



Memorandum

Date: January 20, 2022

To: Jing Chao, PE, State Water Board Division of Drinking Water

From: Adam Olivieri, DrPH, PE, Expert Panel Co-Chair
James Crook, PhD, PE, Expert Panel Co-Chair

Subject: Summary of Meeting 2 of the Direct Potable Reuse Criteria Expert Panel

The National Water Research Institute (NWRI) is pleased to present the proceedings of Meeting 2 of the Expert Panel (Panel) on Direct Potable Reuse Criteria. NWRI convened and facilitated the meeting online on December 1, 2021. See **Appendix A** for more information about NWRI.

This memorandum summarizes the meeting proceedings. Additional information including the review materials, agenda, and links to the video recording and the slide presentations are referenced in this summary.

Panel Charge

The Panel charge for this project is to review proposed direct potable reuse (DPR) criteria and adopt a finding as to whether, in the Panel's expert opinion, the proposed criteria would adequately protect public health (see California Water Code §13561.2).¹

Meeting 2 Objectives

- Present the Panel's status on their review of the draft DPR criteria.
- View presentations by State Water Board Division of Drinking Water (DDW) staff.

¹ California Water Code §13561.2 says that before December 31, 2023, the state board shall adopt uniform water recycling criteria for direct potable reuse
https://leginfo.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT§ionNum=13561.2



- Provide time for public questions to DDW.

See **Appendix B** for the full meeting agenda and **Appendix C** for panel members and expertise. See **Appendix D** for links to the Meeting 2 video recording and slide presentations. **Appendix E** includes a list of meeting participants.

Meeting 2 Summary

Meeting 2 presentations and discussion were as follows:

- 1. Welcome, Introductions, Review Agenda. Presented by Kevin Hardy, MPA, JD, NWRI Executive Director.**
- 2. Co-Chairs Welcome, Schedule, and Summary of Panel Key Comments. Presented by Panel Co-Chairs James Crook, PhD, PE, and Adam Olivieri, DrPH, PE.**
- 3. Addressing RWA and TWA in the DPR Criteria, \$64669.45 and \$64669.50, presented by Bob Hultquist, PE.**

Summary of Panel's preliminary discussion:

A Panel member asked if the draft criteria consider dilution for microbes differently than for chemicals. DDW staff noted that the draft criteria do not directly acknowledge that blending can be used for microbial log reduction (LR) credits and that consideration of such a request would be on a case-by-case basis as an LR alternative.

- 4. Pathogen Treatment Alternatives in the DPR Criteria, presented by Bob Hultquist, PE.**

Summary of Panel's preliminary discussion:

The Panel asked why there are three treatment mechanisms rather than any other number. DDW responded that they believe the three treatment mechanisms are reliable and well-understood based on the DDW experience with indirect potable reuse projects. While the list of treatment mechanisms is limited to three, the DDW intent is not to limit the number of mechanisms that it will consider in the future. DDW staff are open to any advice from the Panel on how to define and expand the list to include other mechanisms.

- 5. Drinking Water Distribution System Requirements, presented by Jing Chao, PE.**

Summary of Panel's preliminary discussion:

The Panel asked about the rationale on corrosion control for medium and small systems and wanted to know why testing is limited in smaller systems. DDW responded that their program is based on



the EPA's lead and copper rule. EPA regulations take capability and economics/cost into account, and smaller utilities might have limited testing capability and budget. As part of DDW's review of the project plans, DDW will require operators of smaller systems to do a study if DDW believes a problem might occur. Small systems also need to have a corrosion control and stabilization program; they have to disclose any issues to DDW and may be required to do sampling and testing.

The Panel asked if there is blending between DPR-treated water and a second source water, then what is in the regulations to require utilities to check chemical compatibility for the various blending ratios. DDW responded that per regulations both water sources must be stabilized, and DDW would require a study if potential issues are noted in the project engineering report.

The Panel asked if DDW should address temperature in the distribution regulations, as temperature might impact water quality chemistry that could affect water treatment as well as cause aesthetic issues. DDW responded that potential temperature-related concerns would be identified as part of the project engineering report, and any additional effort would be required by DDW as part of their review of the project report.

