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

In the Matter of the Application of California-American Water Company (U 210 W) for a Certificate of Public Convenience and Necessity to Construct and Operate its Coastal Water Project to Resolve the Long-Term Water Supply Deficit in its Monterey District and to Recover All Present and Future Costs in Connection Therewith in Rates.

Application 04-09-019  
(Filed September 20, 2004;  
Amended July 14, 2005)

**REVISED DIRECT TESTIMONY OF LYNDEL W. MELTON  
(PHASE 2 REGIONAL PROJECT COST ISSUES)**

[This testimony has been revised to strike the language on page 22, line 16, beginning with "In addition" through line 20, and Exhibit LWM-9, pursuant to the ALJ's ruling issued July 21, 2009. MCWD reserves the right to offer testimony similar to that which is stricken upon a showing that the testimony is relevant to Issues A, E, F, and H identified for hearing in the scoping ruling of March 26, 2009.]

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Attorneys for  
MARINA COAST WATER DISTRICT

Revised, August 20, 2009

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**EXHIBITS**

LWM-1:	Lyndel Melton Curriculum Vitae
LWM-2:	<i>Regional Water Supply Program: EIR Project Description (June 4, 2008)</i>
LWM-3:	<i>Monterey Regional Water Supply Program Phase 1 Project Summary (December 24, 2008)</i>
LWM-4:	California Department of Public Health Letter (May 12, 2009)
LWM-5:	MCWD and MRWPCA Memorandum of Understanding for Use of Outfall
LWM-6:	Desalination Intake Well Location Map
LWM-7:	<i>North Marina Groundwater Model Evaluation of Regional Project Scenario 4f (February 26, 2009)</i>
LWM-8:	<i>Geologic Update Shoreline Recession Study Marina Coast Water District Regional Urban Water Augmentation Project Desalination Facility (April 15, 2004)</i>
<del>LWM-9:</del>	<del>Monterey Regional Waste Management District DEIR Comment Letter (March 20, 2009)</del>
LWM-10:	DEIR Regional Project Cost Estimate - Updated
LWM-11:	Institute for Homeland Security Water System Evaluation
LWM-12:	Permit Acquisition Schedule
LWM-13:	Monterey Regional Water Supply Project Schedule
LWM-14:	Regional Project Cash Flow

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In the Matter of the Application of California-American Water Company (U 210 W) for a Certificate of Public Convenience and Necessity to Construct and Operate its Coastal Water Project to Resolve the Long-Term Water Supply Deficit in its Monterey District and to Recover All Present and Future Costs in Connection Therewith in Rates.

Application 04-09-019  
(Filed September 20, 2004;  
Amended July 14, 2005)

**DIRECT TESTIMONY OF LYNDEL W. MELTON**

**I. Introduction**

Q1. Please state your name and business address.

A1. My name is Lyndel Melton, and my business address is 2001 N. Main Street, Suite 400, Walnut Creek, CA 94596

Q2. By whom are you employed and in what capacity?

A2. I work for RMC Water and Environment (formerly known as Raines, Melton and Carella), a firm that specializes in California water resource projects. I am a founding Principal of RMC and a Senior Vice President.

Q3. What are your responsibilities?

A3. My role at RMC is to engage in major water resource projects with municipal and private water utilities throughout California. The projects include water and recycled water development, watershed management, and flood protection projects.

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Q4. Briefly describe your educational background

A4. I have a Bachelor of Science in Civil Engineering from the University of the Pacific, Stockton, CA, and a Master of Civil/Environmental Engineering from Stanford University, Stanford, CA.

Q5. Are you a registered engineer?

A5. Yes, I am registered as a Civil Engineer in the State of California. I am also a Diplomate in the American Academy of Environmental Engineers.

Q6. Can you describe your employment experience?

A6. I began my career in 1975 with the California State Water Resources Control Board. In 1977 I joined Black & Veatch, a consulting engineering firm headquartered in Kansas City, Mo. I was employed in their Sacramento and Walnut Creek, California offices. In 1984 I joined Kennedy Engineers in San Francisco, California. I then worked for James M. Montgomery Engineers (later Montgomery Watson) from 1989 to 1998, at which time I left Montgomery Watson and formed Raines, Melton & Carella, which became RMC Water and Environment in 2005.

Q7. Can you briefly describe your experience in water supply projects?

A7. I have spent a great deal of my career involved in the development of water supply projects throughout California. My experience related to water supply development and management projects includes work for Monterey County Water Resources Agency, Pajaro Valley Water Management Agency, San Benito County Water District, Amador County Water Agency, Tuolumne Utilities District, South Sutter Water District, Tuolumne Utilities District, Santa Clara Valley Water District, Sunnyslope County Water District, City of Yuba City, City of Modesto, and the National Park Service, Yosemite National Park. For each of these agencies

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I led or assisted in development of engineering and environmental analyses of alternative water supply projects. In addition, my experience includes engineering development and analyses, including support to environmental analyses, for water treatment and infrastructure projects for Contra Costa Water District, Alameda County Water District, Zone 7 Water Agency, Central Coast Water Authority, San Francisco Public Utilities Commission, East Bay Municipal Utility District, City of Fairfield, City of Yuba City, Sunnyslope County Water District, San Benito County Water District, Pajaro Valley Water Management Agency, County of San Luis Obispo, Tuolumne Utilities District and other California municipal water agencies. In addition, I have been assisting the Marina Coast Water District (MCWD) in their efforts to identify and develop the incremental supply necessary to meet the redevelopment needs of the former Fort Ord.

Q8. Has your project work included planning and development of water treatment facilities?

A8. Yes. In addition to my work for the MCWD, my work includes planning and design of surface water treatment plants with capacities up to 120 mgd for the San Francisco Public Utilities Commission, Contra Costa Water District, City of Yuba City, City of Fairfield, Tuolumne Utilities District, and other California agencies. I have also been involved in the planning and evaluation of desalination facilities for the Monterey Peninsula Water Management District, Sunnyslope County Water District, San Benito County Water District, and Santa Clara Valley Water District. A copy of my current resume is attached to this testimony as Exhibit LWM-1.

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Q9. Have you testified before any regulatory agencies?

A9. Yes. I have testified before the California State Water Resources Control Board. I have also testified in California Superior Court and have participated in numerous depositions and have prepared numerous testimonies.

Q10. What is the purpose of this direct testimony?

A10. The purpose of this testimony is to provide the Commission with a summary of the Regional Water Supply Project, its estimated cost to construct and operate, its features, and to provide a contrast of the Coastal Water Project to the other two alternatives being considered by the Commission to provide a potable water supply for the greater Northern Monterey County area, including the Monterey Peninsula served by California American Water (CAW) and the area served by the Marina Coast Water District (MCWD).

Q11. Can you describe the water supply needs of the MCWD?

A11. The MCWD's need for an incremental water supply is to fulfill its obligation to provide adequate water supplies to meet the needs identified in the adopted Fort Ord Reuse Authority (FORA) base reuse plan. To meet those water supply needs, MCWD needs to develop 2,700 AFY of additional water supply beyond its existing water supplies.

Q12. Without the Regional Water Supply Project, how might MCWD meet their incremental water supply needs?

A12. MCWD has been pursuing incremental water supply projects through the Regional Urban Water Augmentation Project (RUWAP). RUWAP was conceived to provide up to 3,000 AFY of added water supply, including 300 AFY of recycled water supply to the Monterey Peninsula. The remaining 2,700 AFY was conceived

1 to include 1,000 AFY of recycled water and 1,700 AFY of desalinated water.  
2 MCWD has continued development of both of these water supply elements. The  
3 recycled water supply component has been designed, and would consist of a  
4 recycled water distribution system that would deliver recycled water produced at  
5 the Monterey Regional Water Pollution Control (MRWPCA) facility to urban  
6 irrigators within the MCWD service area in the City of Marina and within the  
7 former Fort Ord areas. Design is completed for this recycled water project, and  
8 MCWD proposes to go to bid and initiate construction later this year once funding  
9 is finalized. Funding in the form of grants from the US EPA has been introduced  
10 by U.S. Senator Barbara Boxer and U.S. House of Representatives member Sam  
11 Farr.

