

**AGENDA**  
**SANTA MARGARITA WATER DISTRICT**  
**WATER QUALITY AND INNOVATION**  
**COMMITTEE MEETING**  
**FEBRUARY 20, 2018**

**CALL TO ORDER:** 8:30 AM, Conference Room  
26111 Antonio Parkway, Rancho Santa Margarita, CA 92688

**COMMITTEE CHAIR:** Betty H. Olson

**COMMITTEE DIRECTOR:** Charley Wilson

**1. PUBLIC FORUM**

*Persons wishing to address the Board of Directors on matters not listed on the Agenda may do so at this time. "Request To Be Heard" forms are available at the entrance to the designated meeting room. Comments are limited to three minutes, unless further time is granted by the Presiding Officer. Please submit the form to the Recording Secretary prior to the beginning of the meeting.*

*Those wishing to address the Board of Directors on any item listed on the Agenda should submit a "Request To Be Heard" form to the Recording Secretary before the Presiding Officer announces that agenda item. Your name will be called to speak at that time.*

**2. ACTION ITEMS**

2.1 Consideration and Action on Water UCI Industry-University Cooperative Research Center Membership **Page 3**

**Recommendation:** Authorize participation in the research center for an amount not to exceed \$50,000 per year for five years.

**3. INFORMATION ITEMS**

3.1 Automatic Metering Infrastructure Update **Page 5**

3.2 Update on Lake Mission Viejo Pilot Project for an Innovative Process for Removal of Constituents of Emerging Concerns for Direct Potable Reuse of Recycled Water  
**Page 8**

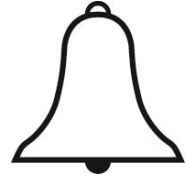
3.3 Water Quality and Innovation Committee Notes – January 16, 2018 **Page 11**

**ITEMS DISTRIBUTED TO THE BOARD LESS THAN 72 HOURS PRIOR TO MEETING**

Pursuant to Government Code section 54957.5, non-exempt public records that relate to open session agenda items and are distributed to a majority of the Board less than seventy-two (72) hours prior to the meeting will be available for public inspection in the lobby of the District's business office located at 26111 Antonio Parkway, Rancho Santa Margarita, California 92688, during regular business hours. When practical, these public records will also be made available on the District's Internet Web Site, accessible at <http://www.smwd.com>.

*Upon request, this agenda will be made available in appropriate alternative formats to persons with disabilities, as required by Section 202 of the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to Kelly Radvansky, Secretary to the Board of Directors, at (949) 459-6642 at least 48 hours before the meeting if possible.*

# Santa Margarita Water District



## MEMORANDUM

**TO:** Water Quality and Innovation Committee **DATE:** February 20, 2018  
**FROM:** Daniel Ferons  
**SUBJECT:** Consideration and Action on Water UCI Industry-University Cooperative Research Center Membership

### SUMMARY:

**Recommendation:** Authorize participation in the research center for an amount not to exceed \$50,000 per year for five years.

**Issue:** Water UCI, an interdisciplinary center in the School of Social Ecology at UC Irvine, is proposing to submit an application along with Orange County Water District, Municipal Water District of Orange County, Irvine Ranch Water District and the National Science Foundation (NSF) for a planning grant to form an industry-university cooperative research center. The planning grant is due June 21, 2018 and if accepted provides for development of a full proposal (June 2020). The center would require three distinct full members from the industry contributing \$150,000 in total annually, with matching funds provided by NSF. Industry members would form an Industry Advisory Board that would review and approve research proposals in support of the center's goals as well as benefitting those of the contributing agencies.

**Fiscal Impact:** If the District is one of three industry members, the annual contribution for the first five years would be \$50,000 commencing approximately in June 2020.

**Previously Related Action:** The District has participated in research projects with UCI previously.

**Anticipated Board Action:** This item is anticipated to go to the March 23, 2018 Board meeting with committee recommendation for Board approval.

