

**MINUTES OF MEETING NO. 3**  
**State Water Resources Control Board Division of Drinking Water**  
**Advisory Committee for Expert Panel on Direct Potable Reuse**  
**November 10, 2014**

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Chair Garry Brown called to order the third meeting of the Advisory Committee for the Expert Panel on Direct Potable Reuse (DPR), held on behalf of the State Water Resources Control Board Division of Drinking Water (DDW), at 10:00 a.m. on November 10, 2014, in the Visitor Center at Santa Clara Valley Water District's Silicon Valley Advanced Water Purification Center in San Jose, California.

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**Advisory Committee Members Present**

- Garry Brown, Chair, Orange County Coastkeeper
- Randy Barnard, Division of Drinking Water
- Mark Bartson, Division of Drinking Water
- Conner Everts, Environmental Justice Coalition for Water
- Jim Fielder, Santa Clara Valley Water District
- Al Lau, Padre Dam Municipal Water District
- Bruce Macler, U.S. Environmental Protection Agency
- Traci Minamide, City of Los Angeles, Bureau of Sanitation
- Alisa Reinhardt, San Diego Regional Chamber of Commerce
- Keith Solar, San Diego County Taxpayers Association
- Frances Spivy-Weber, California State Water Resources Control Board
- Marsi Steirer, City of San Diego
- Roy Tremblay, County Sanitation Districts of Los Angeles County
- Andria Ventura, Clean Water Action
- Mike Wehner, Orange County Water District

**Advisory Committee Members Absent**

- Charles Mosher, Mariposa County Health Department

**Others Present**

- Hossein Ashktorab, Santa Clara Valley Water District
- Brian Bernados, Division of Drinking Water
- Peter Drekmeier, Tuolumne River Trust
- Jean Debroux, Kennedy/Jenks Consultants
- Edgar Dymally, Metropolitan Water District
- Suzanne Faubl, National Water Research Institute
- Pam John, Santa Clara Valley Water District
- Karen Larsen, Division of Drinking Water
- Marta Lugo, Santa Clara Valley Water District
- Melissa McChesney, Padre Dam Municipal Water District

- Mark Millan, Data Instincts
  - Jeff Mosher, National Water Research Institute
  - Adam Olivieri, DPR Committee Co-Chair
  - Brian Pecson, Trussell Technologies
  - Tom Richardson, RMC
  - Courtney Riddle, City of San Jose
  - Toby Roy, San Diego County Water Authority
  - Dawn Taffler, Kennedy/Jenks Consultants
  - Peter Talbot, Kennedy/Jenks Consultants
  - Melanie Tan, Citizen
  - Sarah Triolo, Trussell Technologies
  - Steve Weisberg, Southern California Coastal Water Research Project
  - Jennifer West, WateReuse California
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## **1. WELCOME AND INTRODUCTIONS**

Garry Brown, the Chair of the Advisory Committee, called the meeting to order.

Jeff Mosher of NWRI opened the meeting with a description of the Advisory Committee, an acknowledgement of the committee members present, and a description of the open meeting requirements, including the use of public comment cards.

Garry Brown invited Jim Fielder of the Santa Clara Valley Water District, and an Advisory Committee member, to provide a welcome. Jim Fielder welcomed the attendees to the District's Silicon Valley Advanced Water Purification Center, a 10-mgd Reverse Osmosis facility, and noted that the plant came online last year.

Hossein Ashktorab of the Santa Clara Valley Water District provided a brief presentation on the Advanced Water Purification Center and talked about current recycled water use in the District.

## **2. REVIEW AND APPROVAL OF MINUTES**

The minutes of the second Advisory Committee Meeting, held on July 11, 2014, was presented to the committee. A motion was made to approve the minutes. The motion was seconded and approved unanimously.

It was noted that Charles Mosher was not present and that he missed the first two meetings as well. Mark Bartson said that the State Water Board is working to arrange for another representative from the health department to participate.

## **3. PUBLIC COMMENTS ON MATTERS NOT ON THE AGENDA**

Garry Brown invited public comments on items not on the agenda. No comments.

