GWPC ASR-MAR WORKGROUP OVERVIEW

2022 Salt Lake City Annual Forum | June 22, 2022

GROUNDWATER PROTECTION COUNCIL

ASR-MAR WORKGROUP

GWPC & ASR-MAR Workgroup

- About GWPC
- About the ASR-MAR Workgroup
  - Est. September 2019 - formed to examine, discuss, and make recommendations on ASR & MAR issues/topics
  - Serves a forum for all stakeholders to exchange information and to collaborate on efforts concerning ASR and MAR issues or topics.
  - Not limited in scope to UIC.
  - Three Co-Chairs guide the Workgroup activities

ASR-MAR WORKGROUP

ABOUT THE WORKGROUP

- Formed in 2019
- Serves as a forum for Federal, State, Tribal, and local government, organizations and public interest, and professional organizations to exchange information, views, and ideas, and to communicate and collaborate on efforts concerning ASR and MAR issues or topics. Its efforts are not limited in scope to just UIC issues.
- Identified by US EPA National Water Reuse Action Plan as a leader (Action 7.4) to increase understanding of current aquifer storage & recovery practices.

ASR-MAR WORKGROUP

ASR – MAR: OPPORTUNITIES & CHALLENGES

- Opportunity:
  - Increasing demands for water supply solutions urgent in many regions of the country
  - Declining groundwater levels in aquifers
  - Storing excess water resources underground to use at a later date OR to manage water quality of aquifer can be solution
- Challenges:
  - Water quality (example: stormwater – variable quality)
  - Regulatory framework may be complicated by some states' water rights requirements
  - Financial and scientific challenges

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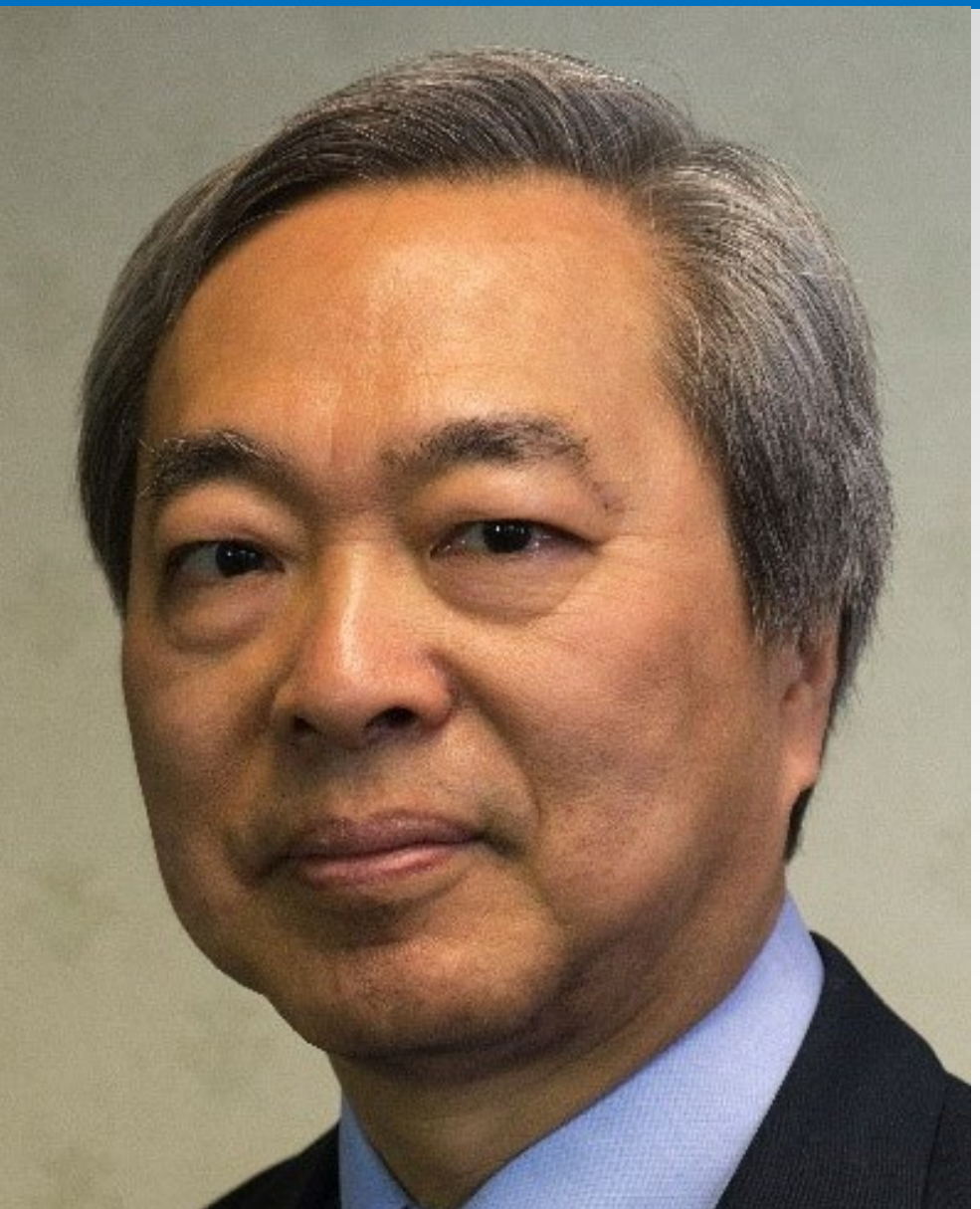
WATER REUSE ACTION PLAN

