

Class V: Aquifer Storage and Recovery (ASR) in Region 8

Craig Boomgaard, P.G., PMP

USEPA Region 8

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Region 8 (R8) – Class V

- Primacy States – North Dakota, Utah, Wyoming
- Direct Implementation (DI) – Colorado, Montana, South Dakota, Indian Country

Colorado vs. Florida ASR

- Injection Zone Lithology: Colorado - Sandstone; Florida - Limestone
- Transmissivity (ft²/day)
 - Colorado Arapahoe Formation - 400 to 1,200
 - Florida Upper Floridan - 5,000 to 10,000
- Total Dissolved Solids (TDS) mg/L
 - Colorado Arapahoe Formation 100 – 1,000
 - Florida Upper Floridan 500 - 2,000+
- Mobilization Concern: Colorado Arapahoe– uranium; Florida - arsenic

*Data Source: Various USGS Publications

Regulatory Oversight Methodology

- Prior to 2011 R8 (DI) authorized by rule (RA) all ASR projects
- From 2011 to 2012, R8 staff reviewed all of the existing DI ASR facilities triggered by a HQ initiative to examine this well class.
 - Confirmed current operational status
 - Coordinated with ORD, R8 Toxicologist, and Drink Water team
 - Reviewed submitted data with an eye toward new MCLs and constituents including disinfection by products
 - Requested additional data as needed using 144.27 authority
 - All except one facility remained under RA, one Permit/Close
 - Most banked water instead of true ASR

R8 Methodology (continued)

- In 2015, R8 saw a resurgence of interest in ASR in Colorado
 - One new and two requesting restart of dormant systems
 - Authorize cycle testing under RA
 - Results of cycle testing determine next steps
 - Coordination with team

R8 Methodology (continued)

- Source water treatment – surface or groundwater
 - Chlorine, chloramine, no disinfection
 - N-nitrosodimethylamine (NDMA) - 7 ng/L {ppt}, THMs, haloacetic acids
 - Degradation analyses

Why do we care about NDMA?

- Drinking water source aquifer
- Very difficult to treat/remove
- Characteristics

Summary of ASR in R8

- RA cycle testing and evaluate
- Examine source water and treatment methods
- Test for DBPs, especially NDMA
- Keep up with new constituents

Questions?

Craig Boomgaard, P.G., PMP

Boomgaard.Craig@epa.gov

303.312.6794