**Adherence to Policy:** Participation would allow the District to direct research in support of its strategic goals for sustainable water supplies for the future.

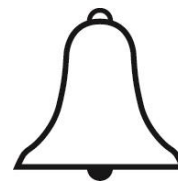
**DISCUSSION:**

The District was invited to consider participation as an Industry Member in cooperative research center with UCI with grant funding provided by the National Science Foundation (NSF). As an Industry Member, the District would serve on an Industry Advisory Board (IAB). The IAB drafts research priorities for the year, Water UCI reviews the priorities and distributes them to targeted faculty for development of proposals, Water UCI pre-screens the proposals and the IAB selects the projects for funding. A minimum of 90% of the annual contribution is required to go to direct funding of research projects.

National Science Foundation (NSF) is interested in funding research that has national significance that supports questions being asked by water and wastewater agencies. At a preliminary meeting, the agencies and Water UCI discussed potential research in sustainable water supplies for the future including storm water research, technology for monitoring of water quality, potable reuse, and emergency contaminant. Examples of research opportunities that would directly benefit the District include: development of rapid, real-time monitoring of direct potable reuse water quality, smart metering technology for improved water efficiency and customer service, and innovations in energy management impacting water usage. These advancements have the potential for substantial cost savings for the district based on value of the research generated that SMWD might otherwise need to undertake. Future discussions will be held to finalize the proposed focus of the center.

The process is to submit a proposal to obtain a planning grant. The planning grant is \$15,000 from NSF and it is used to prepare the actual center proposal. The planning proposal needs to identify interested industry members and the team is requesting the agencies commit to participation to strengthen the proposal. Funding in phase 1 is \$150,000 from NSF and a minimum match of \$150,000 from the industry members each year for five years. In Phase 2, the NSF dollar commitment reduced, with the goal to make the center self-funding in 15 years.

# Santa Margarita Water District



## MEMORANDUM

**TO:** Water Quality and Innovation Committee

**DATE:** February 20, 2018

**FROM:** Nate Adams

**SUBJECT:** Automatic Metering Infrastructure Update

### **SUMMARY:**

**Recommendation:** Discussion of the District’s approach to assessing and implementing Automatic Metering Infrastructure (AMI) technology.

**Issue:** As part of the strategic planning process, the District is reviewing the water demand for both domestic and recycled water. Automatic Metering Infrastructure (AMI) can provide greater spatial and temporal insight into how water is used by District customers. The District needs to assess how best to test and implement AMI systems and is developing a short-term pilot testing strategy to inform long-term decision-making.

**Fiscal Impact:** None – informational only. If a near-term project to convert Esencia meters to AMI is authorized, for planning purposes, the estimated costs range from \$50,000 to \$75,000.

**Previously Related Action:** The WQI committee last discussed AMI on February 14, 2017.

**Adherence to Policy:** Efficient use of water is part of the District’s strategic plan.

**Anticipated Board Action:** To be determined.

### **DISCUSSION:**

The District can charge volumetric rates because all retail connections to the District’s domestic and non-domestic water system are metered. Water meters measure the volume of water passing through a customer’s point of connection and register (record) cumulative consumption. Meters can have serviceable lives beyond twenty years and generally begin to under-register consumption as it ages. The District has over 55,000 connections (installed meters) that are broken into “cycles and routes,” such that an individual customer’s meter is read once approximately every 30 days. Obtaining a meter “read” has traditionally required staff to physically open a meter lid, read the meter register, manually enter the read into a handheld device, and drive back to the office at the end of the day to upload the reads into the billing system. In short, reading meters is a labor-intensive effort and potentially fraught with errors,

both human and software-related, that can affect utility billing and revenue, as well as customer satisfaction.

