Southern California Salinity Coalition
Board of Directors Meeting

DATE: December 6, 2012

TIME: 9:00 am to 11:00 am

LOCATION: SAWPA

AGENDA

9:00 am Call to Order

1. Review and Approve: Minutes of the October 11, 2012 Board of Directors Meeting
2. Receive and File: Fiscal Year 2012/2013 Financial Summary
3. Information: MWD Update (Warren Teitz)
4. Information: OWOW 2.0 Project Ranking and Proposition 84, Chapter 2, Round 2 Implementation Grant (Mark Norton)
5. Information: South Bay Water Recycling "Salinity Study"
6. Information: Concentrate Management for Inland Desalting (WRRF 11-09)
7. Information: Other Salinity Related Efforts
8. Information: Project and Fellowship Updates
9. Information: White Paper on Ocean Brine Disposal (SCSC-09-09)
10. Information: Salt Management Study (SCSC -09-01) – Workshop Report
11. Information: Reclamation/MWD/SCSC Salt Management Study Update (SCSC-09-01)
12. Information: Reclamation Conservation Grant (SCSC-11-02)
13. Information: Consideration of New Projects

Director's Comments

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 1

Date: December 6, 2012

Subject: Minutes of the June 7, 2012 Board of Directors Meeting

Recommendation: Review and Approve

Summary:

The minutes of the October 11, 2012 Board of Directors meeting are attached for review and approval.

MINUTES OF THE ORGANIZATIONAL MEETING OF THE SOUTHERN CALIFORNIA SALINITY COALITION
Date Submitted: December 6, 2012

The Board of Directors of the Southern California Salinity Coalition (SCSC) held a meeting on October 11, 2012 at 9:00 am.

The following Directors, Alternate Directors, and agency representatives, constituting a quorum of the Board, were present at the meeting:

Phil Friess	LACSD
Mark Norton	SAWPA
Harry Ruzgerian	MWD
Maria Lopez	MWD
Jim Burror	OCSD
Toby Roy	SDCWA
Jayne Joy	EMWD

Also present was Pari Dezham (IEUA) and Jeff Mosher (NWRI).

The following Directors and Alternative Directors were absent: Jason Dadakis (OCWD), Warren Teitz (MWD), Tom Love (IEUA), Celeste Cantu (SAWPA), Ray Tremblay (LACSD), Mike Wehner (OCWD), and Maria Mariscal (SDCWA).

MATTERS FOR CONSIDERATION

1. MINUTES OF THE ORGANIZATIONAL MEETING

MOTION NO. 10-1
APPROVE MINUTES OF THE ORGANIZATIONAL MEETING, JUNE 7, 2012

A motion was made to approve the minutes of the organizational meeting held June 7, 2012. The motion was seconded and approved unanimously.

2. SCSC FY 2011/12 FINANCIAL SUMMARY

MOTION NO. 10-2
RECEIVE AND FILE THE FY 2011/12 FINANCIAL SUMMARY

The Directors reviewed the Fiscal Year 2011/2012 summary financial summary report, which included the balance sheet (as of June 30, 2012), income statement (for July 1, 2011 to June 30, 2012), Administrative Report as of June 30, 2012, and a Research Funding Report.

A motion was made to receive and file the financial report. The motion was seconded and approved unanimously.

3. SCSC FY 2012/13 FINANCIAL SUMMARY

MOTION NO. 10-3
RECEIVE AND FILE THE FY 2012/13 FINANCIAL SUMMARY

The Directors reviewed the Fiscal Year 2012/2013 summary financial summary report, which included the balance sheet (as of September 30, 2012), income statement (for July 1, 2012 to September 30, 2012), Administrative Report as of September 30, 2012, and a Research Funding Report.

A motion was made to receive and file the financial report. The motion was seconded and approved unanimously.

4. MWD UPDATE

Director Ruzgerian provided a update on the activities of the Colorado River Basin Salinity Control Forum, including a report on the Paradox Deep Well Injection Project.

5. WHITE PAPER ON OCEAN BRINE DISPOSAL (SCSC-09-09)

An update on the proposed was provided. The draft summary of the September 2012 workshop was discussed. The Directors suggested that Dominic Gregorio of the SWRCB be asked to provide input on the annotated outline that would be developed as part of the project based on the meeting summary.

6. RECLAMATION/MWD/SCSC SALT MANAGEMENT STUDY UPDATE (SCSC 09-01)

Maria Lopez of MWD and Jeff Mosher provided a status update of the project. The Directors were provided a draft of the June 2012 Salinity Management Plan Study Workshop (Objective 1). The Directors suggested that staff work with MWD on revising the summary. Maria Lopez provided a brief summary of MWD efforts (Objective 4) and discussed the upcoming November 1, 2012 MWD-USBR meeting on the model update. USBR is in the process of bringing on a contractor to address updates to the model (Objective 2).

7. RECLAMATION CONSERVATION GRANT (SCSC-11-02)

The Directors discussed the SCSC project with Reclamation and NWRI on "Salinity Mitigation Strategies." The project has an emphasis on conservation savings from irrigation. A draft Request for Proposals (RFP) has been developed and a list of potential firms has been identified. The Directors suggested that staff work with MWD to refine the RFP.

8. OCEAN PLAN UPDATE

Director Friess provided an update on the state effort to update the Ocean Plan. Amendments are under consideration for ocean desalination intakes and discharges. However, little effort is on recycled water or brackish water brine. Additional public workshops are planned with a target of finalizing the effort by the end of 2013.

ADJOURNMENT

There being no further business to come before the Board, the conference call was adjourned at 11:00 am. The next meeting of the Board is scheduled for 9:00 am on December 6, 2012.