#### **4. COMMENTS BY ADVISORY COMMITTEE MEMBERS ON MATTERS NOT ON THE AGENDA**

- Bruce Macler: Are we going to get an update on the State Board’s Recycled Water Research Needs Meeting that was held on October 20, 2014?
  - Jeff Mosher: The State Board held a meeting on recycled water research needs. They enlisted NWRI, WaterReuse Foundation, and SCCWRP to help plan for the meeting. At the meeting four areas were covered: (1) Water quality and health; (2) Performance reliability; (3) Ambient effects of recycled water; and (4) Financial/Socioeconomic issues. About 40 people attended and many were stakeholders in storm water, recycled water, drinking water, and wastewater. Breakout groups were organized and short write-ups on the findings are being developed. A draft will be available within a couple weeks, and then it will be finalized and released as a public document.
- Bruce Macler: Did any major realizations come out of the meeting?
  - Jeff Mosher: There were mostly high level people at the meeting, including general managers. Many of the issues we are thinking about were captured and documented in a way that the state board can use. The idea was to get people talking about these issues, so this meeting was the first step.
  - Steve Weisberg (SCCWRP): The goal of the meeting was a community-building exercise. You had regional boards and state boards interacting. They chose research as a topic because it’s less controversial and it’s important. The performance reliability issue was a high priority. The ambient effects having to do with flow was also big – water rights issues, fish (environmental), stuff people had not been thinking about as much.
  - Marci Steirer: In the general session there was a lot of discussion about research needs, operational needs, and implementation needs. We’ve been focused on the regulations and the treatments, but we need to look at human aspects like certification as well.

#### **5. UPDATE SWRCB DIVISION OF DRINKING WATER CURRENT ACTIVITIES**

Mark Bartson (SWRCB/DDW) provided an update on activities at the State Board. The transition of the drinking water and recycled water program from CDPH to the State Board is moving forward. Upper management is very involved in the process and day-to-day activities. Mark Bartson asked for perspective from field office representatives:

- Randy Barnard: From the field perspective, it’s similar. If we have an issue or problem we send out a request and get help right away. Management is very responsive. Our district offices have a strong local knowledge and good understanding of the issues. Also here is Karen Larsen, DDW Deputy Branch Chief.
  - Karen Larsen: I spent most of my career at the water boards, started at Central Valley and moved to State Board in 2009, worked on TMDLs. I had some

interaction with drinking water stakeholders. I joined the Division in the beginning of August. My experience with the State Water Board will be helpful for DDW. My area is program management. We have a variety of activities in my branch. We just issued the draft of the update to the safe drinking water plan. We are presenting the plan throughout the state at workshops in order to get input. Please download the plan from the website.

- Fran Spivy-Weber: Things are working well. It's been very exciting to pull the two sides of water quality together. All of us at the State Water Board had a health focus but did not talk about it as much. I think there's a lot of synergy between the two and we are seeing opportunities for leveraging, for doing things faster, better, and easier, in a way that is still quite protective. We're at the beginning and there's a lot to do, but everyone is just thrilled with what's happened.
- Randy Barnard: We received comments on the draft Surface Water Augmentation criteria from the expert panel. We are going to address their concerns and resubmit at the beginning of December.
- Mark Bartson: Regarding operator certification, we should look at this, then pick a date for a workshop and bring some operators in and start brainstorming.

Garry Brown asked the public if they had any questions or comments.

- Audience: How will you engage with the public?
  - Randy Barnard: We need to make sure the Expert Panel thinks the plan is feasible. We'll try to mimic what we did with the groundwater recharge.

## **6. BIO-ANALYTICAL TOOLS FOR MONITORING CONSTITUENTS OF EMERGING CONCERN IN RECYCLED WATER**

Steve Weisberg of Southern California Coastal Water Research Project (SCCWRP), which is a research institute focusing on the coastal ecosystems of Southern California from watersheds to the ocean, presented a talk on the use of bioanalytical screening tools for evaluating contaminants of emerging concern (CECs) in water. A printout of his PowerPoint presentation was distributed to the committee. A summary of key points from his talk follows.