Technology exists to automate the various steps required to collect the data and bill the customers based on the meter reads. Automatic Metering Infrastructure (AMI) is a catch-all phrase that refers to a system which includes meters, communication hardware and software, and data management technology. Over the years, the District has implemented aspects of AMI technology, such as “drive-by” meters that send out radio signals that can be digitally captured by staff as they drive, rather than walk, past meters. This is referred to as Automatic Meter Read (AMR) technology and offers the benefit of expediting meter reads while reducing billing errors related to mis-reads. The District has approximately 3,000 meters that function as AMR, 75% of which are in Rancho Mission Viejo (Sendero & Esencia).

Fully developed AMI systems eliminate the human, spatial, and temporal lag of traditional utility meter reading operations. The meter, via communication and software connections, could be established which provides a straight path to the District’s billing system. The potential for near real-time meter reads at an individual meter is available to staff, as well as the customer. Some benefits include:

<b>Customer Benefits</b>	<b>District Benefits</b>
Granular Water Use Information (e.g. daily)	Reduced / Re-Deployed Labor
Proactive Leak Alerts	Reduction in Billing & Revenue Errors
High Use Notifications	Customer Service
Insurance Discounts (long-term?)	System Demand Information & Planning

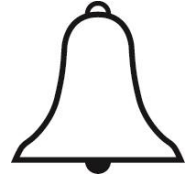
Staff is taking a near-term and long-term approach to assessing AMI technology. The near-term approach involves transitioning the existing 1,500 (and future) Neptune meters installed in the Esencia community of Rancho Mission Viejo from AMR to AMI. When installed, the Esencia meters are AMI-ready and transmit an AMI radio signal – the District just needs a permanent collector in the community to “hear” the signal. Staff has identified several potential District-owned facilities in Esencia that could house a Neptune collector (size of a large shoebox) and antennae that could “hear” the meters. We can potentially leverage the District’s existing SCADA network to bring the reads back to our billing system. Staff has asked Neptune to conduct a propagation study to assess how well the collectors could “hear” the Esencia meters, based on the facility locations. Planning level cost are estimated as follows:

- Meters: developers have purchased and installed AMI-ready Neptune meters
- Collector: \$13,000 each. Propagation study to determine unit number.
- Neptune Data Storage & Management: \$15,000
- Vendor Fees for Billing System Setup: \$15,000 (estimate)

Lessons learned in implementing this near-term AMI project will inform if, how, and where the District could further deploy AMI throughout the service area. Neptune is but one player in the AMI market, and the District should consider the AMI platforms other meter vendors offer. The District is currently pilot testing Water Pigeon AMI devices that use cameras to optically transmit reads via cell signal to the cloud for integration with billing systems. These smaller-

scale pilots will provide answers to questions on effectiveness and accuracy and may raise questions not yet considered. Staff will update the Board as lessons are learned and seek input on if and how to move forward as the costs and benefits of implementing AMI are further identified.

# Santa Margarita Water District



## MEMORANDUM

**TO:** Water Quality and Innovation Committee **DATE:** February 20, 2018

**FROM:** Don Bunts

**SUBJECT:** Update on Lake Mission Viejo Pilot Project for an Innovative Process for Removal of Constituents of Emerging Concerns for Direct Potable Reuse of Recycled Water

### SUMMARY:

**Recommendation:** Recommend increasing the budget to \$983,000 and authorize proceeding with a minimum of 20% funding from grants or partners.

**Issue:** The proposed research project is an integral part of the ongoing water reliability planning; it will provide specifics on the removal of pathogens and constituents of emerging concerns by the existing and proposed treatment process for District potable reuse in the future. The District received a proposal from University of California, Irvine (UCI) to provide research into the removal of emerging contaminants of concern for potable reuse of recycled water through comparison between ultrafiltration with reverse osmosis and ozonation with granulated activated carbon at the Lake Mission Viejo Advanced Treatment Plant. This work will directly inform the development of a project design report for approval of the specific Log Reduction Credits for the treatment processes proposed for the project.