12  
13 Q13. Why is MCWD interested in becoming involved in the Regional Water Project?

14 A13. There are multiple reasons, but the first is economies of scale. Preliminary  
15 estimates of the cost to produce desalinated water through its own 1.5 mgd  
16 desalination plant were estimated to be \$4,180/AF. MCWD believed, and  
17 subsequent analyses have demonstrated, that a regional desalination facility that is  
18 publicly owned and financed can produce potable drinking water at a cost  
19 substantially lower than \$4,180/AF. As such, MCWD's participation in the  
20 Regional Project provides the opportunity to reduce the incremental water supply  
21 cost to MCWD and its ratepayers, as well as reduce costs to the CAW ratepayers.

22  
23 Q14. Can you describe the hypothetical "MCWD-only" desalination plant?

24 A14. The facilities would be identical to the proposed Regional Desalination Plant,  
25 except they would be designed to produce approximately 1,700 AFY of potable  
26 desalinated water. The wells would be located between the sand dunes and  
27 Highway 1, south of the sand plant and north of Reservation Road, and the  
28

1 desalination plant itself would be located on the same parcel as is being proposed  
2 for the location of the Regional Desalination Plant. Similar to the Regional  
3 Desalination Plant, brine disposal would be via the existing MRWPCA ocean  
4 outfall, and power for the desalination plant would be obtained from the MRWMD.  
5

## 6 **II. Regional Project Description**

7 Q15. The Regional Project was described in the Draft EIR. Can you please summarize  
8 the purpose of the Phase 1 Project?

9 A15. The Phase 1 Project was developed to meet the “regulatory” water supply needs of  
10 CAW, providing supplies that would allow CAW to reduce diversions from the  
11 Carmel River consistent with State Water Resources Control Board (SWRCB)  
12 Order 95-10, and reduce its reliance on Seaside Basin groundwater supplies  
13 consistent with the Seaside Basin Adjudication, dated March 27, 2006 and  
14 amended on February 9, 2007. In addition, the Phase 1 Project would deliver  
15 enough water to meet MCWD’s incremental water supply needs as described  
16 above. The Phase 1 Project would provide a total incremental regional water  
17 supply of 15,200 AFY for urban users, including 12,500 AFY for CAW to address  
18 its regulatory needs associated with the Carmel River, SWRCB Order 95-10, and  
19 the Seaside Basin Adjudication, plus 2,700 AFY for MCWD.  
20

21 Q16. Why did you develop a Phase 1 Project with subsequent phases?

22 A16. The phased approach was developed due to the schedule constraints of the Seaside  
23 Basin adjudication and SWRCB Order 95-10. These two regulatory actions  
24 essentially mandate CAW to diligently pursue a new water supply source to replace  
25 the water it currently produces above its permanent pumping rights from the  
26 Seaside Groundwater Basin and its permanent diversion rights from the Carmel  
27 River. In addition, the needs of MCWD to address the adopted Fort Ord Reuse  
28 Authority (FORA) Base Reuse Plan must also be met in a timely manner to ensure

1 economic development can occur once the current economic slowdown is over.  
2 The Phase 1 water supply needs are summarized in Table 1.

3  
4 **Table 1 - Summary of Identified Phase 1 Incremental Water Needs**

5

<b>Demand Component</b>	<b>Required Incremental Water Supply (AFY)</b>
Replacement of Carmel River water and reduced Seaside Basin pumping	12,500
Additional water demands of MCWD	2,700
<b><i>Total incremental regional water need</i></b>	<b><i>15,200</i></b>

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9  
10 The planning of the Phase 1 Project also includes consideration for future  
11 expansion to accommodate future delivery of an additional 4,500 AFY to CAW to  
12 meet the adopted land-use build-out water needs within the CAW service area,  
13 along with potential for delivery of up to 5,900 AFY to meet the needs of North  
14 Monterey County, including the Castroville, Prunedale, and Moss Landing areas.

15  
16 Q17. Can you describe the components of the Phase 1 Project?

17 A17. The Regional Project was described in the Draft EIR as a Phase 1 Project and  
18 subsequent components that would be considered for future phases. As I  
19 previously stated, the Phase 1 Project was developed to provide approximately  
20 15,200 AFY of new supply, 12,500 AFY to the CAW service area on the Monterey  
21 Peninsula and 2,700 AFY to MCWD to meet its supplemental water supply  
22 commitments for redevelopment of the former Fort Ord. For purposes of this  
23 testimony, I will be focusing my discussion on the Phase 1 Project only since only  
24 the Phase 1 Project is being considered by the Commission for implementation at  
25 this time. The water supply components incorporated in the Phase 1 Project were  
26 identified from the suite of water supply components included in the Monterey  
27 Regional Water Supply Program: EIR Project Description, dated June 4, 2008  
28 (Exhibit LWM-2) and more fully described in the Monterey Regional Water

1 Supply Program Phase 1 Project Summary, dated December 24, 2008 (Exhibit  
2 LWM-3).

3  
4 The Phase 1 Project incorporates additional levels of conservation, three supplies  
5 presently in construction and/or implementation – Seaside Groundwater Basin  
6 Aquifer Storage and Recovery (ASR), Sand City Desalination, and Urban Recycled  
7 Water portion of Regional Urban Water Augmentation Project (RUWAP), plus two  
8 additional supplies - Regional Desalination, and Surface Water. A summary of  
9 these supply components is presented in Table 2.

10 **Table 2 - Water Supply Components in the Phase 1 Project**

<b>Component</b>	<b>Supply (AFY)</b>	<b>Notes</b>
<b>Conservation</b>	-	Considered as an important opportunity for potential demand reduction.
<b>Salinas River Diversions – Urban</b>	2,980	Average available in a single year.
<b>Regional Desalination Facility</b>	10,000	Source water anticipated to be near ocean water quality.
<b>Recycled Water</b>	1,000	Delivery of recycled water for urban irrigation needs within the MCWD service area consistent with the recycled water component of the Regional Urban Water Augmentation Project (RUWAP)
<b>Sand City Desalination</b>	300	Use of the Sand City desalination facility consistent with the existing agreement between the City of Sand City and CAW.
<b>Seaside Basin ASR / In-lieu Recharge (ILR)</b>	920	Consists of injecting water from the Carmel River into the Seaside Groundwater Basin. The first phase, a 920 AFY project, is anticipated to begin implementation in 2008 and is a project of the MPWMD.
<b>Total Incremental Supply</b>	15,200	A combination of the water supply components above would be utilized to meet previously quantified regional water demands in wet, dry, and average water years.

24  
25 Q18. Can you describe how the proposed Phase 1 Regional Project water supply  
26 components shown in Table 2 are proposed to be allocated between CAW and  
27 MCWD?  
28

1 A18. The allocation of supplies in the Phase 1 Project as described in the DEIR is shown  
 2 in Table 3.

3  
 4 **Table 3 - Summary of Phase 1 Water Supply Allocations**

III.	Supply Sources					
Service Area	Regional Desalination	Urban Recycled Water	Sand City Desalination	Seaside ASR	Surface Water Treatment	Total
MCWD	1,500	1,000			200	2,700
CAW	8,500		300	920	2,780	12,500
Total	10,000	1,000	300	920	2,980	15,200

10  
 11 Q19. Can you summarize your understanding of the total water supplies assumed to be  
 12 available to both CAW and MCWD?

13 A19. The Phase 1 Regional Project presumes that, in addition to the new water supplies  
 14 being developed as a part of the Regional Project that are shown in Tables 2 and 3,  
 15 the following CAW and MCWD long-term water supplies will continue to be  
 16 utilized:

17 **Marina Coast Water District**

- 18 • 6,600 AFY from Salinas Basin groundwater wells (for former Fort Ord area)
- 19 • 4,400 AFY from Salinas Basin groundwater wells.

20 **California American Water**

- 21 • 3,376 AFY from the Carmel River
- 22 • 920 AFY from Seaside Basin Aquifer Storage and Recovery project
- 23 • 1,494 AFY from Seaside Basin groundwater wells

24 Q20. Are you aware of any changes in these water supplies?

25 A20. We are aware that CAW is now estimating a total of 1,300 to 2,000 AFY is  
 26 available from the Seaside Basin ASR project.