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 2

Date: October 11, 2012

Subject: Fiscal Year 2012/2013 Financial Summary

Recommendation: Information

Summary:

The un-audited Financial Report includes the following:

- Balance Sheet (As of November 30, 2012)
- Income Statement (July 1, 2011 to November 30, 2012)
- Administrative Budget Report (July 1, 2011 to November 30, 2012)
- Research Funding Report

Recommendation:

Directors receive and approve the financial reports.

Southern California Salinity Coalition
Balance Sheet
As of November 30, 2012

	Nov 30, 12
ASSETS	
Current Assets	
Checking/Savings	
1000 · Wells Fargo Operating Account	41,837.10
1050 · Wells Fargo Sweep Invest Acct	246,951.85
Total Checking/Savings	288,788.95
Total Current Assets	288,788.95
TOTAL ASSETS	**288,788.95**
LIABILITIES & EQUITY	
Equity	
3000 · Equity/Unrestricted	169,122.23
3900 · Retained Earnings	129,548.48
Net Income	-9,881.76
Total Equity	288,788.95
TOTAL LIABILITIES & EQUITY	**288,788.95**

Southern California Salinity Coalition
Profit & Loss
July 1 through November 30, 2012

	Jul - Nov 12
Income	
4300 · Other Income	4.15
Total Income	4.15
Expense	
Administrative	
5100 · Misc Admin Expenses	950.02
5500 · Salary & Benefits	2,568.92
5600 · Professional Services	4,817.13
6000 · Conferences/Meetings-SCSC	
6040 · Meals	190.53
Total 6000 · Conferences/Meetings-SCSC	190.53
Total Administrative	8,526.60
Research & Education	
8000 · Research Program	1,359.31
Total Research & Education	1,359.31
Total Expense	9,885.91
Net Income	**-9,881.76**

SOUTHERN CALIFORNIA SALINITY COALITION

Fiscal Year 2012/2013

Administrative Budget – As of November 30, 2012

SCSC Income		**FY 11/12 Budget**	**Actuals (as of 11/30/12)**	**Difference**
Member Contributions	$	80,000	$0.00	$80,000.00
Interest		40	$4.15	$35.85
Total Income	$	80,040	$4.15	$80,035.85
Administrative Expenses				
Accounting/Audit/Legal		1,000	$0.00	$1,000.00
Admin Expenses		6,000	$950.02	$5,049.98
Printing/Brochures		1,000	$0.00	$1,000.00
Postage/Delivery		100	$0.00	$100.00
Website		1,000	$0.00	$1,000.00
Salary/Benefits and Related costs		25,000	$7,386.05	$17,613.95
Professional Services		2,000	$0.00	$2,000.00
Conference/Meeting Expenses		1,500	$190.53	$1,309.47
Travel		1,000	$0.00	$1,000.00
Unobligated Project Funding		41,440	$0.00	$41,440.00
Total Expenses	$	80,040	$8,526.60	$71,513.40

SOUTHERN CALIFORNIA SALINITY COALITION

As of September 30, 2012

Research Funding Report

Income	**Obligated**	**Expended**	**Budget**
Unobligated Project Funding (from FY 2009/10)			205,768
Unobligated Project Funding (from FY 2010/11)			47,075
Unobligated Project Funding (from FY 2010/11) (Est)			63,356
FY 2012/13 Unobligated Project Funding (Estimate)			41,440
Total Income			**$294,283**
Project Budgets for FY 2012/2013			
2007/8 Projects (Obligated)	16,393	11,529	4,864
2010/11 Projects (Obligated)			7,500
Fellowship (2011/12)			10,000
White Paper on Ocean Brine Disposal (SCSC-09-09)	17,600		17,600
Salinity Management Study Update (SCSC-09-01)	100,000		100,000
Total Expenses/Obligated Budgets			**$139,964**
Remainder (Unobligated Funding)			**$217,675**

2012-2013 Expenses

	Budget	**Expenses**	**Remaining**
White Paper on Ocean Brine Disposal (SCSC-09-09)	17,600	1359.31	$16,240.69
Salinity Management Study Update (SCSC-09-01)	100,000	0	$100,000

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 3

Date: December 6, 2012

Subject: MWD Update (Warren Teitz)

Recommendation: Information

Summary:

Director Teitz will provide an update on Metropolitan Water District of Southern California's Water Quality Summary on salinity for MWD's treatment plants.

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 4

Date: December 6, 2012

Subject: OWOW 2.0 Project Ranking and Proposition 84, Chapter 2, Round 2 Implementation Grant (Mark Norton)

Recommendation: Information

Summary:

Director Norton will provide a summary of the One Water, One Watershed (OWOW) project ranking exercise for the Prop 84 grant process.

A public meeting on the project rankings will be held on Thursday, December 6, 2012, at 1:30 pm at SAWPA.

Under the SAWPA's OWOW integrated regional water management planning process, projects were solicited for inclusion in the One Water One Watershed (OWOW) 2.0 Plan. There were 136 projects submitted for rating and ranking. For the Santa Ana River region, $16 million under Round 2, with additional funding from Round 1, will be made available through SAWPA. The Project Review Committee has recommended a portfolio of projects that provide multiple benefits, are multipurpose, integrated and collaborative. The portfolio provides water use efficiency, enhanced groundwater recharge, integrated flood control/habitat benefits, non-point source pollution reduction, salt removal from local aquifers, and assistance to disadvantage communities.

An independent, expert review panel reviewed the top ranked project submissions. Although there were many meritorious projects, 22 projects and programs are recommended for funding. These projects were developed through a collaborative process involving multiple agencies and disciplines.

More information on the process is at:
http://www.sawpa.org/owow/owow-2-0-rating-and-ranking/

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 5

Date: December 6, 2012

Subject: South Bay Water Recycling "Salinity Study"

Recommendation: Information

Summary:

The Administrative Director attended a Water Recycled Workshop at the Santa Clara Valley Water District on November 30, 2012.