**Fiscal Impact:** The preliminary project estimate was \$350,000 and the District had established a budget from its reserves. The budget included UCI's proposal and lab testing along with the equipment. The Project's estimated budget has increased to \$983,000 with the cost increase to accommodate modifications to the testing, purchase of the equipment, and preparing the site to provide for access. The original plan layout required modification to support the safe storage of the chemical used in the plant while providing adequate room for operation of the pilot. It is proposed that the funding be from the New Capital Project Reserves and successful outside funding.

**Previously Related Action:** Board established an original budget of \$350,000.

**Adherence to Policy:** The project scope is under the District's guiding principles of innovation and leadership through development of a process with the ultimate goal of reducing water production costs; it also supports the strategic goal for development of alternative supplies.

**Anticipated Board Action:** This item is anticipated to go to the March 23, 2018 Board meeting



with Committee recommendation for the budget increase to \$983,000 and authorization to proceed with a minimum of 20% funding from grants or partners.

### **DISCUSSION:**

The District's Strategic Plan has identified three goals and objectives:

1. Develop 30% of District potable demands from local sources and supply 50% of the District's potable water demand from outside of MWD by 2030
2. Recycle 100% of the District's wastewater
3. Six months of supply in storage

There are various methods of achieving the local supply component of the first goal stated above which include:

- Acquiring capacity in the San Juan Basin through the City of San Juan Capistrano
- Constructing rubber dams in San Juan Creek to increase the amount of storm water infiltration into San Juan Basin and utilizing the existing City of San Juan Capistrano's groundwater treatment plant
- In conjunction with the previous method, introduce recycled water behind rubber dams in San Juan Creek to increase the amount of water percolating into San Juan Basin (Indirect Potable Reuse, IPR)
- Participate in the Doheny Desalination Project
- Develop a drinking water treatment plant for treating RMVMWC groundwater
- Construct a Direct Potable Reuse (DPR) project either using recycled water directly or through a reservoir augmentation process to produce potable water

Relative to sustainable supply and District control, the implementation of an IPR or DPR project would be the most advantageous. Conventional IPR/DPR typically includes the use of reverse osmosis (RO) in the treatment train to provide the required removal amounts of pathogens and emerging constituents of concern. This is an expensive treatment method in terms of both capital and operating costs. As the acceptability of IPR/DPR gains within the water industry, more cost-effective treatment methods are being sought that will provide equivalent or greater public protections.

Through research and monitoring of trends in the industry, it has become increasingly favorable to consider ozonation/granulated activated carbon (O<sub>3</sub>/GAC) as an alternative to the RO process. The RO process is already in place and operational at the Lake Mission Viejo Advanced Water Treatment Plant which creates a relatively conducive environment for performing the side-by-side testing. It has also been observed that the various regulatory agencies that must ultimately approve the implementation of IPR/DPR are requiring pilot testing of the proposed process flow train(s) to confirm the removal of the various constituents that may be harmful to the water supply. This project will allow for the side-by-side comparison of the RO treatment process to the possible O<sub>3</sub>/GAC process using the District's probable source recycled water. It is felt that performing the pilot testing proposed by UCI in conjunction with the lab testing to be performed by the University of Arizona, enough data will be generated to demonstrate the effectiveness of the lower cost treatment which will greatly assist the District in determining the approach that may be taken to provide a sustainable drinking water supply for its customers.

The treatment approach and the testing protocols will be vetted with the Division of Drinking Water to confirm the results are acceptable for consideration as an alternative treatment method with the goal of producing potable water. Once these protocols are accepted, the testing would take place and the data would serve to validate the O<sub>3</sub>/GAC treatment process while simultaneously assisting in developing a possible final treatment process and costs that would be associated to a full-scale project. The ability to incorporate the O<sub>3</sub>/GAC process is anticipated to provide capital cost savings in the millions of dollars and provide at least \$300-\$400 per acre-ft of water produced in operating treatment cost savings, that would equate to a minimum of \$750,000 per year in reduced costs or a present value of \$16 million.

