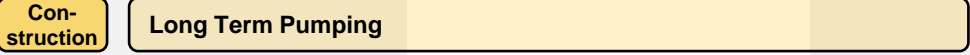
MPWSP Anticipated Schedule



On July 9, 2015, CPUC indicated schedule changes would be issued in a subsequent ruling.

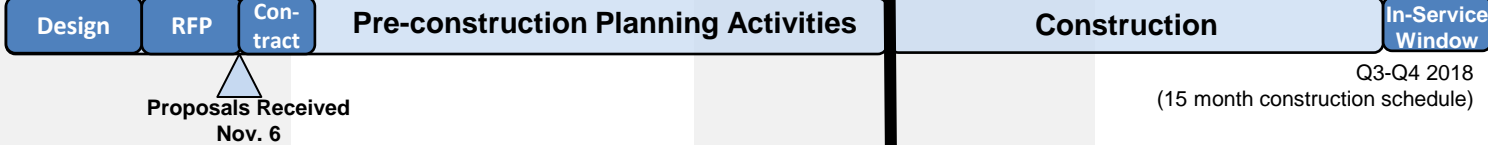
This schedule is based on our best estimate as of 11/20/2015.

Test Slant Well

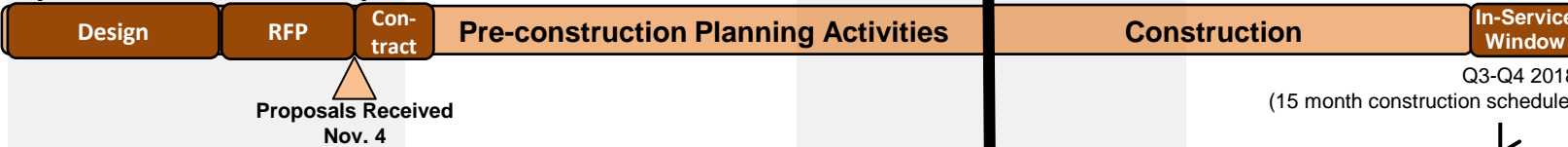


Start Construction
Q2-Q3 2017

Source Wells

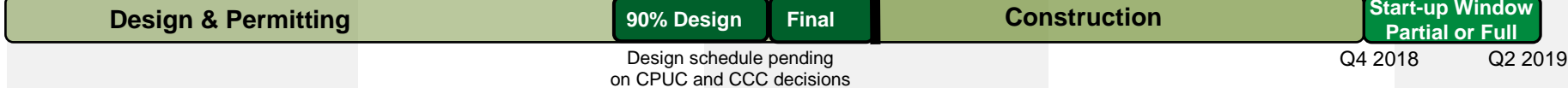


Pipelines / Tanks / Pump Stations / ASR



Evaluating schedule reductions possibilities with contractor from original 24-month schedule

Desal Plant



Note: The schedule is based on the information and assumptions available at time of update and is accurate to +/-6 months.