One of the presentations at the workshop was on: South Bay Water Recycling Salinity Study – Lessons Learned. A copy of the presentation was emailed to the SCSC Board in advance of the meeting.

The study involved:

- Salinity Source Characterization
- Review of Salinity Control Alternatives

As a result of the study, the region chose to build a 10 mgd RO facility to control salinity in the source water, rather than to rely completely on source control efforts.

We are working to get a copy of the actual report to share with SCSC member agencies.

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 6

Date: December 6, 2012

Subject: Concentrate Management for Inland Desalting (WRRF 11-09)

Recommendation: Information

Summary:

The Administrative Director attended a "Water Supply Diversification Workshop" held by the Water Research Foundation at LADWP on November 28-29, 2012.

One of the supporting documents that were provided included a summary of 7 issue papers related to concentrate management from a WateReuse Foundation workshop held in October 2012. The 6-page summary is attached. The seven issue papers were:

- Issue Paper 1: U.S. Inland Municipal Membrane Desalination: Background and General Barriers
- Issue Paper 2: Overview of Concentrate Management Options and Barriers
- Issue Paper 3: Overview of Deep Well Injection and the Underground Injection Control Program
- Issue Paper 4: Deep Well Injection: Barriers and Potential Solutions
- Issue Paper 5: Evaporation Ponds
- Issue Paper 6: High Recovery Processing
- Issue Paper 7: Overview of Concentrate Management Case Studies

The 63-page report of all 7 issue papers was emailed to the SCSC board in a separate email.

The issue papers were developed under the following WateReuse project:

Project: Desalination Concentrate Management Policy Analysis for the Arid West (WateReuse-11-09 and Water Research Foundation Project 4417)
PI: Ed Archuleta, El Paso Water Utilities
Purpose: To provide empirical and other technical evidence that suggest areas of improvement in the regulatory and policy framework, and reveal how much some potential changes may help.

Issue Papers Overview and Summary

Concentrate Management for Inland Desalting

This document provides an overview and summary of key points raised in the Issue Papers developed on the challenges and barriers associated with concentrate management (CM) for community water systems considering inland desalination (desal) as a source of municipal water supply.

Issue Paper 1: U.S. Inland Municipal Membrane Desalination: Background and General Barriers

- Brackish water desal is becoming increasingly important in many regions of the United States because traditional freshwater supply options are highly limited and, in many instances, have already been tapped at their sustainable capacity (or beyond). Inland desalting offers a viable and reliable (e.g., climate-insensitive) supply option in many areas in need of additional water, especially in the arid Southwest (SW) region of the United States.
- The level of municipal inland desal has increased appreciably in the United States since 1990, due to improvements in membrane technology and the increasing need for new water supplies. There has been a notable increase in the number of desal facilities, and also an increase in the typical size of those facilities.
- The key barriers to inland desalting are (1) the overall cost (compared to traditional water supply options drawn from freshwater), (2) relatively high energy demands, and (3) limited options for managing the brine concentrates that are the treatment residual of the membrane process. The relative cost and energy demands associated with inland desalting are becoming less of a barrier as lower-cost traditional water supply options are often unavailable for meeting additional needs and the energy efficiency of membrane processes has improved considerably.
- CM remains the largest impediment to the greater use of inland brackish water desalting in the United States, largely due to regulatory barriers and the associated costs and permitting uncertainties.

Issue Paper 2: Overview of Concentrate Management Options and Barriers

- There are several options for CM that have been applied in the United States. However, the most straightforward and economically viable CM options (i.e., discharge to surface waters, discharge to wastewater treatment plants, and land application) are not feasible in many locations such as the arid SW. They also are infeasible for desal facilities of any appreciable size (e.g., serving 40 or more households).
- Discharge to surface waters, or to sanitary sewers and wastewater treatment plants, is only viable where there is sufficient instream freshwater flow to facilitate compliance with applicable receiving surface water quality standards and associated National Pollutant Discharge Elimination System (NPDES) permits. Only extremely small desal facilities (i.e., serving less than 40 households) and/or those in locations with large freshwater receiving stream flows can use these CM options. Land application

is typically infeasible given the elevated concentrations of the brines found is in desal residuals.

- In the arid SW and many other areas (including Florida), the only viable CM options are (1) deep well injection (DWI), (2) evaporation ponds, and (3) high recovery (HR) processes. HR processes are not disposal options per se, but instead reduce the volume (which increases the concentration) of the residuals, and thus impact CM.
- Data indicate an increasing focus and reliance on DWI over time and as desal facilities get larger. DWI is an important area in which to focus the search for solutions to the CM challenge.
- There are numerous barriers to using the three viable CM options available in the arid SW. Barriers include costs, land area requirements, regulations, and many other factors. Foremost amongst these barriers—especially for DWI—are regulatory requirements and their associated costs and uncertainties.

Issue Paper 3: Overview of Deep Well Injection and the Underground Injection Control Program

- DWI is regulated under the federal Underground Injection Control (UIC) program, established under the federal Safe Drinking Water Act (SDWA). Currently there are six "classes" defined under the UIC program, and desal concentrates (and other drinking water treatment residuals, DWTRs) are officially placed under "Class I." Class I includes hazardous and nonhazardous industrial wastes, and municipal waste. Class I requirements are stringent because of the hazardous nature of some wastes in this category, and there are relatively few (i.e., less than 600) Class I wells permitted across the United States.

- Under suitable circumstances, desal concentrates also may be discharged under enhanced recovery operations at oil and gas wells, which are regulated under Class II of the UIC program. In some cases, desal concentrate may also be managed under Class V (a miscellaneous category covering a range of nonhazardous substances, including household septic wastes). These alternatives are not generally viable for municipal water utilities using desal (although the El Paso Water Utilities' groundwater desal facility operates, with operational conditions, under a Class V permit, but its discharge wells are built to the more stringent Class I standards).