1 Q21. Can you describe the status of the Sand City Desalination Plant project component?

2 A21. We are not directly involved in this project, as the project is being undertaken by  
3 the City of Sand City. However, it is my understanding that the project is currently  
4 in initiation of operations, and operations are being conducted by CAW through an  
5 agreement with the City of Sand City.  
6

7 Q22. Can you describe the status of the Seaside ASR project component?

8 A22. Similar to the Sand City Desalination Plant, we are not directly involved in the  
9 Seaside ASR project, as this is a project being undertaken jointly by the Monterey  
10 Peninsula Water Management District and CAW. However, it is my understanding  
11 that this project has initiated operations and will be utilized once excess Carmel  
12 River flows are available for injection into the Seaside Groundwater Basin.  
13

14 Q23. Can you describe the status of the recycled water portion of the RUWAP?

15 A23. Design of the recycled water portion of RUWAP is complete, the permitting  
16 process is nearly complete, and we are awaiting final approval of the  
17 environmental documentation by the US Bureau of Reclamation. The US Bureau  
18 of Reclamation approval is required due to the project using recycled water  
19 produced at the Monterey Regional Water Pollution Control Agency (MRWPCA)  
20 recycled water treatment facilities that were financed, in part, by funds provided by  
21 the US Bureau of Reclamation. We anticipate that this project will proceed to bid  
22 and construction later this year, and will be operational prior to the 2011 irrigation  
23 season.  
24

25 Q24. Can you describe the Regional Desalination Plant?

26 A24. As described in the Phase 1 Project Description in the DEIR, the Regional  
27 Desalination Plant would have a daily production capacity of 10 mgd with an  
28

1 annual water production of 10,000 acre-feet per year. A 10 mgd treatment plant  
 2 could produce up to 11,200 AFY if it were operated at its full capacity 365 days  
 3 per year and it included adequate redundancy to provide for reliable service at a  
 4 full 10 mgd rate of production.

5  
 6 The selection of membranes and overall plant treatment process is dictated by the  
 7 source water and by the disinfection limits and water quality goals. The treatment  
 8 goals for the Regional Desalination plant have been developed consistent with the  
 9 California Department of Public (CDPH) requirements, with the exception of  
 10 boron, which we believe needs to be removed to a lower level for protection of  
 11 plant foliage.

12 The CDPH disinfection limits are presented in Table 4. For design purposes, we  
 13 have assumed the more stringent requirements associated with the source water  
 14 being surface water or groundwater under the direct influence of surface water,  
 15 which is consistent with the present direction of the CDPH as stated in their letter  
 16 dated May 12, 2009 (Exhibit LWM-4).

17 **Table 4 – CDPH Disinfection Limits**

18

Parameter	Units	Surface Water/GWUDI		Groundwater <sup>1</sup>	
		Minimum	Maximum	Minimum	Maximum
<i>Giardia</i>	log removal	3	5	no removal requirement	
<i>Cryptosporidium</i>	log removal	2	5.5	no removal requirement	
Viruses	log removal	4	6	no removal requirement	4

19 Footnotes:

- 20 1. Not under the direct influence of surface water.

21  
 22 The water quality treatment goals are presented in Table 5.

Table 5 – Water Quality Treatment Goals

Parameter	Unit	Raw/Feed Water	Projected Permeate	Regulation or Finished Water Goals	Goals address:
Alkalinity	mg/L as CaCO <sub>3</sub>	147	2	20 to 30	water stability
Calcium	mg/L	390	0.5	10	water stability
Magnesium	mg/L	1,240	1.5		water stability
Sodium	mg/L	10,293	46	<80	non-regulatory issues
Iron	mg/L	0.12	<0.01	<0.1	non-regulatory issue/ colored water
Manganese	mg/L	0.043	not modeled	<0.025	non-regulatory issue/ colored water
Barium	mg/L	0.11	0.0014	<1	regulation
Sulfate	mg/L	2,583	4.2	<250	regulation
Chloride	mg/L	18,506	73	<100	non-regulatory issues
Nitrate	mg/L as NO <sub>3</sub>	45	0.54	<45	regulation
Fluoride	mg/L	1.0	<0.1	1	regulation
Boron	mg/L	4.4	<0.5	<0.5	regulation/ non-regulatory issue
TDS	mg/L	33,645	130	200	non-regulatory issues
pH	units	6.9	TBD	8.5 to 9	water stability
LSI	-	-0.24	<0	-0.5 to 0.1	water stability
Chlorine Residual	mg/L	N/A	N/A	0.5 to 2	water stability
Turbidity	NTU	0.27	0.03	<0.1	regulation
Strontium	mg/L	not available	not available		
Silica	mg/L	not available	not available		

The plant processes to meet these water quality and disinfection objectives can be divided into five main categories:

1. **Pre-Treatment** – Includes potential UV pre-treatment for biofouling control, anti-scalant chemical addition, pH adjustment, and cartridge filtration.
2. **RO Process** – Includes high pressure feed pumps, RO membrane units, energy recovery units, and intermediate break tank.
3. **RO Membrane Cleaning System** – Includes all components, such as pumps and tanks, used for membrane flushing and chemical cleaning.
4. **Disinfection** – Includes UV and hypochlorite disinfection systems.
5. **Post-Treatment Conditioning** - Includes disinfection, pH adjustment, and chemical addition.

1 Q25. Have you evaluated whether more than a single pass of flow thru the reverse  
2 osmosis (RO) membranes is required to meet the stated water quality goals?

3 A25. Yes. Based on the work performed by Dr. Rhodes Trussell of Trussell  
4 Technologies, a partial second pass may be required to meet our stated water  
5 quality goal of < 0.5 mg/L for boron. If the RO treatment plant product water can  
6 be blended with other sources of lower boron concentrate water, the partial second  
7 pass may not be required. This issue is covered in greater detail in the testimony of  
8 Dr. Trussell.

9  
10 Q26. Have you reviewed this treatment process with CDPH?

11 A26. Yes. The CDPH has reviewed our proposed RO treatment process and has  
12 concurred with the approach. Further, in their letter to MCWD, dated May 12,  
13 2009, (Exhibit LWM-4, referenced above), CDPH has approved our approach to  
14 construct the proposed treatment plant and monitor source water quality from the  
15 well system during the first year of operation of the treatment plant to confirm  
16 whether the source water is groundwater under the direct influence of surface water  
17 (GWUDI). The determination of whether the source water is GWUDI is important  
18 as it controls whether the treatment plant must meet the Surface Water Treatment  
19 Rule as issued by the US EPA and administered by the CDPH. Our proposed  
20 treatment plant process provides for the level of treatment required to meet the  
21 Surface Water Treatment Rule, providing filtration and disinfection necessary to  
22 ensure 3-log Giardia, 4-log virus, and 2-log cryptosporidium reduction. The  
23 testimony of Dr. Trussell addresses this issue in greater detail.