- Currently, we cannot measure all CECs in water.
- We don't have the toxicological or epidemiological information on all the individual chemicals.
- It is difficult to evaluate mixtures of chemicals.
- Bioanalytical screening may offer several advantages:
  - Relatively straightforward analytical process.
  - Cost for analytical methods may be reasonable (approximately \$10,000 for capital investment).
  - Regularly used in the pharmacology and food industries, however for very different purposes.
- Use of this method also poses some challenges:

- Most assays have not yet been applied to a water matrix.
- We do not understand the application's sensitivity (i.e., what does the response mean?)
- We do not know how repeatable the results are in the water matrix.
  - Two research teams have started to address this challenge – one in Australia and one with the CA State Water Board.
  - We tried to identify which tests would be most appropriate for the endpoints we are interested in here.
- Although the analytical costs may be reasonable, a program to interpret the results could be difficult and costly.
- We do not have the ability to relate the results to human health.
- The endpoints that the two research groups agreed were important included estrogen receptors, androgens, etc.
  - We tried to evaluate the range of responses from the water tested. And was the response repeatable?
    - There is a trend as the water gets cleaner, but there are differences. The results suggest there is some potential, but there is a long way between potential and application.
    - We have one endpoint that may be ready to go in the near future. The others we did not get to work, due to false positives and other issues.
    - If you want to use this kind of approach, you would need multiple responses.
    - A training program would be needed. Nobody has even started down that path.
- We need an interpretive framework.
  - How do you relate this result to human health?
    - There are two things you need to do right away: move from the “screening” approach to “diagnostic.” However, this will be complicated.
    - Does the screening response relate to the animal response? If you get a hit, then what do you do next? This tells you have a biological response, but you do not know what the chemicals are.
    - We need to develop secondary animals testing that would be paired with this, and we have not started down this road yet.
    - Instead of looking at all the peaks and the standards, it would be detective work to look at unknown peaks.
- Concluding remarks.
  - The technology is in its infancy.
  - There are many questions.
    - How badly do we need this technology?
    - When would we want to start implementing it?
    - We already have a series of barriers. Is it worth the investment?
    - How do we determine when good is good enough?
    - If you put it out too early you can create more confusion.

### Advisory Panel Comments and Questions:

- Fran Spivy-Weber: Are you using any of the information being gathered on CECs?
  - Steve Weisberg: There's a separate project going on right now to figure out which chemicals to monitor based on pervasiveness of the chemical in the environment and the likelihood of toxic response. They are gathering data to determine a list of chemicals to use.
- Adam Olivieri: You talk about sample enrichment. Are you talking about collecting thousands of gallons of water?
  - Steve Weisberg: That's the question. We need to make the cell line relevant enough. In some cases you would have to concentrate the sample so much that we cannot do it.
- Andria Ventura: I am intrigued by "how good is good enough?" You may have trace levels of something that may not pose a threat to human or environmental health. Pharmaceuticals are a good example because they are continually added to the waste system. What are those very low dose impacts? Are they being looked at over a lifetime?
  - Steve Weisberg: This is a short-term test. If you get a cell line that is sensitive enough, you can pick up a lot of effects.
- Mike Wehner: What is USEPA doing at the federal level?
  - Bruce Macler: The recent IRIS discussion on hexavalent chromium focused on *in vivo* versus *in vitro* assays. I am not saying our agency will go away from using those, but will consider what they mean in the larger context. But you should do *in vivo*—it doesn't mean anything otherwise. From a risk manager's standpoint, we may not have a risk management question where this tool is useful. So, I do not know where that is going to play out but we might follow developments related to hexavalent chromium to see where this goes.
  - Steve Weisberg: I deal more on the ambient side. How is this going to be received? Will it be useful? The question is not necessarily can we do the science, but can we do the *in vivo* testing and the non-targeted chemical analysis.
- Audience Member (Adam Olivieri [DPR Expert Panel Member]): Regarding your last bullet on your last slide about the DPR panel: several members of the CDC panel are also on the DPR panel. We will take up this issue, but we will look at it more broadly from a human health perspective. Is it limited to one receptor? You have to be a little cautious about jumping in and saying this is going to solve the world's problems.
- Ray Tremblay: How does this work in terms of sensitivity? For this type of project, we are looking at full advanced treatment. Not much was detected, correct?
  - Steve Weisberg: Yes. It may just be a way of validating that the surrogates are working. This provides an alternative.
- Mark Bartson: Looking at the results of the bioassay testing in your presentation (slide 12), is that untreated surface water from a stream?
  - Jeff Mosher: This is not typical. When you hit drinking water with chlorine, you get byproducts. These byproducts will show bioactivity. In addition, it is not clear if the chlorine was ever removed, which would interfere with this test.