- A key feature of the UIC program is the definition of an Underground Source of Drinking Water (USDW), which is intended to indicate groundwaters that are—or might conceivably in the future serve as—a source of drinking water. USDWs are currently defined as any groundwater with Total Dissolved Solids (TDS) levels of 10,000 mg/L or less.

    - Injection above or into an USDW is prohibited under Class I, and most other classes in the UIC program, regardless of (1) the overall quality of the groundwater found in the USDW zone (i.e., concentration of contaminants/constituents other than TDS), (2) the likelihood (or lack thereof) of there being a future need to use the aquifer as a drinking water supply, or (3) the ability to effectively remove relevant injectate constituents from the receiving groundwater if the aquifer is tapped for drinking water purposes in the future.

    - An "Aquifer Exemption" (AE) is required from state primacy agencies and the U.S. Environmental Protection Agency (EPA) for discharging into or above an

USDW any concentrate that exceeds a primary drinking water standard (i.e., a Maximum Contaminant Level, MCL). This issue applies to El Paso's operations under Class V (for the arsenic MCL). This also applies throughout Arizona where all Class I wells are precluded by the state's designation of all of its groundwaters as USDWs.

- Recently, Class VI was added to the UIC program for geologic sequestration of carbon dioxide, as part of a national strategy to reduce greenhouse gas emissions. The creation of a new "class" under the UIC program was difficult and took many years, despite high-level backing by two federal administrations and private energy firms. Nonetheless, the Class VI precedent suggests the possibility (albeit remote) of creating a new "Class VII" for municipal desalting concentrates. However, creating a new "Class VII" specifically for a residuals stream that is already specifically included under Class I might be very difficult, especially given the very limited resources available to EPA and its UIC program.

Issue Paper 4: Deep Well Injection: Barriers and Potential Solutions

- In the arid SW, DWI often is the only practical, viable approach to CM for public water supply desal at any practical community-size scale.

- There are a wide range of barriers to DWI, including regulatory, hydrogeologic, economic, and numerous other factors. Regulatory and related permitting issues often are the most significant obstacles.

- Reports developed in 2006 and 2007 by the Groundwater Protection Council (GWPC) and the federal UIC National Technical Workgroup (NTW)—organizations that represent UIC regulators and regulatory agencies—express a clear recognition that:

  - Some UIC regulations are unnecessarily burdensome and have no environmental benefits and, as a result, place impediments on beneficial new technologies that provide new sources of safe water supplies (e.g., desal and associated concentrate disposal) (GWPC, 2007)

  - "Existing regulations contain unnecessary administrative, construction, operation, and monitoring requirements" because they do not address the specific nature of desal concentrates or similar DWTRs. Recommendations are offered to allow for greater "flexibility and additional cost-saving opportunities" (NTW, 2006, p. 3).

- The Texas Water Development Board (TWDB) met with EPA to explore changes in Class II regulations to broaden the ability to use oil and gas wells for concentrate disposal. EPA instead suggested that Texas develop a "General Permit" for desal concentrate under Class I. Texas has since developed and issued a General Permit under Class I, and initial use of this approach by the San Antonio Water System suggests that the General Permit approach may effectively streamline the permitting process. This suggests a promising route to explore for other states, and perhaps for the federal EPA as well (i.e., to apply in states where EPA retains Class I primacy).

- Future efforts to address UIC-related regulatory hurdles to CM need to address both the *procedural* and the *technical* requirements associated with the permit process (the Texas General Permit accomplishes both). Future efforts also should recognize that desal concentrate is very different from industrial wastes in that it is not significantly impacted by process-added chemicals and, given that it instead reflects the characteristics of the source waters, the composition of desal concentrate is often very site-specific.

Issue Paper 5: Evaporation Ponds

- Evaporation ponds are a relatively low technology, low-cost, and easy-to-permit CM option for desal facilities that are very small (i.e., very low discharge volumes) and located in arid areas (i.e., high evaporation rates) with relatively flat terrain and inexpensive land costs.
- Costs for evaporation ponds can escalate quickly as the size of the facility and volume of concentrate magnify land area requirements. Costs and regulatory requirements also increase in areas with high-quality groundwater underlying the site (as dual liner, monitoring, and related regulatory requirements become more likely), and/or areas prone to large precipitation events (which increase the likelihood of flooding and overtopping).
- Solids and near solids from evaporation ponds may contain constituents at concentrations that render them hazardous, and that may need to be removed and transported to suitable landfills or other waste management facilities. This can significantly increase costs and regulatory issues.
- In some locations, netting and other approaches are required to minimize potential impacts to wildlife.
- Evaporation ponds are not likely to be a viable CM option for community water system desal facilities that are of any appreciable size (e.g., greater than 1 mgd).
- Researchers are investigating approaches to enhance net evaporation through methods such as the spraying of water into the air and evaporating water from porous vertical surfaces. These methods will likely significantly reduce evaporation pond area requirements, potentially increasing the feasibility of evaporation ponds for larger facilities.

Issue Paper 6: High Recovery Processing

- While HR approaches are not a CM option per se, they do impact the volume and characteristics of the concentrate and, thereby, impact the costs and viability of CM options. The benefits of high recovery processing include more efficient use of the water resource (i.e., to increase usable water yields). In addition, high recovery processes allow for increased product water where increased facility capacity is not viable.

- Although reducing the volume of concentrate can be useful, the increased concentration of constituents extracted from the source waters (e.g., arsenic, radionuclides) may create additional challenges for managing the concentrate.
- High recovery processes can increase disposal costs and/or technical challenges associated with conventional disposal options. For example, for deep well injection, higher salinity brine may result in higher precipitation potential within the well and injection aquifer. For evaporation ponds, the higher salinity leads to lower

evaporation rates and separately, to reduced time until the pond fills with solids. This in turn leads to increased costs associated with pond clean-out or construction of new ponds.