24  
25 Q27. Have you reviewed the proposed process design for CAW's Moss Landing and  
26 North Marina Projects as it relates to the issue of single versus double pass thru the  
27 RO membranes?  
28

1 A27. Yes, we have. The processes, as we understand them, for Moss Landing and North  
2 Marina are both based on a single pass treatment approach. Based on the work  
3 completed by Dr. Trussell, we believe that the North Marina facility would require  
4 a partial double pass similar to the Regional Desalination Plant. We also believe  
5 the Moss Landing plant would require at least a similar, if not greater portion of the  
6 flow to be subject to a second pass thru RO membranes to meet the same <0.5mg/L  
7 boron goal since its source water supply is straight ocean water. This issue is  
8 covered in greater detail in the testimony of Dr. Trussell.  
9

10 Q28. How will brine disposal for the Phase 1 Regional Desalination Plant be managed?

11 A28. The brine from the desalination facility will be discharged to the ocean through the  
12 existing MRWPCA ocean outfall. Based on three and a half years of historical  
13 outfall data provided by the MRWPCA, the outfall has reached an instantaneous  
14 peak flow of 60 mgd 26 times in the last three and a half years. However, the total  
15 daily flow on those days averaged only 22 mgd, indicating that the outfall capacity  
16 was reached for only a small portion of the day. The addition of approximately 10  
17 mgd of RO brine would not significantly impact the capacity of the outfall in its  
18 current configuration. We have included the use of a brine stabilization pond/basin  
19 to modulate brine discharge into the outfall during periods of peak flow in the  
20 outfall. The outfall has a disposal capacity of 60 mgd as presently configured, and  
21 can be reconfigured to accommodate a peak disposal capacity of 80mgd. In  
22 addition, MCWD and MRWPCA have executed a Memorandum of Understanding  
23 (MOU) for use of the outfall for brine disposal. (Exhibit LWM-5)  
24

25 Q29. Has the location and number of source water supply wells changed from what is  
26 presented in the DEIR?  
27  
28

1 A29. The Regional Project Description provided for wells to be located in a broad area  
2 that included an area along the inner side of the beach dunes from north of the  
3 Salinas River to an area south of the sand mining operation and onto Armstrong  
4 Ranch property in the North Marina area. After reviewing source water locations,  
5 discussions with local land owners, and following additional groundwater  
6 modeling analyses, we have concluded that a series of wells located in the southern  
7 portion of this area, along the eastern edge of the beach dunes and west of Highway  
8 1, between the existing sand mining operation and Reservation Road, is the  
9 preferred location for the source water wells (see Exhibit LWM-6). This land is  
10 presently owned by the Armstrong Trust, and MCWD is in negotiation with the  
11 Armstrong's for the property necessary to locate the desalination source water  
12 wells.

13  
14 The wells are proposed to be vertical wells drilled and perforated in the 180-foot  
15 aquifer. The project description in the EIR indicated that 5 wells would be  
16 installed. Additional analyses conducted by Geoscience Support Services, dated  
17 February 26, 2009 (Exhibit LWM-7) indicate that 6 extraction wells pumping at a  
18 rate of 2,575 gpm will produce the source water needed for the Regional  
19 Desalination Plant. The wells will produce source water for the Regional  
20 Desalination Facility that is approximately 85% ocean water and approximately  
21 15% seawater intruded groundwater.

22  
23 Q30. Why have you proposed to utilize vertical wells instead of what is known as slant  
24 wells?

25 A30. We have proposed to utilize vertical wells for four reasons. First, vertical wells are  
26 a well established approach to groundwater pumping. Vertical wells utilizing  
27 vertical turbine pumps have been utilized since the early 1900's, and have wide-  
28

1 spread application. Conversely, the use of slant wells for ground/ocean water  
2 intakes is a relatively new application, with limited operating history. Second, the  
3 use of vertical wells provides a potentially significant environmental benefit of  
4 providing pumping of seawater intruded groundwater. An estimated 15% of the  
5 extracted water will be seawater intruded groundwater. The pumping of the  
6 seawater intruded groundwater leads to cleanup of the contaminated aquifer.  
7 Third, the cost of installation of vertical wells is less than the cost of slant wells,  
8 resulting in lower installation costs. Finally, there is the issue of beach erosion.  
9 The erosion of the beaches along Monterey Bay is well documented (see Exhibit  
10 LWM-8). Due to the need to locate the slant wells fairly close to the beach, the  
11 rate of beach erosion could lead to the necessity of replacing the wells in a  
12 timeframe that is less than their useful life. The current proposed location of the  
13 slant wells is just landward of the projected 50-year beach erosion line. This  
14 projected erosion of the beaches could lead to the need to develop a “retreat”  
15 strategy that would include likely replacement of the slant wells. This retreat  
16 strategy and well replacement, if found to be necessary, would add significant cost  
17 to the project over time.  
18

19 Q31. Is it correct that the CAW North Marina Alternative proposes to utilize slant wells?

20 A31. That is my understanding from reading the description of the North Marina  
21 Alternative in the DEIR.  
22

23 Q32. Could CAW use vertical wells as an option to slant wells for the North Marina  
24 Alternative?

25 A32. From a technical standpoint, the answer is yes, CAW could use vertical wells for  
26 the North Marina Alternative. However, institutionally, it is not clear how such a  
27 configuration would work without a regional partner. CAW witness Mark  
28

1 Schubert’s May 22, 2009 testimony describes some of the issues associated with  
2 utilization of vertical wells for the CAW North Marina Alternative.

3  
4 CAW’s proposed approach to this matter for the slant wells is to deliver the  
5 proportion of the product water that originates from groundwater to the 80-AF  
6 recycled water storage pond at the MRWPCA treatment plant. From there, the  
7 proportional groundwater would be delivered to agricultural water users in the  
8 Castroville Seawater Intrusion Project (CSIP) service area. Depending on the time  
9 of year, this water could be delivered un-blended (during winter months when  
10 agricultural demand is extremely low), or blended with recycled water during  
11 periods of the year when agricultural demand is higher. Although delivering  
12 approximately 1 mgd of water to the 80-AF pond for blending during the summer  
13 months is technically feasible, it is not clear how the pond could accept such a  
14 large volume of water during the winter months when the demand irrigation within  
15 the CSIP service area is low.

16 Presented in Table 6 is a summary of the average water deliveries to the CSIP  
17 service area. A flow of 1 mgd of water is approximately 138 acre-feet per month.  
18 As can be seen in Table 6 the average demand for irrigation water within the CSIP  
19 system is less than 138 acre-feet per month in December. This circumstance  
20 makes it appear that use of vertical wells for the CAW North Marina Alternative  
21 may not be feasible without MCWD as a partner.

22 **Table 6 – Average Monthly CSIP Deliveries**

23

Month	Total CSIP Deliveries, AF
January	213
February	310
March	885
April	1,714
May	2,181

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June	3,122
July	3,209
August	2,784
September	2,013
October	1,289
November	293
December	133
Average over period of 1998 to 2007	

Q33. What is the status of the proposed surface water treatment plant?

A33. We have prepared a preliminary design and layout of the proposed 14 mgd surface water treatment plant. The water treatment plant process is described in greater detail in the testimony of Dr. Rhodes Trussell. Major components of the surface water treatment plant include:

- Pretreatment system
- Microfiltration (MF) membrane system
- Disinfection
- Post-treatment system
- Clearwells
- On Site Residuals handling

- **Pretreatment.** Pretreatment, consisting of chemical coagulation with ferric chloride and anionic polymer, high rate sedimentation using ballasted flocculation, and automatic self-cleaning strainers would be used to remove turbidity.
- **MF Membrane Treatment.** The MF membrane treatment system would include feed pumps, MF membrane units, self-cleaning strainers, and other support systems. A backwash system would also be provided to remove particulate matter collected on the membrane surface.
- **Disinfection / Post Treatment.** To meet the disinfection requirements, both primary and secondary disinfection is required. It is expected that ultraviolet (UV) irradiation would be the primary disinfectant for inactivation of *Giardia* and

1           *Cryptosporidium* and sodium hypochlorite would be used as the primary  
2           disinfectant to inactivate viruses. Because the treated surface water and the  
3           desalinated product water from the adjacent desalination facility would be blended  
4           and delivered to urban users, they would also undergo the same post treatment  
5           process. It will be important that the water introduced into the distribution system  
6           is compatible with the existing water supply and non-corrosive to the distribution  
7           system.

- 8
- 9           • **Residuals Handling.** On site residuals management, including dewatering by a  
10           belt filter press or centrifuge and on-site drying beds. The filtrate would be  
11           returned to the pretreatment process at the headworks to the SWTP.

12           This treatment process is described in more detail in the testimony of Dr. Rhodes  
13           Trussell.

14

15           Q34. Have you reviewed this treatment process with CDPH?

16           A34. Yes, we have. CDPH has requested two years of in-stream water quality data be  
17           collected and analyzed prior to their approving our proposed process.