- Audience Member: You said you think a lot of questions are at the interface at science and policy. But, we cannot say what this means for human health. To what degree should California be leading the way with these studies?
  - Steve Weisberg: We have studies on estradiol and human health, so that's what we can look at to help determine sensitivity. Should California be the test ground for these tests? That's a question for you all.
- Mark Bartson: There are seven relevant cell assays. How many do you need?
  - Steve Weisberg: This goes back to "How good is good enough?" Are three adequate? It depends on how you are using it. Are you using it to better understand your system, or are you replacing the chemistry you are doing now?
- Andria Ventura: Looking at the endpoints you have, you said we have technology. Do you anticipate that there would be other endpoints that we need to consider down the line, but that no technology yet exists?
  - Steve Weisberg: Absolutely. The project by the State Water Board was looking at tests for which we already have technology. The WateReuse Research Foundation project looked farther down the line.
- Garry Brown: What was the second endpoint?
  - Steve Weisberg: Progesterone receptor.

## 7. PRESENTATION ON DPR PUBLIC OUTREACH EFFORTS

Mark Millan from Data Instincts spoke about DPR Public Outreach Efforts. A printout of his PowerPoint presentation was distributed to the committee. A summary of key points from his talk follows.

- This project includes three phases. We just completed Phase I on developing strategic communication plans, and now we are starting on Phase II.
- Australia has spent millions of dollars developing videos and educating their people about IPR and desalination projects. They were very concerned about public acceptance and engagement. We tried to learn from the Australians' experiences.
- Throughout all we've been doing, our methodology is to listen, learn and retool.
  - We conducted research on any campaigns related to DPR.
  - We spoke with legislators and learned about their perspectives, and we talked to health professionals and special interest groups.
  - We held focus groups in two model communities (San Diego and Santa Clara) that reflected the demographics of all of California.
  - We also conducted telephone surveys.
    - All of this information has been rolled up into a communications plan to be used at both the state level and the community level.
    - We mean *any* community because this isn't just for California: We heard from Texas and Arizona, which are also going through a severe drought.

- The reports from this work are currently being reviewed by an editor at the foundation and they will be available publicly in the near future.
- How can we make materials generically viable for other communities?
  - In the first quarter of 2015 we will create communication toolkits for communities that are exploring these other options. We will begin working in California.
  - We need to educate multiple audiences about IPR and DPR, and each audience will need a different interface. We cannot serve everyone with one plan.
  - After we disseminate this information we will measure our effectiveness in those communities.
- The greatest challenge the agencies faced was addressing safety issues for human health.
  - How do we deal with the “yuck factor?”
  - How do we build trust? We need to bring our regulators along with us.
  - The utilities are sending mixed messages.
  - Dealing with the legislators can be difficult.
    - Legislators thought they knew what we were talking about, but they confused greywater with DPR. They need to have a summary or “one-sheet” explaining the technology for when they speak to constituents.
- Special interest groups displayed a mixed response.
  - Some environmental groups like DPR because they don’t like other new supply options, like desalination, that are energy-intensive and may affect aquatic life.
  - Other groups do not trust government to do a good job, to be safe, to execute plans properly, and to offer brine disposal. They want assurance that we are paying attention to these issues.
- Findings from focus group studies and telephone surveys.
  - Held in April 2014 in San Diego and Santa Clara County, with diverse groups. Anyone who knew anything about recycled water was dismissed. We slowly moved people into a discussion about water. With the drought on, people had opinions. We showed them the differences between IPR and DPR using simple graphics, and we shared the existing facts sheets. Finally, we showed a 2.5 minute animated video created by the foundation.
  - We also did telephone surveys—600 in each market, both cell phone and landlines, in Spanish and English, representing a mix of economic classes, selected from registered voters.
  - The majority supported IPR, and their reason was the drought/water shortage/limited clean water. They had just learned about this alternative supply.
  - There was slightly less support for DPR.
  - Interestingly, if you introduce DPR FIRST, then the support is slightly higher than if you introduce IPR first, so these findings may affect how you roll this out.
  - Next highest support was for conservation/good use of resources.
- Safety concerns were the main reason for opposition. Those opposed to DPR said:
  - Don’t trust the filtering process.
  - It will be unhealthy to drink this water.
  - The process could be unintentionally corrupted.