- WRAP:
  - Recognizes that there are differences in how aquifer recharge is described, implemented and managed.
  - Seeks to better understand the range of aquifer storage and recovery practices and corresponding efforts to ensure the protection and sustainability of groundwater resources.
- The GWPC Workgroup will facilitate meetings to study and find solutions to the challenges currently limiting the use of Enhanced Aquifer Recharge (EAR) and ASR-MAR.

ASR-MAR WORKGROUP

WORK GROUP CO-CHAIRS: OVERVIEW



CHI HO SHAM, PH.D.

VP and Chief Scientist, Eastern Research Group

Co-Chair, ASR – MAR Workgroup

ASR-MAR WORKGROUP

WORK GROUP CO-CHAIRS: OVERVIEW

LORRIE COUNCIL

UIC Program Liaison

Texas Commission on Environmental Quality

Co-Chair, ASR – MAR Workgroup

ASR-MAR WORKGROUP

WORK GROUP CO-CHAIRS: OVERVIEW

KAREN FERET

Associate Branch Chief – Prevention Branch

Office of Ground Water and Drinking Water, U.S. EPA

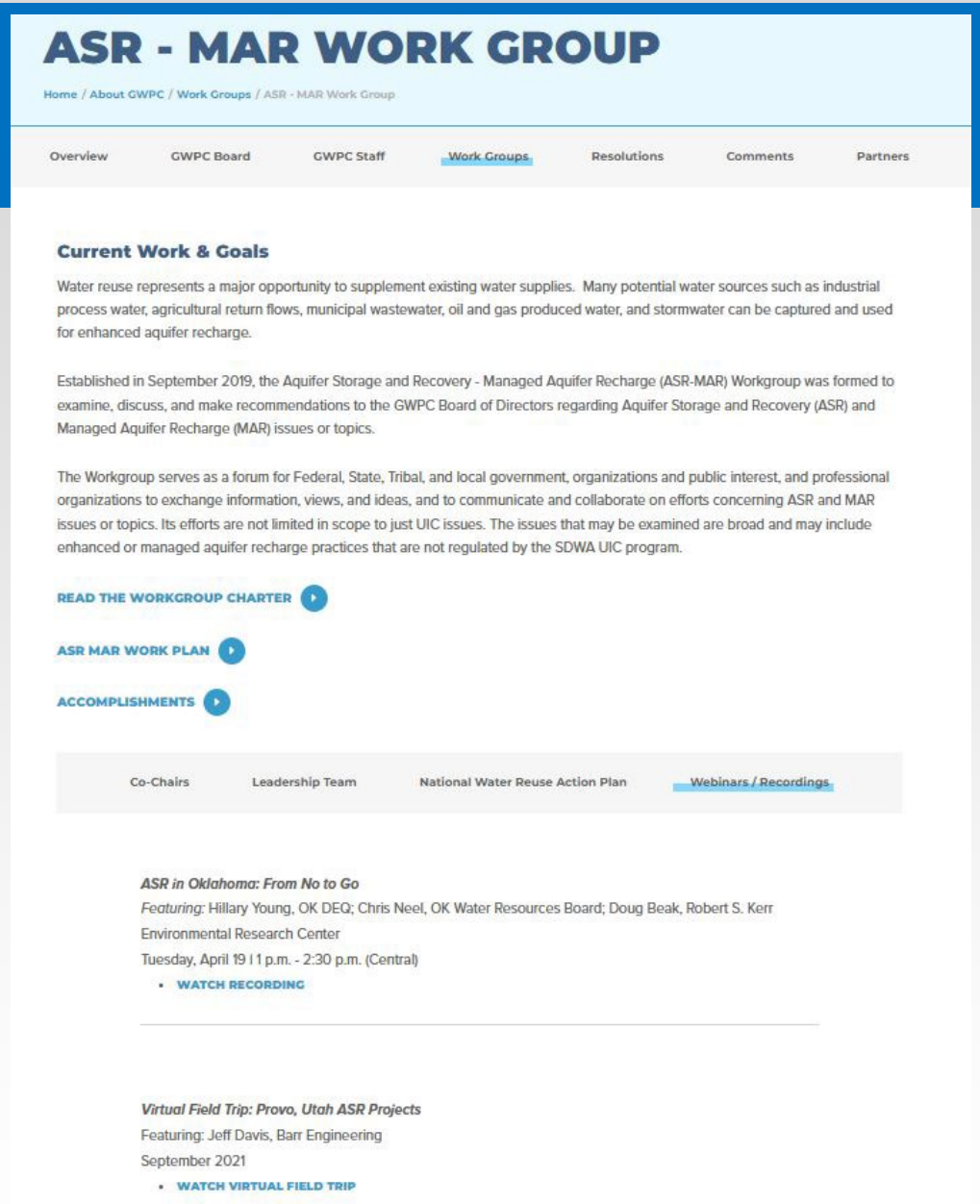
ASR-MAR WORKGROUP

WORKGROUP LEADERSHIP TEAM

Federal Government	• **Doug Beak**, US EPA, Robert S. Kerr Environmental Research Center • **Andrew O'Reilly,** USDA — Agricultural Research Service
Tribal, State, Territory and/or Local Government Agencies	• **Andrea Croskrey**, Texas Water Development Board
Interested Organizations and/or Water Professionals	• **Tim Parker**, Parker Groundwater • **Frederick Bloetscher**, Florida Atlantic University

ASR-MAR WORKGROUP

QUARTERLY WEBINARS



ASR - MAR WORK GROUP

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Overview | GWPC Board | GWPC Staff | Work Groups | Resolutions | Comments | Partners

Current Work & Goals

Water reuse represents a major opportunity to supplement existing water supplies. Many potential water sources such as industrial process water, agricultural return flows, municipal wastewater, oil and gas produced water, and stormwater can be captured and used for enhanced aquifer recharge.