18

19           Q35. Have you initiated any in-stream water quality sampling?

20           A35. Yes, we have. Although this last winter was very dry, there were two occasions on  
21           which there was flow in the Salinas River in the vicinity of the proposed point of  
22           diversion from the Salinas River (the new Salinas River Diversion Facility). On  
23           both occasions, MCWD collected and then analyzed water quality samples. The  
24           laboratory results indicated nothing of significance, including non-detectable levels  
25           of pesticides and herbicides.

1 Q36. If pesticides and herbicides were determined to be present in the Salinas River at  
2 levels of significance, would the proposed treatment plant be able to remove those  
3 constituents?

4 A36. The testimony of R. Trussell addresses how we would respond to the presence of  
5 pesticides and/or herbicides in the Salinas River.  
6

7 Q37. It has been suggested that the surface water treatment component of the Regional  
8 Project might not be included in the Phase 1 Project. Is that true?

9 A37. There has been on-going discussion regarding the timing of the surface water  
10 treatment plant, particularly from Salinas Valley interests. At a minimum, the  
11 discussion generally centers on waiting until at least two years after initiation of  
12 operation of the Salinas River Diversion Facility and delivery of surface water to  
13 the existing CSIP agricultural distribution system prior to initiating a surface water  
14 diversion component for urban delivery.  
15

16 Although no firm decisions have been made at this time, we believe it is prudent to  
17 plan for a delay in implementation of the surface water treatment plant, and we are  
18 therefore planning on not including it in the Phase 1 Project.  
19

20 Q38. Do you have a plan for how the Phase 1 Project would be modified to provide  
21 adequate water to meet the needs of CAW and MCWD in the event the surface  
22 water treatment plant is not implemented as a part of the Phase 1 Project?

23 A38. Yes. There are two options. The first option would be to increase the production  
24 capacity of the Regional Desalination Plant to 13 mgd, providing incremental  
25 production capacity of the 2,980 AFY that was been programmed to come from the  
26 proposed surface water treatment plant, as described in the DEIR. This would  
27 result in the same net production of new water of approximately 13,000 AFY and  
28

1 would provide CAW with its requirement to have access, as needed, to delivery of  
2 up to 10 mgd of water from the desalination or surface water treatment facilities.

3  
4 However, CAW witness Mr. Schubert's testimony indicates CAW needs access to  
5 10 mgd of capacity on an as needed basis and 8,800 AFY of product water to meet  
6 CAW's needs. With this in mind, the Regional Desalination Plant would be  
7 operated to produce 10,500 AFY, which would provide 8,800 AFY to meet CAW's  
8 needs and 1,700 AFY to meet MCWD's needs, which along with the 1,000 AFY of  
9 recycled water being provide to MCWD by way of the RUWAP project, meets  
10 MCWD's needs of 2,700 AFY. A regional project with a production capacity of  
11 10 mgd could still provide the peak CAW demand of 10 mgd while meeting the  
12 simultaneous MCWD demand of 1,700 AFY. During periods of time when CAW  
13 was taking delivery of the full 10 mgd from the Regional Desalination Plant,  
14 MCWD would rely on its groundwater well pumping capacity to meet its peak  
15 demands.

16  
17 Q39. Does the Phase 1 Regional Project include any additional ASR facilities in the  
18 Seaside Groundwater Basin?

19 A39. Yes, two additional ASR wells are included in the Phase 1 Project, as described in  
20 the DEIR, for storage of treated surface water. Under the scenario that the surface  
21 water treatment plant is not included in the Phase 1 Project, we would propose to  
22 not include these additional ASR wells.

23  
24 Q40. What is the proposed source of power for the Phase 1 Project?

25 A40. The Phase 1 project would be powered from two different sources. The intake  
26 wells would obtain power from PG&E and the desalination facility would obtain  
27 power from by the Monterey Regional Waste Management District (MRWMD)  
28 landfill-gas powered co-generation system. The MRWMD facilities are located on

1 its 475-acre property, immediately north of the proposed regional water facilities,  
2 at the Armstrong Ranch Parcel. The MRWMD currently captures the methane  
3 produced in the landfill and uses it as fuel in a co-generation facility. More than  
4 4,600 kW of continuous power is currently being generated, with plans for  
5 expansion to a size adequate for the Regional Project treatment plant demands by  
6 2013 through expansion of the existing co-generation facility and construction of a  
7 new co-generation facility to be located in the southeast portion of the MRWMD.  
8 The power from MRWMD facilities would be delivered through a new power  
9 transmission line running directly from the co-generation facility to a substation at  
10 the regional desalination plant, providing an “over-the-fence” power delivery.  
11

12 Q41. Have you engaged with the MRWMD regarding the ability to provide landfill gas  
13 based cogeneration power for the Phase 1 Project?

14 A41. Yes, we have had numerous discussions with staff and have also made a  
15 presentation to the MRWMD Board of Directors regarding the Regional Project  
16 and the MRWMD’s providing power to the treatment facilities. ~~In addition, the~~  
17 ~~MRWMD submitted comments on the DEIR establishing their intent and desire to~~  
18 ~~provide power to a new desalination plant located adjacent to their property,~~  
19 ~~ensuring an “over-the-fence” power delivery scenario. (Exhibit LWM-9)~~  
20

21 Q42. Is this power supply only available to MCWD and the Regional Project, or others  
22 as well?

23 A42. For the sale of power from the MRWMD to a user at lower than market rates and  
24 without power transmission wheeling charges, the power must be sold in an “over-  
25 the-fence” arrangement. The MCWD has an exclusive agreement for purchase of  
26 lands on the Armstrong Ranch that are adjacent to the MRWMD facilities in North  
27 Marina. Without an agreement with MCWD, I do not see how it is possible to  
28

1 obtain the lower cost power from the MRWMD unless another parcel of land is  
2 identified that is adjacent to the MRWMD landfill operations. I am not aware of  
3 any such lands being available. Therefore, it would appear that the MRWMD  
4 landfill gas power supply is available only to MCWD.  
5

### 6 **III. Cost Estimates**

7 Q43. Have you developed cost estimates for the Phase 1 Project?

8 A43. Yes, we have developed detailed capital and O&M cost estimates for each  
9 component of the Phase 1 Project. We prepared our estimate of the cost of  
10 construction utilizing the same cost criteria employed in the CAW estimate  
11 submitted to the PUC as a part of CAW witness Mark Schubert's May 22, 2009  
12 testimony. We have also calculated annual operations and maintenance (O&M)  
13 costs. We have also converted the capital costs into annualized capital costs  
14 utilizing the cost of funds presented in the direct testimony of Mr. Thomas E.  
15 Gaffney, dated June 24, 2009. We then calculated the cost of water produced by  
16 taking the total annual cost (annualized capital cost plus annual operations and  
17 maintenance cost) and dividing this total annual cost by the average annual water  
18 production in AFY. This results in an estimated cost of water that can be used to  
19 directly compare the cost of water produced by each of the alternatives being  
20 considered by the Commission.  
21

22 Q44. What are the estimated costs for the Phase 1 Regional Project as defined in the  
23 DEIR?

24 A44. We have prepared an estimate of the capital and operations and maintenance costs  
25 for the DEIR Phase 1 Regional Project, adjusted to include 6 extraction wells  
26 (instead of the 5 presented in the DEIR) for supply to the Regional Desalination  
27 Plant. This estimate is summarized in Table 7, and is presented in greater detail in  
28 Exhibit LWM-10. We have also included in Table 7 an estimate for the Phase 1

1 Project assuming a partial second pass thru the RO system. For the partial second  
 2 pass alternative we assumed a higher pressure in the first pass and a lower overall  
 3 recovery rate than that used by CAW in their estimate.  
 4