- Don't trust the water district.
- Water might be contaminated.
- Water could taste bad.
- Those who drink unfiltered tap water are more accepting of DPR than those who drink bottled water.
- Voters who were initially opposed to DPR quickly become more comfortable with it after they received information about safety.
- Adding messaging in particular areas can change people's minds. Those of us who study this carefully see the areas where we can enhance people's thinking.
- We are not selling DPR. We want to be responsible about delivering safe water to communities.
- Consistent supporters 38%. Consistent opponents 32%. Swing 31%.
  - Supporters were younger, college educated, Democrats, high income, use only a cell phone.
  - Opponents were not educated, Republican, interviewed in Spanish.
- "Advanced purified water" was the name that received the most support. When we asked people if they would be comfortable using water treated with reverse osmosis and advanced oxidation, over 60% said yes, even though these people didn't know what those words meant.
- When you talk about familiar concepts, such as "we recycle glass and yard waste," and then say "now we recycle water," it advances the idea that this is the right thing to do.
- Messages about supporting the environment and animal species resonate with the public.
- Does the technological process echo the natural process? This also resonates with people.
- Three in five voters found additional messaging compelling. We found that this messaging helps people understand the process. This isn't just one process. There is a spectrum – it's about getting people to be more accepting of the process of water reuse.
- Who should deliver the message?
  - The new water department would be great spokespeople, but we understand their neutrality.
  - Medical doctors, scientists, EPA.
- Who should not deliver the message?
  - Politicians.
- Key messages:
  - Potable reuse provides a safe, reliable and sustainable drinking water supply.
  - It's good for the environment.
  - Provides a locally controlled, drought-proof water supply.

*Advisory Panel Comments and Questions:*

- Garry Brown: Is this the first of this research to establish a baseline for public opinion? Are you going to try to keep a similar format? In this data, how much did you talk about cost of desalination compared with reuse and imported water?

- Mike Millan: Fourteen years ago the foundation did a study, but this is the most recent of any study in any country. We'd like to keep a similar format with the two groups. As long as the foundation continues funding this work we can expand the learning. We are taking what we learned and providing it to other communities. There was little discussion of costs.
- Andria Ventura: We go into communities and knock on doors to do education on water issues. We do hear people talk about the ocean and desalination in relation to the drought. At some point we may need to do some more education. I understand why you would do outreach in SD and Santa Clara, but we see the worst water quality in areas like the Central Valley that cannot do this work because they don't have the resources. Is there an idea to expand into these areas, where there will be a lot of distrust of DPR?
  - Mark Millan: Water ReUse is going to share this information with everybody.
  - Jeff Mosher: This issue came up at our October meeting - the capacity of agencies to pull this off – technical, managerial, financial (TMF). It's a concern for the regulators.
- Bruce Macler: Some demographics will consistently be opposed. It's important to know where people are coming from before meeting with them. Can we go out to talk to the Latinos and educate them? The more you educate people, the more accepting they are. If you do this again in a few years, will you have a population-wide change in thinking?
  - Mike Millan: I think we will, just like we have with recycling of other items. Right now these communities are not recycling any water. They could start with irrigation of golf courses and go from there. Those considering DPR, like San Diego, people are not always ready to hear the information until they are ready. In Australia, it took seven years of drought to build three desalination plants and the DPR plant. It was a mess. We can't make that mistake in California. We have to get it right, we have to work together, and not against each other.
- Mark Bartson: In the Central Valley we are rolling out lots of solutions for nitrate. The same type of approach might help us succeed with this effort. If a treatment system goes in and people don't trust it, you have not really done your job.
- Mike Wehner: Trust is the biggest factor. You have to win trust with your community. Gender differences can matter a lot. I think the Hispanic/English challenge is big. I'm not going to say one gender is stronger than another.
- Marsi Steirer: Over the years, there has been a difference between men and women. Women make the food and feed the kids, and are focused on being the caregiver, and are concerned about the safety of the family.
- Jim Fiedler: We have a very educated public, but last week a card went out and said "This board member wants you to drink toilet water." This reminds people not to vote for this person. So this is still a scare tactic that will be used in the future.
- Audience: Does polling done in Orange County show greater acceptance?
  - Mark Millan: Yes, the most recent survey shows greater acceptance in the community.
  - Mike Wehner: But remember, there's a lot of self-selection in the survey participation. Think about this past election cycle.