The proposed research is phase one of a multiple-phase approach to implementation of potable reuse within the District. The research data and analysis will be used to inform the development of a project design report for approval of the specific Log Reduction Credits for the treatment processes proposed for the project. In addition, the research can be utilized to inform the legislature, the State Board and the customers on the ability of the District to safely remove pathogens and help frame regulations for potable reuse.

Staff is currently in communication with the following organizations to secure external funding to offset the District's costs. The committee will be updated based on the success in obtaining external funding with a goal of a minimum of 20% of outside funding to help offset the costs associated to this testing:

- MWD Foundational Action Funding
- Water Research Foundation
- United States Bureau of Reclamation
- State of California Department of Water Resources
- California Energy Commission
- Other Water Agencies including El Toro Water District and Irvine Ranch Water District

**COMMITTEE NOTES  
SANTA MARGARITA WATER DISTRICT  
WATER QUALITY AND INNOVATION  
COMMITTEE MEETING  
JANUARY 16, 2018**

**CALL TO ORDER:** 8:30 AM, Conference Room  
26111 Antonio Parkway, Rancho Santa Margarita, CA 92688

**COMMITTEE CHAIR:** Charley Wilson

**COMMITTEE DIRECTOR:** Betty H. Olson  
[Call to Order @ 8:30 AM](#)

**ATTENDEES**

**Members Present:** Director Betty H. Olson (Chair) and Director Wilson (Member)

**Staff Present:** Daniel Ferons, Don Bunts, Robert Grantham, Rich Kisse, Daniel Peterson, Rachel Pasco, and Stacey Bruno

**Others Present:** Roy Wolfe and Laura Eisenberg

**1 PUBLIC FORUM**

There were no requests to speak.

**2 ACTION ITEMS**

- 2.1 Update on Lake Mission Viejo Pilot Project for an Innovative Process for Removal of Constituents of Emerging Concerns for Direct Potable Reuse of Recycled Water

**ACTION:** CONTINUED

Don Bunts, Deputy General Manager, discussed the benefits of the project and explained the project could help in determining future less expensive water treatment options. The Committee requested a cost analysis and funding opportunities be brought to the February WQI Committee meeting for further discussion.

**3 INFORMATION ITEMS**

- 3.1 Update on Arundo Donax Removal in the San Juan Creek Watershed

**ACTION:** INFORMATION ONLY

Laura Eisenberg gave a PowerPoint presentation on the Subregion Habitat Conservation Plan and the invasive Species Control Plan. Ms. Eisenberg stated that RMV is currently using a cut, re-sprout and spray method to remove Arundo, a significant stressor on the riparian habitat, from the San Juan Creek. Ms. Eisenberg noted that 60.91 acres have been removed to date. The committee discussed costs of removal and next steps in the removal process and thanked Ms. Eisenberg for the informative presentation.

3.2 Quarterly Water Quality Report – 2017 Q4 (October 2017 – December 2017)

**ACTION:** INFORMATION ONLY

The Committee discussed the results of the Q4 Water Quality report. Director Olson complimented staff on the new report.

3.3 Report on Water Quality Meeting with County Employees in Esencia

**ACTION:** INFORMATION ONLY

Rich Kisse, Operations Manager, stated that he spoke with Brian Wong, Orange County Health Agency, and Mr. Wong will contact the District when he speaks with home owners and coordinate any sampling with the District. Mr. Kisse also noted that water testing was done at the street and hose bib of Mr. Roger Cummings house and the water tested normal.

3.4 Water Quality and Innovation - Committee Meeting Minutes-Nov 14, 2017 8:30 AM

**ACTION:** INFORMATION ONLY

The Committee requested an AMI/AMR Update be brought to the February WQI Committee meeting.