Other Panel Questions and Discussion

The Panel asked if there is anything new on the horizon for legionella monitoring. DDW responded that no plans for monitoring are being considered.

The Panel asked about public notification, in section 64669.125. This section talks about notification requirements but there is no timeline. The Panel questioned whether DDW should add timelines to make sure that notification is timely. DDW responded that they use the same timelines that are in existing regulations (see Title 22, Division 4, Chapter 15, Article 18).

6. Public Comments

Public comments received included the following:

- DDW's approach to address corrosion and water stability seems appropriate.
- Smaller communities may not have access to AWT05 level operators.

WaterReuse California Comments:

- Raw water augmentation (RWA) has benefits beyond those presented by DDW staff and thus supporting the need to include RWA in regulations.
- There is concern that the results of the DPR-1 and -2 research projects were not fully considered as part of developing LRVs.



- The alternative clause should not be narrow and should more closely mirror the groundwater alternative clause, which would allow for a broader, more elastic clause to address any future questions/projects.

Next Steps

Panel Meetings 3 and 4 are scheduled for January 26 and February 28, 2022, respectively. Both will take place online.



Appendix A • About NWRI

About NWRI

A 501c3 nonprofit organization, National Water Research Institute (NWRI) was founded in 1991 by a group of California water agencies in partnership with the Joan Irvine Smith and Athalie R. Clarke Foundation to promote the protection, maintenance, and restoration of water supplies and to protect public health and improve the environment. NWRI's member agencies include Inland Empire Utilities Agency, Irvine Ranch Water District, Los Angeles Department of Water and Power, Orange County Sanitation District, Orange County Water District, and West Basin Municipal Water District.

For more information, please contact:

National Water Research Institute
18700 Ward Street
Fountain Valley, California 92708 USA
www.nwri-usa.org
Kevin Hardy, Executive Director
Suzanne Sharkey, Project Manager
Mary Collins, Communications Manager

Disclaimer

This memorandum was prepared by an Expert Panel, which is administered by National Water Research Institute. Any opinions, findings, conclusions, or recommendations expressed in this report were prepared by the Panel. This report was published for informational purposes.



Appendix B • Agenda



Direct Potable Reuse (DPR) Criteria Expert Panel (AB 574)

December 1, 2021

Virtual Meeting Access

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/dpr-criteria-panel.html

Contacts

Suzanne Sharkey: (949) 258.2093

Mary Collins: (206) 380.1930

Kevin Hardy: (760) 801.9111

Meeting Objectives

- Present the Panel’s status on their review of the draft DPR criteria.
- Presentations from DDW staff on DPR criteria.
- Provide time for public comments.

Wednesday, December 1, 2021

10:00 a.m.	Welcome, Introductions, Review Agenda, Overview of Panel Process	Kevin M. Hardy, NWRI
10:10 a.m.	Panel Report-Out	Adam Olivieri and Jim Crook, Panel Co-Chairs
10:40 a.m.	DDW Presentations on DPR Criteria Topics	DDW staff



11:30 a.m. Public Comment Session

Facilitated by Kevin M. Hardy

12:00 noon Adjourn

Meeting Invitees

Panel Members

- Co-Chair: James Crook, PhD, PE, Engineering Consultant
- Co-Chair: Adam Olivieri, DrPH, PE, EOA, Inc.
- Richard Bull, PhD, Washington State University (Emeritus)
- Jörg E. Drewes, PhD, Technical University of Munich
- Charles Gerba, PhD, University of Arizona
- Charles Haas, PhD, Drexel University
- Amy Pruden, PhD, Virginia Tech
- Joan Rose, PhD, Michigan State University
- Shane Snyder, PhD, Nanyang Technological University
- Jacqueline E. Taylor, REHS, MPA, Los Angeles County Department of Public Health (Retired)
- George Tchobanoglous, PhD, PE, University of California, Davis (Emeritus)
- Michael P. Wehner, MPA, Orange County Water District (Retired)