- Mark Millan: True, but we don't just do phone calls. We have in-community discussions using iPads, which take more time. You cannot rely only on phone calls. I think these results echo what we've heard from other agencies.
- Audience: We always come back to the fundamentals of potable reuse. Most of the public does not grasp the difference between indirect and direct. And I look at the communities that we are going to be moving into, and there are opportunities to do this work. As you develop these messages, how do you fashion the message to fit the community?
  - Mark Millan: There isn't one message from everyone. Work in concentric circles during the phasing of the projects. Sometimes people want to do everything, run TV and radio ads. Don't do it. You need to bring a series of stakeholder groups along with you, and get them up to speed. As I said earlier, we're not selling DPR. It's a spectrum of potable reuse that is the new chapter of water recycling. In the not too distant future it won't be an issue, and young people understand this; 20 years ago I had a difficult time getting recycled water on lawns in Redmond City.
- Andria Ventura: Who is delivering the message? Me going out there and talking to people in a different cultural and economic world than I am is not useful. If we are trying to get these messages out there, we need to partner with community organizations and people who understand the cultural use of the language. It's not just the outreach that the water district does. It needs to come from the right person so that people really buy it.
  - Mike Wehner: We got positive coverage early on. The NYT and National Geographic published positive stories and everyone wanted to talk to us.
  - Garry Brown: What has made the difference is when the regulators, businesses, and the environmental community stand on stage together and say "this is what we should do." That's a lesson going forward.
    - Mark Millan: San Diego and Santa Clara would agree.

## **8. LUNCH BREAK AND TOUR OF THE SILICON VALLEY ADVANCED WATER PURIFICATION CENTER**

## **9. UPDATE AND REVIEW OF EXPERT PANEL ACTIVITIES AND DISCUSSION AND COMMENTS FOR EXPERT PANEL**

Jeff Mosher of NWRI presented an update on the Expert Panel's activities. A printout of his PowerPoint presentation was distributed to the committee. A summary of key points from his talk follows.

The panel had some comments on DPR but most of the meeting focused on surface water augmentation. Timeframe for the panel is 2013-2016, and they are charged with three tasks:

- (a) Assess which, if any, additional areas of research are needed for establishing criteria for DPR. The information we pulled together went to WaterReuse and they are using that information for research planning. The Foundation will provide an update at each meeting of the expert panel.

(b) Advise DDW on public health issues and scientific and technical matters regarding the development of surface water augmentation (IPR) criteria. We will look at this at the next meeting.

(c) Advise DDW on public health issues and scientific and technical matters regarding the feasibility of developing criteria for DPR.

DPR Timeline: the Advisory Panel meets in advance of the Expert Panel, and the Expert Panel takes their comments into consideration. There are three legislated dates: (1) draft expert panel DPR report, (2) final report on DPR Feasibility in 2016-17, and (3) criteria for surface water augmentation. A lot of the research is informing us on how the projects will be implemented. The real benefactors of this work are the agencies that will be implementing changes.

The Expert Panel Members are:

- *Co-Chair:* Jim Crook, Ph.D., P.E., Independent Consultant (Boston, MA)
- *Co-Chair:* Adam Olivieri, Dr.P.H., P.E., EOA, Inc. (Oakland, CA)
- Michael Anderson, Ph.D., University of California, Riverside (Riverside, CA)
- Richard Bull, Ph.D., MoBull Consulting (Richland, WA)
- Jörg E. Drewes, Ph.D., Technische Universität München (Munich, Germany)
- Charles Haas, Ph.D., Drexel University (Philadelphia, PA)
- Walter Jakubowski, M.S., WaltJay Consulting (Spokane, WA)
- Perry McCarty, Sc.D., Stanford University (Stanford, CA)
- Kara Nelson, Ph.D., University of California, Berkeley (Berkeley, CA)
- Joan B. Rose, Ph.D., Michigan State University (East Lansing, MI)
- David Sedlak, Ph.D., University of California, Berkeley (Berkeley, CA)
- Tim Wade, Ph.D., United States Environmental Protection Agency (Durham, NC)

The Second Panel Meeting was held July 24-25, 2014, at Orange County Water District in Fountain Valley.

- Focused on reviewing state mandate and the panel's charge.
- First report was on the panel's initial discussions on the draft Surface Water Augmentation (SWA) IPR Preliminary California Regulation Concept, prepared by DDW and dated July 2014.
- Responded to comments made by the DDW Advisory Committee at the second meeting.