5 **Table 7 – Estimated Cost – Phase 1 DEIR Project**

6 Construction Costs	7 DEIR Regional Project	8 DEIR Regional Project w/Partial 2 <sup>nd</sup> Pass
9 Intake Facilities	\$ 10,300,000	\$ 10,700,000
10 Desalination Plant	\$ 64,400,000	\$ 81,100,000
11 SWTP	\$ 26,000,000	\$ 26,000,000
12 Product Water Delivery	\$ 39,100,000	\$ 39,100,000
13 Common Components	\$ -	\$ -
14 Contractor's O&P	\$ 13,400,000	\$ 13,500,000
15 Implementation Costs	\$ 36,300,000	\$ 38,900,000
16 ROW/Land Acquisition	\$ -	\$ -
17 Contingencies	\$ 37,900,000	\$ 41,900,000
18 <b>Total Capital</b>	<b>\$ 227,400,000</b>	<b>\$ 251,200,000</b>
19 Total Annual O&M	\$ 9,840,000	\$ 11,040,000
20 Cost of Water (\$/AFY)	\$ 2,400	\$ 2,670
21 Annual Production (AFY)	10,500	10,500

22 The resulting unit cost of water is \$2,400/AF for the DEIR project and \$2,670/AF  
 23 for the same project adjusted to include a partial second pass of the RO system.  
 24

25 Q45. Are there other costs associated with the Phase 1 Project?

26 A45. The estimates presented in Table 7 do not include the costs of the facilities that are  
 27 common to the Regional Phase 1 Project and the CAW North Marina and Moss  
 28 Landing Alternatives, including the Terminal Reservoir, Seaside Basin ASR wells  
 and pump station, Monterey Pipeline, and Valley Greens Pump Station. These are  
 the costs for facilities that are associated with the CAW deliveries only. The  
 estimated costs for these facilities are shown in Table 8, and are the costs estimated  
 by CAW as presented in the testimony of CAW witness Mark Schubert, dated May  
 22, 2009.

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**Table 8 – Estimated Costs of Common Facilities**

Construction Costs	Common Components
Common Components	\$ 37,700,000
Contractor's O&P	included above
Implementation Costs	\$ 11,300,000
ROW/Land Acquisition	\$ 3,900,000
Contingencies	\$ 10,600,000
<b>Total</b>	<b>\$ 63,500,000</b>

Q46. Have you developed an estimate of the cost of the Phase 1 Project modified to exclude the surface water treatment plant?

A46. Yes. Our estimate for this scenario again uses the same CAW unit costs included in Mr. Schubert’s May 22, 2009 testimony. We have prepared the estimate of capital costs assuming that a partial second pass is required, and have incorporated the higher pressure requirements as described above. The unit water cost for this scenario is \$2,290/AFY and is summarized in Table 9, and is described in greater detail in Exhibit LWM - 10.

**Table 9 – Estimated Costs of Phase 1 Project  
With No Surface Water Supply**

Construction Costs	Regional Project w/no SWTP
Intake Facilities	\$ 10,700,000
Desalination Plant	\$ 81,100,000
SWTP	\$ -
Product Water Delivery	\$ 30,500,000
Common Components	\$ -
Contractor's O&P	\$ 7,300,000
Implementation Costs	\$ 26,700,000
ROW/Land Acquisition	\$ -
Contingencies	\$ 31,300,000
<b>Total Capital</b>	<b>\$ 187,600,000</b>
Total Annual O&M	\$ 11,300,000
Cost of Water (\$/AFY)	\$ 2,290
Annual Production (AFY)	10,500

1 Q47. Have you reviewed the costs of CAW's Moss Landing and North Marina  
2 Alternatives?

3 A47. Yes, we reviewed CAW's cost estimates from the information provided in  
4 Attachment K and L of CAW witness Mark Schubert's May 22, 2009 testimony.  
5 In order to properly compare the two projects. The unit costs provided in the CAW  
6 estimates were used as the basis to update the Phase 1 project costs. This includes  
7 using the same unit costs for pipelines, buildings, sitework, etc. We updated our  
8 costs to assume the percent mark up for implementation costs, contractor's  
9 overhead and profit, and project contingency. Also, based on our review of the  
10 CAW alternatives, the required quantity of water produced by desalination  
11 facilities has been reduced from what was presented in the DEIR. The DEIR  
12 identified a desalination facility production of 10,000 AFY. Based on information  
13 contained in Mr. Schubert's testimony, CAW requires an average delivery of 8,800  
14 AFY, with the ability to obtain up to 10 mgd at any time.

15 As a result of this information, the size of the Regional Desalination Facility (10  
16 mgd) remained the same, only the quantity of water produced was reduced. Based  
17 on this new information the Phase 1 Project was updated to include a total water  
18 production of 10,500 AFY (2,980 AFY from the surface water treatment facility  
19 and 7,520 from the desalination plant).

20  
21 In addition, during our review of the North Marina Alternative we discovered what  
22 appeared to be an oversight in the CAW estimate. First, it appears that a  
23 contractor's overhead and profit was specifically included only in the cost for the  
24 desalination treatment process. This means the markup appears to not have been  
25 included in their estimates of the intake facilities, desalination plant infrastructure,  
26 clearwell and pump station, and the product water pipelines. The markup was  
27 added to the Phase 1 project and in our summary of the CAW North Marina  
28

Alternative. This added an additional \$10.9 million to the capital cost of the North Marina Alternative.

Q48. How does the cost of the Phase 1 Regional Project compare to the cost of the CAW North Marina and Moss Landing Alternatives?

A48. To compare the three alternatives (Regional, North Marina, and Moss Landing), we took the cost data included in the May 22, 2009 testimony of Mr. Mark Schubert and the cost of funds data included in the May 22, 2009 testimony of Mr. David Stephenson to calculate the unit cost of water for the two CAW alternatives. Based on the updated unit and implementation costs previously described, the Phase 1 Project as described in the DEIR, but modified to include 6 extraction wells, would cost \$2,400/AF (producing 10,500 AFY) and the CAW North Marina Alternative would cost \$3,350/AF (producing 8,800 AFY), and the CAW Moss Landing Alternative would cost \$3,440/AF. These estimates assume the Phase 1 project were calculated at a public finance rate 5.15% over 30 years as presented in the June 24, 2009 testimony of Mr. Thomas E. Gaffney, and the CAW project would have a cost of capital of 8.55% over 30 years, as described in Mr. David Stephenson's May 22, 2009 testimony. These estimates are summarized in Table 10.

**Table 10 – Comparison of Estimated Costs of DEIR Based Projects**

Construction Costs	Regional Project	CAW North Marina	CAW Moss Landing
Intake Facilities	\$ 10,300,000	\$ 20,000,000	\$ 2,800,000
Desalination Plant	\$ 64,400,000	\$ 80,600,000	\$ 96,400,000
SWTP	\$ 26,000,000	\$ -	\$ -
Product Water Delivery	\$ 39,100,000	\$ 25,200,000	\$ 41,400,000
Common Components	\$ -	\$ -	\$ -
Contractor's O&P	\$ 13,400,000	\$ 10,900,000	\$ 11,200,000
Implementation Costs	\$ 36,300,000	\$ 30,700,000	\$ 27,700,000
ROW/Land Acquisition	\$ -	\$ 1,000,000	\$ 3,300,000
Contingencies	\$ 37,900,000	\$ 33,700,000	\$ 36,600,000

<b>Total Capital</b>	<b>\$ 227,400,000</b>	<b>\$ 202,100,000</b>	<b>\$ 219,400,000</b>
Total Annual O&M	\$ 9,840,000	\$ 10,100,000	\$ 9,300,000
Cost of Water (\$/AFY)	\$ 2,400	\$ 3,350	\$ 3,440
Annual Production (AFY)	10,500	8,800	8,800

These cost comparisons do not include the cost of common facilities. The O&M costs for the Regional Project and the North Marina project also do not include the annual cost associated with disposal of brine in the MRWPCA outfall since those costs are not yet available from the MRWPCA. It is expected that the cost of brine disposal would be similar for the two alternatives and will not significantly affect the overall project costs.

In addition, these cost comparisons do not incorporate consideration of the considerable reduction in cost that can be achieved through application and receipt of state and federal grants. The Regional Phase 1 Project becomes even less costly to the ratepayers when grant monies are applied. The impacts of grant funding are discussed in the testimony of Mr. Thomas E. Gaffney, dated June 24, 2009.

Q49. How does the cost of the Phase 1 Project modified to exclude the surface water supply component compare to the cost of the CAW North Marina and Moss Landing Alternatives?