Established in September 2019, the Aquifer Storage and Recovery - Managed Aquifer Recharge (ASR-MAR) Workgroup was formed to examine, discuss, and make recommendations to the GWPC Board of Directors regarding Aquifer Storage and Recovery (ASR) and Managed Aquifer Recharge (MAR) issues or topics.

The Workgroup serves as a forum for Federal, State, Tribal, and local government, organizations and public interest, and professional organizations to exchange information, views, and ideas, and to communicate and collaborate on efforts concerning ASR and MAR issues or topics. Its efforts are not limited in scope to just UIC issues. The issues that may be examined are broad and may include enhanced or managed aquifer recharge practices that are not regulated by the SDWA UIC program.

READ THE WORKGROUP CHARTER

ASR MAR WORK PLAN

ACCOMPLISHMENTS

Co-Chairs | Leadership Team | National Water Reuse Action Plan | Webinars / Recordings

ASR in Oklahoma: From No to Go

Featuring: Hillary Young, OK DEQ; Chris Neel, OK Water Resources Board; Doug Beak, Robert S. Kerr Environmental Research Center

Tuesday, April 19 | 1 p.m. - 2:30 p.m. (Central)

- WATCH RECORDING

Virtual Field Trip: Provo, Utah ASR Projects

Featuring: Jeff Davis, Barr Engineering

September 2021

- WATCH VIRTUAL FIELD TRIP

www.gwpc.org/about-us/work-groups/asr-mar-work-group/

ASR-MAR WORKGROUP

QUARTERLY WEBINARS

"Aquifer Storage & Recovery & Aquifer Recharge Wells in Florida"

Joe Haberfeld, PG, Florida DEP (August 6, 2020)

- Florida – growing population – using ASR wells to augment and preserve water for public supply
- Success of projects dependent on many factors:
  - Hydrogeology, economics, need for water stored, reliability and consistency of project operated
- Highlighted several facilities as examples of types of projects located in Florida
- Evaluation methods used by DEP for success of projects presented

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QUARTERLY WEBINARS

"Managed Aquifer Recharge in California – Long-Term Projects and New Emphasis Under the New Groundwater Law"