- Processing all the way to solids requiring disposal brings a new disposal option to municipal desal facilities—that of landfilling solids. Landfill costs can be high for disposal of solids or near solids, including costs for hauling, possible solidification, and final disposal. In some cases (likely limited), highly concentrated brines or mixed solids can be hazardous, which can significantly increase disposal costs.
- The regulatory barriers associated with high recovery processes generally are similar to those for lower salinity concentrate, with some differences. For example with deep well injection, high salinity concentrate is less likely to be suitable for Class V injection due to the concentrated nature of the brine.
- The bulk of the research has demonstrated that high recovery processing is technically feasible, but it remains costly in all its present forms. The high capital costs result from the additional processing equipment required. The high energy costs are associated with the use of thermal evaporative equipment. These energy costs can be lessened by membrane volume reduction steps, but these in turn impose high chemical costs and increase solids requiring costly disposal. As a result, high recovery processing used in many other industries is not usually cost-effective within the municipal water supply setting.

Issue Paper 7: Overview of Concentrate Management Case Studies

- The project team developed a series of water utility case studies to gain a greater understanding of the options and challenges faced by water suppliers in developing inland desal operations. The case studies are focused on challenges associated with CM in inland settings for the following utilities:

  - El Paso Water Utilities (EPWU)
  - San Antonio Water System (SAWS)
  - The City of Alamogordo, New Mexico
  - East Cherry Creek Valley (ECCV) Water and Sanitation District
  - The City of Vero Beach, Florida

- Each case study details the CM options considered and selected by the utility, the basis for the selected CM approach, and the cost and permitting issues associated with those CM options.

- All of the case study entities found that discharge to surface water or sewer was not a sustainably feasible option for CM due to their relatively large volume of concentrate they would be producing [discharge to surface water or sewer is generally only feasible for desal facilities operating at a very small scale (e.g., 0.03 mgd, which is roughly enough water for less than 40 households)].

- Although evaporation ponds were found to be a technically feasible alternative for CM in some locations, the combination of sizing and associated land requirements, and other expenses (including double lining), made this option economically prohibitive for the case study entities that considered it.

- Ultimately, all of the case study entities implemented, or plan to implement, DWI as their primary means of concentrate disposal. Alamogordo plans to implement evaporation ponds at their desal facility in order to manage concentrate from initial small-scale operations. The city may switch to DWI as production at their desal facility ramps up to 2.9 mgd.

- Although the case study entities found DWI to be the most viable option for CM, UIC permit requirements created significant challenges in terms of time and expense required to obtain full approvals, uncertainty about whether permits will be issued, and challenges associated with operating under permit conditions. The new "General Permit" provision in Texas under Class I of the UIC program may serve as a model for a more streamlined approach to DWI permitting.

References

Ground Water Protection Council (GWPC). 2007. *Ground Water Report to the Nation: A Call to Action.*

National Technical Workgroup (NTW). 2006. *Drinking Water Treatment Residual Injection Wells: Technical Recommendations.* US EPA. December1

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 7

Date: December 6, 2012

Subject: Other Salinity Related Efforts

Recommendation: Information

Summary:

The following are summaries on regional salinity-related efforts:

- Zero Discharge Desalination/Electro-dialysis Metathesis (ZDD/EDM): Eastern Municipal Water District (EMWD) continued to coordinate with Kruger, a subsidiary of Veolia Water Solutions and Technology (Veolia), University of Texas at El Paso (UTEP) and the Bureau of Reclamation for a pilot-scale Zero Discharge Desalination plant at the Menifee/Perris I Desalter. UTEP is performing additional analysis and modeling to evaluate an alternative treatment train to identify opportunities to reduce chemical and power consumption. Kruger staff will be confirming the availability of the pilot units so that a schedule for piloting at EMWD can be developed. It appears the 40 GPM unit will be available to the District sometime around the summer 2013; however, the availability of the unit and parties' commitment will be firmed up by January 2013.

- Chino II Desalter Brine Minimization – Western Municipal Water District. The Brine Minimization Facilities will utilize pellet softening as a means to treat the waste stream from the existing Chino II reverse osmosis (RO) treatment process. The intent is to remove calcium and silica (which foul membranes) from the primary RO waste stream and then add this water to the feedwater of a secondary RO process. Removal of the fouling agents is anticipated to turn the RO waste stream into salable water and increase the RO efficiency by as much as 14%. The project will result in 1,840 AFY new product water without increasing groundwater pumping. The calcium and silica removed will be converted to pellets that may be sold for industrial applications. The project will reduce brine sent for disposal to the Santa Ana Regional Interceptor (SARI) by over 65% (2.2 mgd). Given the reduced brine disposal costs and potential to sell the resulting pellets, costs of the new product water would be substantially less than imported water.

  A pilot project has been completed and a design project will begin soon. Jack Safely of WMWD has offered to attend an SCSC board meeting and present the results of the pilot study and the market study for selling the pellets.

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 8

Date: December 6, 2012

Subject: Project and Fellowship Updates

Recommendation: Information

Summary:

The following is an update of current projects:

- **Evaluation of Alternatives to Domestic Ion Exchange Water Softeners (SCSC-11-01) Principal** Investigator: Dr. Peter Fox, Arizona State University. ASU completed the final report for WateReuse Foundation. The template assisted crystallization has worked on all the waters tested. The Calcium ion selective electrode is yielding promising results as both a rapid assessment tool and a tool to ensure a physical water treatment is continuing to function.

  The IAPMO validation effort of the ANSI certification method is moving forward.

  Peter is presenting the results at a December 12, 2012 workshop at Arizona State University. Peter will provide us with a copy of his presentation.