The Panel's comments on DPR during the Second Meeting included:

- US EPA and Association of State Drinking Water Administrators (ASDWA) are interested in DPR.
- Mandate/Tasks: Who defines what is adequately protective of public health?
- Statutory Mandate/Panel tasks: What is the definition of Recycled Water? We need to clarify the differences between planned, unplanned, and *de facto* reuse and identify gaps between the Safe Drinking Water Act and Clean Water Act.

- WRRF DPR Research Initiative: How will WRRF interface with the Panel? How will WRRF apply results of research? Comments included:
  - Consider designing a health effects surveillance study. Apply translational science/designing DPR with a systems approach.
  - Wastewater treatment plants are changing. Will we be pulling nutrients out?
  - Potable reuse is going to change as the treatment facilities evolve.
  - Would DDW consider different evaluation processes for (1) “Direct Direct” or (2) Direct followed by a surface water treatment plant?
    - DDW said it could be possible to develop two sets of regulations. The main concern is failure of the operation. Operators must be able to respond to a failure very quickly.
    - Mechanisms are needed to deal with treatment failure. We can use surrogates instead of real-time pathogen monitoring.
  - How do we determine if treatment and monitoring is sufficient to make DPR feasible?
  - It will be challenging to determine if DPR would directly contribute to infectious disease in communities.
    - How can we ensure that treatment processes will minimize the risk of exposing the public to low doses of chemicals and disease?

*Advisory Panel and Audience Comments and Questions:*

- Audience question: What would a public health surveillance plan look like?
  - Audience response: Process criteria should be based on redundancy and reliability, using specific numbers. Criteria for DPR will be the same as for IPR for individual chemicals. Suggest using a threshold of toxicological concern. Science-based tools can be used to screen chemicals.
- Audience question: For these regulations, what is the range of projects that the Panel will be considering? Who will manage multiple barriers in a treatment system? Who will run the treatment plants?
- Mark Bartson: Are you talking about how the sewershed is managed?
  - Jeff Mosher: Some areas have a non-reclaimable line, like a brine line. Industries may have a permit to discharge a particular contaminant like dioxane. As part of a source control program you would manage what chemicals can go in. Residential wastewater is harder to control because individual houses are not permitted.
- Audience questions: What is the response and the policy for failures? What is the action plan? If there is a lapse there must be an approach to address this.
  - Jeff Mosher: Do not use terms like failsafe and infallible. “Fault tolerant” is better.

Future Panel Meetings

- **Next meeting of the Expert Panel will be December 11-12, 2014, in San Diego, CA, and will be hosted by City of San Diego.**

- Surface water augmentation has been proposed by San Diego. The panel wants to learn what San Diego has done in modeling, and from a policy point of view.
- City staff and the consultant who does the modeling will speak to the panel.
- We will build in some time to talk about DPR, but it won't dominate discussion.
- **The second meeting will be March 11-12, 2015, in Richmond, CA, and will be hosted by the San Francisco Estuary Institute.**
  - Advisory Committee must meet in advance of this meeting.
  - Advisory Committee members are welcome to attend expert panel meetings.

*Advisory Panel and Audience Comments and Questions:*

- Marsi Steirer: It would be beneficial if we have an understanding of the research being done and the timeline of when information will be available. The next 15 months are going to be critical. I think that a refined time line will be important so that we know when key pieces of data will be available.
  - Jeff Mosher: We can schedule the next meeting of the advisory committee, but you're asking what would be on their agenda. You're saying there's nothing on the agenda now and I agree with you.
- Garry Brown: Didn't the expert panel ask how the research coming out of the Water ReUse foundation is going to be used?
  - Jeff Mosher: This has come up with the panel and WRRF. The goal of the initiative was to provide information to the expert panel so that they could advise the state on topics such as critical control points and operator training before these things are implemented. We could have presentations on these two topics, but they are not far enough along on the operator training at this point. We are talking with the state about what the agenda is going to look like. In December we will spend time on surface water augmentation, and by March we expect they will have a completely rewritten criteria for the panel to review.
  - Adam Olivieri: We will try to plug gaps in the data as soon as possible, but the idea is to get surface water augmentation done first.
- Bruce Macler: For our next meeting can we get updates from Hazen and Sawyer?
  - Jeff Mosher: They can tell you what they're doing, but they can't tell you the results yet.
- Garry Brown: The WaterReuse Research Foundation (WRRF) raises money from organizations to fund this science. The panel here is the state-recognized panel.
  - Jeff Mosher: If one of the projects is published, WRRF provides that to us, and we make it available to the panel. Doug Owen has presented at the panel meeting. The panel is less interested in peer review than in how the results will affect implementation of DPR.
- Andria Ventura: I'd like to see the list of questions the expert panel is addressing. I know what they are supposed to be focused on, but we don't know exactly what they are working on.
- Fran Spivy-Weber: Is the expert panel looking at gradations of DPR? We talked about "Direct Direct" and sending water through a treatment plant. Are they looking at