Timothy Parker, Parker Groundwater (Nov. 12, 2020)

- Covered California Sustainable Groundwater Management Act (SGMA)
  - Groundwater Sustainability Plans (Requirements and Measurements)
- MAR critical element to achieve sustainability & California has a long history of successful MAR
- Increased state & local technical ability => high probability of success
- Many challenges, but California has demonstrated will, investment and record of success

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QUARTERLY WEBINARS

"What's New with EPA? Reuse, UIC, Stormwater"

Justin Mattingly, Julie Blue, Kara Goodwin, US EPA (Feb. 9, 2021)

- The role of ASR in the National Water Reuse Action Plan
- EAR of stormwater in the US – State of the Science review
- EPA's report on Aquifer Recharge and Aquifer Storage and Recovery in the UIC program

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QUARTERLY WEBINARS

"Tools for Planning, Development, & Improvement of Aquifer Storage and Recovery Projects: Siting & Recovery Efficiency Assessment"

Texas Water Development Board / Texas Commission on Environmental Quality (July 27, 2021)

- Determining ASR project recoverability – Texas regulatory perspective
- Supporting ASR projects in Texas – TWDB science, planning and funding

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QUARTERLY WEBINARS

"Guidance for Understanding & Minimizing Arsenic Mobilization in Aquifer Storage & Recovery" and "Treatment and Management of Inject Water During ASR to Minimize the Potential Release of Arsenic"

Sarah Fakhreddine, PhD & Charles Werth, PhD, University of Texas at Austin (Dec. 2, 2021)

- Provided a comprehensive presentation on increasing our knowledge on the understanding and mitigating arsenic mobilization during ASR
  - Mechanism of arsenic mobilization
  - Site-specific biogeochemical conditions
  - Site-specific operational and biogeochemical compatibility
  - Guidance – modeling, lab experiments, and monitoring
- Treatment strategies (associated with different risks and costs)

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QUARTERLY WEBINARS

"ASR in Oklahoma: From No to Go"

Hillary Young, OK DEQ; Chris Neel, OK Water Resources Board; Doug Beak, Robert S. Kerr Environmental Research Center (April 19, 2022)

- Explored how Oklahoma agencies worked together to create regulatory scheme for ASR, ASR research in Oklahoma and projects

ASR-MAR WORKGROUP

FUTURE PLANS – HOW TO GET ENGAGED

- Attend quarterly webinars
- Questions? Reach out to GWPC
- Full webinar recordings are available on the ASR-MAR Workgroup website
- https://www.gwpc.org/about-us/work-groups/asr-mar-work-group/

ASR-MAR WORKGROUP

ASR-MAR Annual Forum Events

DAY ONE - Tuesday, June 21, 2022

ASR-MAR Field Trip to Provo, Utah-*This field trip visited two infiltration sites, Rock Canyon and Riverview Park as well as the diversion where the source water is diverted from the Provo River.*

DAY TWO - Wednesday, June 22, 2022

Aquifer Storage & Recovery – Managed Aquifer Recharge Session 1

Moderator: Chi Ho Sham, ERG

- "***GWPC ASR-MAR Workgroup Overview***" | *Co-chairs* Chi Ho Sham & Lorrie Council
- "***More Managed Aquifer Recharge (MMAR) – A Solution to Combat Droughts and Climate Change in the West***" | R. Jeffrey Davis, Integral Consulting
- "***Aquifer Characterization for Brackish Groundwater Production and Aquifer Storage and Recovery (ASR): A Case Study on the Carrizo-Wilcox Aquifer in Central Texas***" | Andrea Croskrey, Texas Water Development Board

DAY TWO - Continued

Aquifer Storage & Recovery – Managed Aquifer Recharge Session 2

Moderator: Lorrie Council, Texas Commission on Environmental Quality

- "***Statewide Mapping of California's Aquifers with Airborne Electromagnetics***" | Timothy K Parker, Ramboll
- "***Managed Aquifer Recharge for Sustainable Groundwater-Irrigated Agroecosystems Utilizing Riverbank Filtration and Groundwater Transfer and Injection***" | Andy O'Reilly, USDA Agricultural Research Service
- "***The ASCE/EWRI Standard Guidelines for Managed Aquifer Recharge***" | Gordon McCurry, McCurry Hydrology, LLC

DAY THREE - Thursday, June 23, 2022

- ***ASR-MAR Workgroup Breakfast Discussion*** - All Welcome | In Person Only (Snowbird) - 7:30 a.m. - 8:30 a.m. (Mountain Time)

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