  Follow up project: Also, at the December 12, 2012 ASU workshop, Peter will be presenting a proposal for a follow on effort titled: Development of Rapid Methods to Assess the Efficacy of Physical Water Treatment (ASU-B F2012). They are making some progress on using Calcium Ion Selective electrodes. There is evidence that the physical water treatment devices can reduce the free Calcium ion concentration in water. It will take more funding to directly correlate the reduction in free calcium ion concentration with scale prevention.

- **SCSC Graduate Student Fellowship**. As part of the NWRI fellowship program, we did not receive any viable applications for the SCSC Fellowship. As a reminder, SCSC provides a fellowship of $10,000 a year for two years to a project related to salinity. The recipient must be at a university in the region.

  Proposal: Rather than use the NWRI fellowship process, we can develop a one or two page flyer and target professors at local universities. It may be best to focus on policy issues rather than hard science research.

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 9

Date: December 6, 2012

Subject: White Paper on Ocean Brine Disposal (SCSC-09-09) – Update

Recommendation: Information

Summary:

Staff reviewed the draft meeting summary and is working with Michael Welch on a final summary to share with the "agency working group."

Michael is preparing an annotated outline for the white paper.

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 10

Date: December 6, 2012

Subject: Salt Management Study (SCSC -09-01) – Workshop Report

Recommendation: Information

A workshop was held under Objective 1 of the Salt Management Study. A revised workshop report prepared and emailed to the SCSC board in advance of the meeting.

The workshop summary was revised based on working with MWD on:

- Including an executive summary.
- Synthesizing the breakout group results.
- Developing a list of next steps.

In addition, presentations from the workshop are posted on SCSC's website at: http://www.socalsalinity.org/saltstudy.htm

Next Steps:

We would like to finalize the summary based on any SCSC board comments. The report would be provided to:

- The workshop attendees.
- The USBR contractor on the Salt Management Study.

We will also posted on the SCSC website and announce the publication through our e-newsletter.

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 11

Date: December 6, 2012

Subject: Reclamation/MWD/SCSC Salt Management Study Update (SCSC-09-01)

Recommendation: Information

Summary:

Maria Lopez (MWD), Warren Teitz (MWD) and Jeff Mosher will update the SCSC Board of Directors on the status of the project.

Here is a status report by study objective:

Objective 1: Identify Challenges and Action Steps (SCSC)

- A workshop was held on June 1 with stakeholders to identify the current and expected challenges of salinity management in Southern California and prioritize future actions.
- A workshop webpage was established on SCSC's website.
- A workshop summary was prepared and revised. (See Agenda Item 10).

Objective 2: Update Economic Impact Model (USBR)

- The USBR released a RFP to update the salinity economic impact model, including the Metropolitan module, to support federal appropriations for the Colorado River Basin Salinity Control Program and evaluate regional economic impacts to proposals affecting source water quality.
- The contract scope of work (dated September 24, 2012) is attached. The scope of work was discussed at a November 1, 2012 project meeting.
- A schedule developed by USBR is attached.
- A meeting of the "model" users, developers, and USBR contractor will be held on December 17-18, 2012 at MWD.

Objective 3: Identify and Assess Regional Salinity Conditions (SCSC)

- The task will be led by SCSC and will update understanding of Southern California salinity conditions and practices and identify opportunities to promote effective regional salinity management. The SCSC board approved $100,000 for this effort.
- A scope of work needs to be developed that will cover the focus of the effort.
- The scheduled for RFP release depends on the developing the scope of work. A target release of the RFP would be late spring 2013.

Objective 4: Assess Future Water Supply Salinity (MWD)

- The purpose this task is to assess Metropolitan's future operational capability to deliver low salinity water supplies through 2020.
- MWD has developed a internal task list and involves collecting data and conducting new analyses. The data collected will support Objective 2 – the development of the revised economic model.

Final Version: September 24, 2012

SALINITY MANAGEMENT STUDY – Economic Impacts of High Salinity Levels in Water Supply

Objective: Update the United States Bureau of Reclamation's (USBR) salinity economic impact model, including the Metropolitan module, to (1) assess the impacts of imported water salinity changes in southern California and (2) evaluate economic impacts to proposals affecting source water quality. Key project goals will be:

- Review, document and create new functions not considered in the existing economic impact model.
- Update cost values applied to existing functions for the following categories: residential, commercial, agricultural, water and wastewater utilities, industrial, groundwater, and water recycling
- Update the Economic Impact Model and prepare a report documenting the data analyses and methodology used to update the economic model

Supporting data to complete this scope of work will be provided by the project partners – Southern California Salinity Coalition (SCSC), Metropolitan Water District of Southern California (Metropolitan) and Bureau of Reclamation (Reclamation). Support will include the following:

- Reclamation will provide the current salinity model
- Metropolitan will provide their modified salinity model
- Metropolitan will provide service sub-areas based demographics, water demand and/or approximate water supply. Metropolitan service sub-areas have been revised to 10 new sub-areas instead of the former 15 sub-areas used in the 1999 Economic Impact Model.
- The project partners will all work to provide past, current and projected TDS levels in source and treated water supplies
- SCSC will provide data collected as part of the "Salinity Mitigation Strategies" research related to large landscape irrigation (golf courses, parks, cemeteries, etc) and water treatment devices (residential, commercial and industrial including water softeners and reverse osmosis systems)
- National Water Resources Institute (NWRI) is evaluating conservation potential from salinity in two sectors – large landscape irrigation and softeners/reverse osmosis devices. Data and new model functions will be provided.
- Additional information (i.e. 2012 Salinity Workshop Summary) will be provided by the project partners as available

*All draft technical memo and executive summary deliverables will be electronic via email in MS Word or Adobe PDF format. The final technical memo and executive summary report deliverable (Task 3) shall include 10 hard copies including backup discs (CD or DVD) with the documents.

PHASE 1 – SCOPE OF WORK

Task 1 – Conduct background research and literature review. Assess model categories and functions.