A49. Based on the updated unit and implementation costs previously described, the Phase 1 Project (Scenario 1) would cost \$2,400/AF (producing 10,500 AFY) and the CAW North Marina Alternative would cost \$3,350/AF (producing 8,800 AFY), and the CAW Moss Landing Alternative would cost \$3,440/AF. These estimates assume the Phase 1 project will borrow money at a rate 5.15% over 30 years and the CAW project would have a cost of capital of 8.55% over 30 years, as described in Mr. David (Need Rest of the Name) testimony. These estimates are summarized in Table 11.

**Table 11 – Comparison of Estimated Costs with no Surface Water Supply**

Construction Costs	Regional Project w/no SWTP	CAW North Marina	CAW Moss Landing
Intake Facilities	\$ 10,700,000	\$ 20,000,000	\$ 2,800,000
Desalination Plant	\$ 81,100,000	\$ 80,600,000	\$ 96,400,000
SWTP	\$ -	\$ -	\$ -
Product Water Delivery	\$ 30,500,000	\$ 25,200,000	\$ 41,400,000
Common Components	\$ -	\$ -	\$ -
Contractor's O&P	\$ 7,300,000	\$ 10,900,000	\$ 11,200,000
Implementation Costs	\$ 26,700,000	\$ 30,700,000	\$ 27,700,000
ROW/Land Acquisition	\$ -	\$ 1,000,000	\$ 3,300,000
Contingencies	\$ 31,300,000	\$ 33,700,000	\$ 36,600,000
<b>Total Capital</b>	<b>\$ 187,600,000</b>	<b>\$ 202,100,000</b>	<b>\$ 219,400,000</b>
Total Annual O&M	\$ 11,300,000	\$ 10,100,000	\$ 9,300,000
Cost of Water (\$/AFY)	\$ 2,290	\$ 3,350	\$ 3,440
Annual Production (AFY)	10,500	8,800	8,800

Similar to the costs presented in Table 10, these cost comparisons do not include the cost of common facilities or the annual cost associated with disposal of brine in the MRWPCA outfall since those costs are not yet available from the MRWPCA. Similarly, these cost comparisons do not incorporate consideration of the considerable reduction in cost that can be achieved through application and receipt of state and federal grants. The Regional Phase 1 Project becomes even less costly to the ratepayers when grant monies are applied. The impacts of grant funding are discussed in the testimony of Mr. Thomas E. Gaffney.

Q50. What are the implications to cost if a partial double pass of the RO process is required to meet the water quality objectives?

A50. As previously described for the Regional Phase 1 Project, and as shown in Table 7, the addition of a partial second pass would increase the capital cost by approximately 10%, the annual operations and maintenance cost by approximately 12%, and the overall cost per acre foot of water produced by approximately 11%. The increase in cost is due to the additional membrane equipment and intake

1 capacity along with added costs of power and other operations and maintenance  
2 costs.

3  
4 Q51. Would the CAW alternatives have similar cost impacts if they also were designed  
5 to meet the same water quality objectives resulting in a partial second pass of the  
6 RO process?

7 A51. We would anticipate the CAW North Marina Alternative to see a similar increase  
8 in the unit cost per acre foot of water. The CAW Moss Landing Alternative may  
9 see a slightly larger increase since the source of supply is straight ocean water, not  
10 a blend of ocean water and intruded groundwater as is the case with the Regional  
11 Project.

12  
13 **IV. Other Considerations**

14 Q52. Have you considered any Homeland Security issues associated with the Phase 1  
15 Project?

16 A52. Yes, we have considered Homeland Security issues in our initial development of  
17 alternatives. We have utilized the Homeland Security Institute checklist as a basis  
18 for our initial review of Homeland Security issues. A copy of the Homeland  
19 Security Institute checklist is included in Exhibit LWM-11. We would anticipate  
20 reviewing the facilities concepts in greater detail as we progress into the design and  
21 implementation phase of the project.

22  
23 Q53. Do you know if the CAW alternatives have been evaluated relative to Homeland  
24 Security issues?

25 A53. I do not know if CAW has completed any analyses regarding Homeland Security  
26 issues, but there are several areas of concern relative to Homeland Security issues  
27 as they might relate to the Moss Landing Alternative based on the Homeland  
28 Security Institute checklist referenced above. The most significant point of

1 concern may be the location of the intake facilities in the Moss Landing Harbor.  
2 The intake facilities are open to public access since the open intake for the once  
3 thru cooling water source, which is the desalination facility source water, is located  
4 in a public marina where boats can come in close proximity to the intake.  
5

6 Q54. Are the Regional Phase 1 Project and the CAW Moss Landing and North Marina  
7 Alternatives mutually exclusive?

8 A54. Yes. While there are common components for the Phase 1 and the CAW projects  
9 (Terminal Reservoir, ARS wells and pump station, Monterey Pipeline, and Valley  
10 Greens Pump Station), the water treatment facilities are mutually exclusive. The  
11 Phase 1 Project would produce enough water to meet the needs of both CAW and  
12 the MCWD, eliminating the need for any additional treatment facilities.  
13

14 Q55. Have you considered how MCWD could finance the project?

15 A55. I rely heavily on the testimony of Mr. Thomas E. Gaffney regarding the methods of  
16 financing. One very good alternative would be a contractual arrangement between  
17 MCWD as the owner of the Regional Phase 1 Project and CAW. The agreement  
18 would provide a basis for payment from CAW to MCWD for a maximum quantity  
19 of water contracted to be delivered to CAW. The agreement would likely include a  
20 basis for payment of the capital portion of the cost of water and a basis for the  
21 incremental cost associated with operations and maintenance of the facilities.  
22 Often, these types of contracts are referred to as "Take or Pay."  
23

24 Q56. What are the cost implications of such an agreement?

25 A56. If CAW were to enter into an agreement with MCWD for water deliveries from the  
26 Phase 1 Project at the presently estimated cost of water of \$2,290/AF (Phase 1  
27 Project with no SWTP), and took on average 8,800 AFY of treated water, the  
28

1 annual average cost would be \$20,152,000. The average annual cost of water from  
2 the CAW Moss Landing Alternative assuming the same 8,800 AFY delivery would  
3 be \$30,272,000 (8,800 AFY times \$3,440/AF). The difference in these two annual  
4 costs is \$10,120,000. In the simplest of calculations, CAW could purchase up to  
5 approximately 2,900 AF less water from MCWD and the Regional Phase 1 Project  
6 per year, on average, and still have a net reduction in total water supply costs  
7 compared to the CAW Moss Landing Alternative.  
8

9 Q57. Have you conducted any additional engineering economics analyses?

10 A57. Yes we have. We undertook a net benefits evaluation and a sensitivity analysis of  
11 the net benefits evaluation.  
12

13 Q58. What is a net benefits evaluation?

14 A58. This is an evaluation based on the avoided costs of the “next best alternative.” In  
15 this case the Regional Phase 1 Project was compared to the CAW North Marina  
16 Alternative. We chose to complete the net benefits evaluation utilizing the CAW  
17 North Marina Alternative for comparative purposes since it is the lower cost of the  
18 two CAW alternatives.  
19

20 Q59. What are the results of the net benefits evaluation?

21 A59. The results of the net benefits evaluation relative to cost of water are shown in  
22 Table 12, and indicate the Regional Project has a net benefit of \$950/AF to  
23 \$1,060/AF, with and without surface water supplies, respectively.  
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**Table 12 - Net Project Benefits for the Regional Project  
(Based on Cost of Water - \$/AF)**

	Regional Project		CAW North Marina Project	Net Project Benefit (CAW minus Regional Project)
	<i>Desalination w/no Surface Water</i>	<i>With Surface Water</i>		
Cost of Water (\$/AF)	\$2,290	\$2,400	\$3,350	\$950
			\$3,350	\$1,060

Areas of cost savings that contribute to the more favorable unit costs associated with the regional project are:

- Economies of scale from treatment plant and pipeline sharing with the regional project.
- Advantages of public agency financing and project sponsorship stemming from more favorable cost of capital.
- Location of service area overlying the groundwater basin. The CAW NMP has assumed it must leave a proportion of its treated water in the basin, proposing to blend the treated water with recycled water for distribution to agricultural users in the CSIP service area.
- More economical source of power available to the Regional Phase 1 Project from cogeneration at the MRWMD facility. The MRWMD power is available at reduced cost due to regulations that allow for distribution “across the fence.”