alternatives and costs? Are there things we could do now while we are figuring out what to do?

- Adam Olivieri: Remember, you must determine how to achieve the endpoint. You are producing the raw source water for potable reuse. We talk about reliability and redundancy, not cost.
  - Jeff Mosher: Criteria will begin with source control, not just removal of pathogens and meeting of MCLs. A response plan will be part of the criteria.
- Marsi Steirer: My staff wanted me to bring this forward. Earlier this morning we heard Mark talk about terminology associated with a DPR presentation that he made on outreach, and Jeff indicated that the expert panel was looking for a definition for recycled water. Our terms are all over the place. The name of our group is the Advisory Committee on Direct Potable Reuse of Recycled Water. We are all saying the same thing but calling it by different names. Is there a way for the Advisory Committee to interface with the expert panel to decide on what to call this? This would benefit the state.
  - Jeff Mosher: Do you think there should be an ad hoc committee?
  - Fran Spivy-Weber: I would suggest someone from the clean water side as well as the drinking water side. How do we move from a waste discharge issue to a safe drinking water issue?

**ACTION ITEM: Form an Ad Hoc Committee on Terminology: Marsi Steirer, Al Lau, Keith Solar, and Garry Brown.**

**ACTION ITEM: Form an Ad Hoc Committee on Operator Training: Traci Minamide, Bruce Macler, Mike Wehner, Jim Fiedler, and Karen Larsen.**

- Jeff Mosher: Is there any additional other feedback you want to give to Adam and his crew?
- Marsi Steirer: How does the presentation Steve made earlier relate to us and the expert panel? Are they getting the same presentation that we had?
  - Jeff Mosher: Not in December, but bioassays is on the radar. If there is specific input from this committee, then we can send that to them.
- Marsi Steirer: It wasn't clear to me from Steve's presentation what the objective was for moving forward with that kind of bioanalytical tool. Why would we pursue this?
  - Steve Weisberg: Right now you have a lot of unknown chemicals in the system. If you fear those unknowns, that's a question for you all. In retrospect, you need to figure out how to use it. It could replace using chemistry. At the other end of the spectrum, you could use it to learn something about your source water. You could use it as a supplement to figure out which chemicals you should be focusing on.
  - Jeff Mosher: Shane Snyder gave a great presentation at the WateReuse symposium. Folks that are running treatment systems have no idea how to implement this. There's no training, no guidance, and we have no idea how to implement it. My concern is that if we had a regulatory framework that included bioassays, it would be very difficult to implement. The Expert Panel could help determine how to move forward.
    - Bruce Macler: After 9/11 there was interest in developing analytical devices to track what is in water using all kinds of systems, including bioassays. But I

can't see this as part of an operational plan. If folks thought that was important, like a make-or-break, they'd have to invest in it.

- Andria Ventura: When the expert panel looks at feasibility, how are they going to balance the tensions between using water for potable reuse and putting it back into the environment to support the ecosystem and our waterways? I'd love to hear more about that at some point.
  - Bruce Macler: Can that be a 10-minute agenda item and so that we can learn more about the issues?
    - Jeff Mosher: We can definitely schedule something for next time, but I'm not sure it's in the purview of the expert panel. This is more of a policy/feasibility issue.

## **11. REVIEW EXCEL TABLE OF EXPERT PANEL RESPONSES TO QUESTIONS AND COMMENTS FROM DPR ADVISORY COMMITTEE MEETING**

No comments or questions regarding this document.

**Next meeting will be Friday, February 20, 2015, hosted by the City of San Diego.**

For the last meeting we formed a subcommittee to develop the next agenda. We will put out a call for anyone interested to join in creating the agenda.

## **12. ADJOURN**

The meeting was adjourned at 2:45 pm.