1. Review 1999 salinity management study report and literature cited, the Reclamation base salinity model and Metropolitan modified salinity model.
2. Conduct a literature search of salinity impacts to the categories identified in Task 2 including literature search on impacts to water using appliances and any changes in technology (a review of salinity's impacts on household appliances is needed).
3. Review and document new functions not considered in the existing economic impact model.

Task 1 Deliverable:

1. Prepare a draft technical memo that assesses the existing salinity model categories and functions and current salinity research relevant to the model categories, and addresses new model categories and/or functions that are not represented in the model. Deliver to team members for review.
2. Incorporate team comments and prepare a final technical memo

Task 2 – Update the salinity economic impact model, including the Metropolitan module.

Based on literature research in Task 1, review, update and create new economic impact functions as appropriate and cost values for the Residential category. The agricultural category requires updates in acreages, yield and prices, and the commercial-industrial category requires a CPI update.

2.1 **Residential**

1. Update costs and useful life (year estimates) of residential household plumbing and water using appliances.
2. Update residential salinity impact functions based on Task 1 literature review.

Updated and new functions should be provided for the following list of residential household plumbing and water-using appliances and other uses:

Water pipes
Water heaters (tank type)
Faucets
Garbage disposal
Clothes washers
Dish washers
Bottled water purchase
Water softeners
Detergents

Based on additional research and/or contractor work effort, new water related household appliance and residential use salinity functions should be developed for these items below. Other residential household plumbing and water-using appliances may be proposed and considered.

Water heaters
Tank-less water heaters
Coffee makers
Steam irons
Refrigerator (eg. water filters, ice cube makers)
Landscape irrigation (eg. leaching sets)
Shower (eg. door replacement, tile-tub maintenance)
Cleaning products (i.e. to address hardness issues)

2.2 **Agricultural, Commercial, Industrial For Metropolitan Sub-service Areas**

1. Update agricultural acreages, yields, and prices for each service sub-area to address salt sensitive crops including but not limited to those in the 1999 Economic Impact Model.
2. Update unit impact costs using the Consumer Price Index for commercial water uses for each sub-service area including but not limited to those in the 1999 Economic Impact Model.
3. Update unit impact costs using the Consumer Price Index for industrial water uses for each sub-service area including but not limited to those in the 1999 Economic Impact Model.

Task 2 Deliverable:

1. Prepare a draft technical memo documenting all category and function updates. Deliver to team members for review.
2. Present (eg. Powerpoint) Task 2 findings at a study team meeting
3. Incorporate team comments and prepare a final technical memo

Task 3 – Meetings

1. Attend study team kick-off meeting (one meeting).
2. Attend up to 4 study team meetings (4 meetings).
3. Attend and present Task 1 and Task 2 deliverables at Study team meetings (2 meetings).

Final Version: September 24, 2012

OPTIONAL – PHASE 2 – SCOPE OF WORK

Task 1 – Commercial-Industrial

1. Update commercial-industrial water use per Metropolitan sub-service area and 1999 study use category.
2. Review and update salinity impact functions for each commercial-industrial water use type including but not limited to those in the 1999 Economic Impact Model.

Task 2 – Water Utilities

1. Update replacement costs for water utility production and distribution (convert to per capita basis).
2. Review and revise salinity useful life functions.

Water treatment
Water distribution

Task 3 – Groundwater and Water Recycling

1. Update average advanced water treatment and/or RO costs to treat water to satisfy Regional Water Quality Control Board's TDS requirements.
2. Review and update salinity cost functions for direct and indirect groundwater recharge and water recycling impacts.

Direct groundwater recharge
Indirect groundwater recharge
Incidental recharge through wastewater discharge
Indirect groundwater recharge from deep percolation
Recycled water irrigation (i.e. leaching rate, RO costs, etc)
Commercial / Industrial impacts from recycled water use

Task 4 – Meetings

1. Attend up to 4 study team meetings (4 meetings).
2. Attend and present Task 2 and Task 3 deliverables at Study team meetings (2 meetings).

Deliverables:

1. Prepare a draft technical memo documenting all category and function updates for Task 1-3. Deliver to team members for review.
2. Present (eg. Powerpoint) Task findings at a study team meeting
3. Incorporate team comments and prepare a final technical memo

Final Version: September 24, 2012

WORK PERFORMANCE ANALYSIS

1. **Government Quality Assurance Surveillance.** Each phase of work rendered under the contract is subject to Government inspection during any or all times of the Contractor's work and after completion of the tasks. The Government's quality assurance program is not a substitute for the Contractor's quality control.

2. **Government Inspection.** The Government will monitor the Contractor's Quality Control in accordance with the standards referenced in the Performance Requirements Summary, or other remedies as allowed by the Inspection or Termination clauses.

3. **Inspection.** The Contractor shall have work complete and ready for inspection upon submittal, and in accordance with all terms of the contract. The Government may use a variety of surveillance methods to evaluate the Contractor's performance.

4. **Inspection Methods.** Both scheduled and unscheduled surveillance will be used to look at total or parts of the work. The methods of surveillance that may be used are listed below:

   100% Inspection

   Unscheduled Inspection

5. **Notification of Inspection Results**. The Government will notify the Contractor of Government inspection results in writing. The Contractor shall receive Government inspection results from the Contracting Officer. The Contractor shall acknowledge receipt of the notification by signature, time, and date. The Government may notify the Contractor of inspection results verbally. Verbal notification of defective work will be confirmed in writing. Acceptance or rejection of work will be made on the basis of the initial inspection.

6. **Criteria for Acceptance/Rejection**. Government inspections will be made according to the surveillance method(s) used, to compare the Contractor's performance to contract standards and specifications.

7. **Acceptance.** Performance of a listed service will be accepted when the standard for the service, as specified in the PRS, has been met. Defects are the Contractor's failure to meet contract clauses, standards and specifications as described in 8.