Q60. What are the results of the sensitivity analysis of the net benefits evaluation?

A60. For the purposes of sensitivity evaluation, the Regional Project with no surface water treatment component is the scenario compared with the CAW North Marina Alternative. The first assumption tested was the opportunity to obtain grant funding. Publicly-owned desalination and water recycling facilities can qualify for Federal and State grant funding. For the purposes of this sensitivity evaluation, grant funding is assumed to total \$40 million from combined State and Federal programs. Grant funding opportunities are discussed in more detail in the testimony of Mr. Thomas E. Gaffney. The second sensitivity scenario compares a Regional Project scenario in which the capital costs increase by 50% and there is

no Federal and State funding. Lastly, the third scenario compares the Regional Project with a capital cost increase of 50% but with Federal and State grant funding.

The key observations based on the sensitivity analysis of these scenarios are:

1. The Regional Project, while being less costly in terms of cost of water produced, has the opportunity to become even less costly through the opportunity for Federal and State grants.
2. The Regional Project is the superior alternative project from the cost of water produced perspective. The Regional Project would have to suffer a more than a 50% increase in capital cost of construction costs and failure to obtain any Federal and/or State grant funding in order to exhibit costs similar to the CAW North Marina Alternative, and the CAW North Marina Alternative has been shown to be the less costly of the two CAW alternatives.
3. Thus, regional projects solve more than a single water supply need while lowering unit costs for all the participants.

The results of the sensitivity analysis are presented in Table 13.

**Table 13 – Sensitivity Analysis**

Assumptions (No SWTP Regional Phase I Project)	Net Benefit Before Sensitivity	Net Benefit After Sensitivity	Percent Change	Notes
Obtain Grant Funding	\$1,060 AF/Y	\$1,320	+24%	A publicly-owned project can qualify for Federal and State funding, Under this scenario, state and federal grant funding would reduce the costs for the Regional Project by 12%. Under this scenario the CAW North Marina

1				Alternative is 65% more expensive .	
2	Doubling of Capital Costs with no grant funding	\$1,060 AF/Y	\$450	-42%	Doubling the capital costs of the Regional Project with no Federal or State grants results in a unit water cost that is still \$450/AF less than to the CAW North Marina Alternative.
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4					
5	Doubling capital costs and obtain grant funding	\$1,060 AF/Y	\$710	-67%	Doubling the capital costs of the Regional Project but including Federal and State grants increases the unit cost of water by 67%, which is still \$710/AF less than the CAW North Marina Alternative.
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10 **V. Project Permitting**

11 Q61. Have you identified the schedule and anticipated level of effort for obtaining the  
12 necessary permits for the Regional Program?

13 A61. Yes, we have for two of the project components included in the Program. The  
14 Regional Urban Water Augmentation Project (RUWAP) was already under design  
15 prior to inclusion in the Regional Program and the permitting process was  
16 underway. Since the release of the CWP DEIR, we have met with the Regional  
17 Water Quality Control Board (RWQCB) regarding the master use permit and have  
18 also met with the City of Marina to discuss grading permits and building permits  
19 for RUWAP. We have also coordinated with the MRWPCA and other team  
20 members regarding the CDPH approval of RUWAP and specifically approval of  
21 the Title 22 report. RUWAP is anticipated to go out to bid in the fall of 2009.  
22 Permits we are currently in the process of acquiring include the Monterey County  
23 Use Permit, the Monterey Bay Unified Air Pollution Control District (MBUAPCD)  
24 Authority to Construct, and the Water Distributor's Permit.

25 The Regional Desalination Plant has an anticipated construction start date in 2010  
26 and therefore, in order to meet that scheduled construction start date, we have  
27 started the initial permitting process. The overall permitting process is quite timely  
28

1 for facilities of the nature of those included in the Regional Phase 1 Project. We  
2 have developed a schedule for obtaining the permits necessary for project  
3 implementation, which is included as Exhibit LWM -12.  
4

5 Q62. Have you initiated the permitting process for the Regional Desalination Plant?

6 A62. Yes, for the Regional Desalination Plant we have:

- 7 1. Prepared a permitting plan identifying permits required for each component  
8 of the Regional Desalination Project, for example, the intake wells or  
9 desalination plant itself.
- 10 2. Consulted with miscellaneous State and local agencies to determine  
11 permitting requirements and update the permitting plan as necessary.
- 12 3. Met with the City of Marina regarding coastal development permits for the  
13 desalination intake wells and pipeline.
- 14 4. Consulted with RWQCB regarding potential permit requirements.
- 15 5. Coordinated with the State Lands Commission regarding permit  
16 requirements.
- 17 6. Met with and communicated with Monterey County regarding necessary  
18 permits including a use permit, permit to construct and operate a  
19 desalination project, and their coastal development permits.
- 20 7. Met with the City of Sand City regarding their coastal development permit.
- 21 8. Consulted with the Federal Aviation Administration.
- 22 9. Consulted with Caltrans Aeronautical division.
- 23 10. Consulted with State Parks regarding permits for the potable water pipeline.
- 24 11. Consulted with the MBUAPCD.
- 25 12. Prepared draft permits for the various Coastal Development Permits.
- 26 13. Obtained twenty-two permit forms/applications and partially completed  
27 them.
- 28 14. Prepared and submitted preliminary maps and graphics for the permitting  
agencies to better understand the Regional Program as a whole.

25 Q63. Will all of the necessary permits be obtained in time for the anticipated  
26 construction and implementation of the Regional Program?

27 A63. Yes. The Regional Desalination Plant is one of the first projects to be implemented  
28 within the Regional Program. We developed an overall approach and a schedule

1 for the Regional Desalination Plant outlining when permits shall be acquired and  
2 when the process for each permit must begin. As stated in A2, we developed a  
3 thorough list of anticipated permits for the Regional Desalination Plant by  
4 component, in addition to expected consultations. These lists are included in  
5 Tables 1 through 8. These tables are continuously updated in order to track the  
6 status of obtaining the permit. This approach can be applied to all of the other  
7 projects included in the Regional Program. A permitting plan by component,  
8 schedule, and tracking method will all help ensure the permits are acquired prior to  
9 construction of the project.  
10

11 Q64. Have you started the permitting process for any other project components included  
12 in the Regional Program?

13 A64. As previously mentioned, the permitting process is continuing or already complete  
14 for projects that were already under development, such as RUWAP. As for the  
15 other projects included in the Regional Program, other than discussing the overall  
16 Regional Program during consultation with permitting agencies, other aspects of  
17 the permitting process have not moved forward either because they are too  
18 preliminary or it is not necessary at this point. As project development continues  
19 and anticipated construction start dates near, the same process used for the  
20 Regional Desalination Plant will be applied including the development of the  
21 permitting plan, schedule, and preliminary consultation with permitting agencies.  
22 We will most likely begin permitting for the Surface Water Treatment Plant next.  
23 Again, because we have started dialogue with many of the permitting agencies,  
24 they are already familiar with the Regional Program. This will streamline the  
25 permitting process for the other projects in the Regional Program.  
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**V. Project Schedule**

Q65. Have you developed an overall implementation schedule for the Phase 1 Project?

A65. Yes we have, and it is included as Exhibit LWM -13. In preparing this schedule we have assumed the Commission will issue the Final EIR (FEIR) consistent with the schedule shown in the Joint Scoping Memo dated March 26, 2009, and the Commission will certify the Final EIR by October 31, 2009. Further, we have assumed the Regional Desalination Plant will be constructed via a design/build approach. With these assumptions, the schedule indicates initial delivery of water in the first half of 2012.

Q66. Have you developed a cost loading for the proposed schedule that demonstrates the cash flow requirements necessary to maintain the proposed schedule?

A66. Yes, and the monthly cash flow requirements are shown in Exhibit LWM -14.

Q67. Does that conclude your Direct Testimony?

A67. Yes, it does.