State Water Resources Control Board

- Ginachi Amah, PE, Chief, Recycled Water Unit, DDW
- Randy Barnard, PE, Chief, Technical Operations Section, DDW
- Brian Bernados, PE, Technical Specialist, TOS, DDW
- Steve Book, PhD, Research Scientist, DDW (ret)
- Robert Brownwood, PE, Chief, Program Management Branch, DDW
- Jing Chao, PE, Technical Specialist, TOS, DDW
- Bob Hultquist, PE, Principal Engineer, DDW (ret)
- Sherly Rosilela, PE, Technical Specialist, TOS, DDW
- Saeed Hafeznezami, PhD, PE, Technical Specialist, Drinking Water Field Operations Branch
- Kurt Souza, PE, Asst. Deputy Director, Chief, Drinking Water Field Operations Branch
- Dave Spath, PhD, Principal Engineer, DDW (ret)

National Water Research Institute

- Kevin M. Hardy, Executive Director



DPR Criteria Panel: Meeting 2 Proceedings Summary

- Suzanne Sharkey, Project Manager
- Mary C. Collins, Communication Manager
- Natalie Roberts, Project Assistant



Appendix C • Panel Members and Expertise

Brief professional biographies of the Panel members are available on the DDW web site at:

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/direct_potable_reuse/ab574panelroster.pdf

- Co-Chair James Crook, PhD, PE (Environmental Engineering Consultant)
- Co-Chair Adam Olivieri, DrPH, PE (EOA, Inc.)
- Richard Bull, PhD (Washington State University - Emeritus)
- Jörg E. Drewes, PhD (Technical Univ of Munich)
- Charles Gerba, PhD (University of Arizona)
- Charles Haas, PhD (Drexel University)
- Amy Pruden, PhD (Virginia Tech)
- Joan Rose, PhD (Michigan State University)
- Shane Snyder, PhD (Nanyang Technological University)
- Jacqueline E. Taylor, REHS, MPA (LA County Department of Public Health - Retired)
- George Tchobanoglous, PhD, PE (University of California, Davis - Emeritus)
- Michael P. Wehner, MPA (Orange County Water District - Retired)

Panel Expertise

Microbial Risk Assessment, Chemistry, Microbiology, Water Treatment Engineering, Wastewater Treatment Engineering, Toxicology, Multi-barrier System Reliability, Public Health, Potable Reuse Operations, and Water Recycling Regulations



Appendix D • Links to Meeting 2 Video and Slides and Publicly Available Review Materials

Meeting 2 Recording

<https://www.youtube.com/embed/rLLgLghvf9w?modestbranding=1&rel=0&autoplay=1>

Presentations in Order of Agenda

NWRI Introduction and Expert Panel Co-Chairs' Welcome

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/docs/2021/epmtg2_nwriepslices.pdf

DPR Criteria Expert Panel Meeting 2. Addressing RWA and TWA in the DPR Criteria; Pathogen Treatment Alternatives in the DPR Criteria; Drinking Water Distribution System Requirements

https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/docs/2021/epmtg2_ddwslides.pdf



Appendix E • GoToMeeting Attendees

Meeting Participants

Panel Members

- Co-Chair James Crook, PhD, PE (Environmental Engineering Consultant)
- Co-Chair Adam Olivieri, DrPH, PE (EOA, Inc.)
- Richard Bull, PhD (Washington State University - Emeritus)
- Jörg E. Drewes, PhD (Technical Univ of Munich)
- Charles Gerba, PhD (University of Arizona)
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- George Tchobanoglous, PhD, PE (University of California, Davis - Emeritus)
- Michael P. Wehner, MPA (Orange County Water District - Retired)

State Water Board Staff

- Mir Ali
- Ginachi Amah
- Faraz Asad
- Randy Barnard
- Brian Bernados
- Bob Holtquist
- Robert Brownwood
- Jing Chao
- Dave Spath
- Candida Granillo-Dodds



DPR Criteria Panel: Meeting 2 Proceedings Summary

- Saeedreza Hafeznezami
- Ileana Wald
- Jorg Drewes
- Scott Miller
- Aide Ortiz
- Sherly Rosilela
- Kurt Souza

NWRI Staff

- Mary Collins
- Kevin Hardy
- Suzanne Sharkey