8. **Rejection.** When the Contractor's performance does not meet contract requirements or is not performed in accordance with the standard or was not performed within the allowed time frame or is not completed in its entirety, it will be considered defective and will be rejected.

9. **Correction of Defective Work**. Defective or incomplete performance of work required by the contract which is disclosed by Government inspection is subject to correction by re-performance or late performance, and the Contractor shall be required to re-perform, perform late, or otherwise correct defective work for the purpose of avoiding a reduction in the full order payment. When re-performance occurs, Government will re-inspect work designated for re-performance or late performance.

   The Contractor shall re-perform or perform late all defective (including incomplete) work disclosed by Government inspection within the following re-performance periods.

1. The Contractor shall complete re-performance of rejected draft reports and resubmit for evaluation within 30 days following notice of rejection.
2. The Contractor shall complete re-performance of rejected final reports and resubmit for evaluation within 14 days following notice of rejection.

Contractor's re-performed work shall comply with the same requirements as the initial work. Acceptance or rejection will be made on the basis of the final re-inspection.

The requirement for the Contractor to re-perform defective work will not alleviate the Contractor from responsibility to perform all other work in accordance with the terms of the contract.

Performance Requirements Summary (PRS). The PRS at Attachment 2 of the contract provide the following information:

1. **Required Performance.** Lists the contract requirements that are considered necessary for acceptable contract performance (column 1). The absence from this PRS of any contract requirement, however, shall not detract from its enforceability or limit the rights or remedies of the Government under any provisions of the contract.

2. **Performance Standards.** Describes the standards that performance of each contract requirement must meet or exceed (column 3).

3. **Method of Surveillance.** Sets forth the primary surveillance methods the Government will use to evaluate the Contractor's performance in meeting the contract requirements (column 5).

4. **Standard to be Met or Acceptable Quality Level (AQL).** Sets forth the AQL of performance for each listed service that must occur for the Contractor to receive a satisfactory rating for the listed service (column 4).

5. **Maximum Payment Percent.** Lists the maximum payment to be received for meeting the performance requirement (column 6).

6. **Positive/Negative Incentives.** Lists the incentive, negative or positive to be applied (column 7).

PERIOD OF PERFORMANCE

Period of performance will be 18 months from the date of award.

Salinity Management Study -1
Milestones Schedule
Contract Start 9/26/2012 and Contract Ends 3/25/14

	Project Milestones	Date
1	Project Kickoff Meeting	11/1/12
2	Model Specific Meetings - USBR, MWA as agreed upon by team on 11/01/12	12/11-12/2012
3	Draft Task 1 Deliverable for Comments	2/11/13
4	Comments due back in next 14 days	2/25/13
5	Incorporate comments and deliver Task 1 in next 14 days - Presentation to Team	3/11/12
6	Team Meeting - Discuss Task 2 within 14 days of delivering Task 1	3/25/13
7	Team Meeting - Follow up progress within 90 days of prior team meeting	6/24/13
8	Team Meeting - Follow up progress within 90 days of prior team meeting	9/23/13
9	Team Meeting - Follow up progress within 90 days of prior team meeting	1/13/14
10	Draft Task 2 Deliverable for Comments within 45 days of prior team meeting	2/21/14
11	Comments due back in next 14 days	3/7/14
12	Incorporate Comments and deliver Task 2 in next 14 days - Presentation to Team	3/21/14

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 12

Date: December 6, 2012

Subject: Reclamation Conservation Grant (SCSC-11-02)

Recommendation: Information

Summary:

This grant was awarded under the Southern California Area Office of the Bureau of Reclamation's conservation program to NWRI for an SCSC project effort.

Staff is working with MWD to revise the RFP.

A list of potential firms has been developed.

Southern California Salinity Coalition

Board of Directors Meeting

Agenda Item 13

Date: December 6, 2012

Subject: Consideration of New Projects

Recommendation: Information

Summary:

At the last SCSC Board meeting, the Board requested that we revisit the projects identified from our previous planning effort.

Attached are the titles and rankings of the 23 proposed projects.

Southern California Salinity Coalition
Proposed Projects – Ranked
(As of December 2009)

Priority Rankings

#1 **09-01** Southern California Salt Balance and Salinity Assessment

#1 **09-04** California Action Plan for Salinity and Water Quality

#3 **09-09** White Paper on Ocean Brine Disposal

#4 **09-06** Salinity Economic Impact Model: Update of Damage Functions

#5 **09-11** White Paper on Salinity Impacts Public Education Strategy

#6 **09-14** White Paper on Programs to Reduce Upstream Salt

#7 09-07 Salinity Fact Sheets Series

#8 09-15 White Paper on Concentrate Discharges from Membrane Plants

#9 09-08 Groundwater Salinity Research and Development Workshop

#9 09-16 Brine Reduction Study

#9 09-20 Ultimate Fate of Salt – Options

#12 09-02 White Paper on New Saltless Water Softener Technologies

#13 09-33 Educational Materials for the Landscape Industry on Agronomic Rates

#14 09-03 Workshop on Market Analysis on Water Softener Saturation Levels and Feasibility Study for a Water Softeners Incentive Program

#15 09-19 "Salinity Clearinghouse – Online Repository of Salinity Information" (MERGED WITH 09-11)

#16 09-13 Stormwater Runoff Capture Study

#17 09-32 Energy Impacts of Subsurface Ocean Intakes

#18 09-10 Advocacy Campaign for AB 1366

#18 09-25 Energy and Impacts for Reverse Osmosis (ON HOLD)

Other Projects On Hold (Not Ranked)

09-17 Study on Water Wheeling of Desalinated Waters and the Effects upon Distribution System Water Quality

09-18 Workshop on the National Academy of Sciences Desalination Report

09-22 Water Quality Objectives for Salt Ions

09-27 Modeling and Data for Salt/Nitrate in the Central Valley

09-28 IRWM Outreach