Washington State Department of HEALTH

WASHINGTON STATE DOH ASR UPDATE

Jeff Johnson, PE, LHG, DOH Office of Drinking Water

Washington State DOH ASR Regulatory Update

Drinking Water Advisory Group Meeting

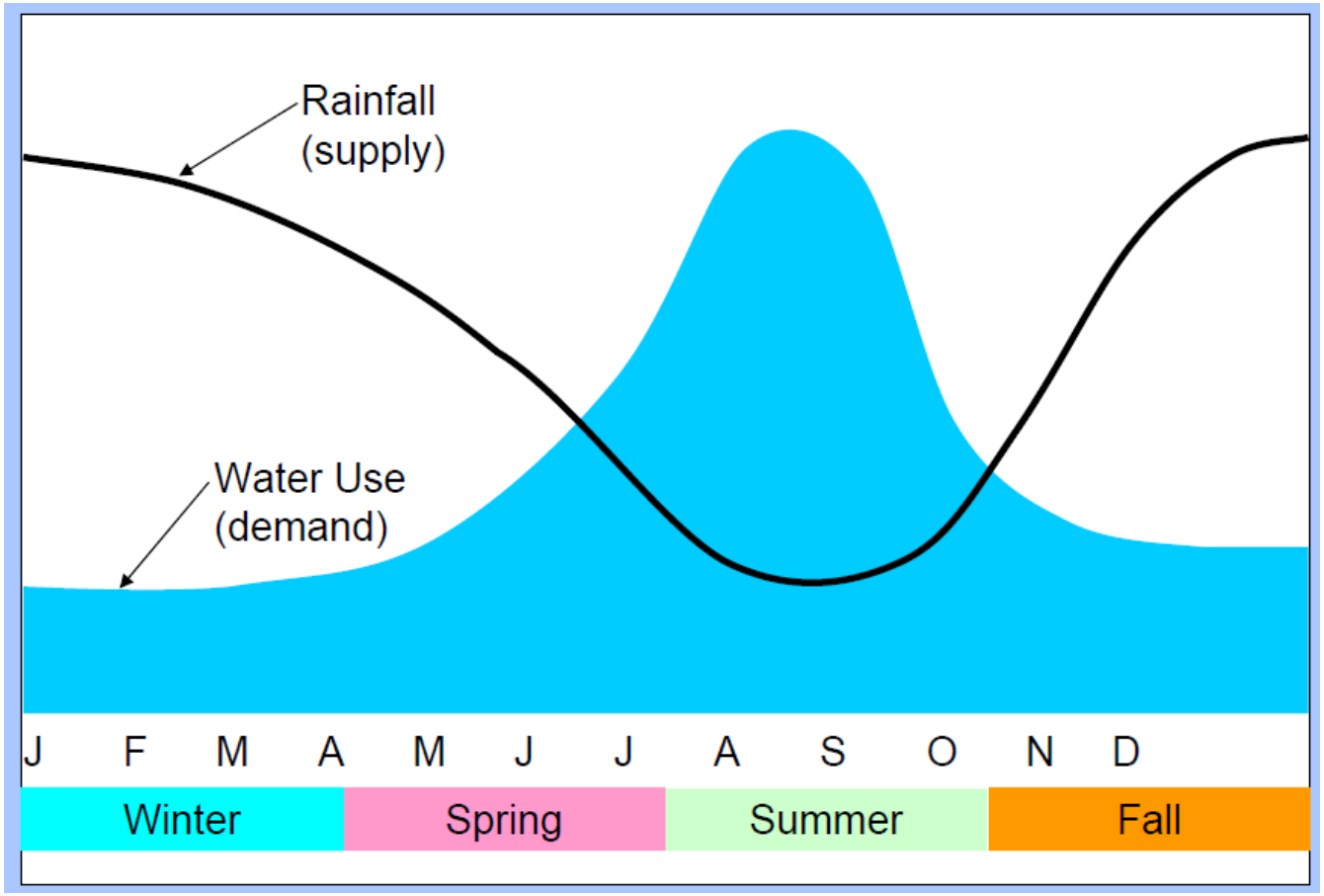
September 14, 2026

Jeff Johnson, PE, LHG
Engineering & Technical Services Section
DOH Office of Drinking Water

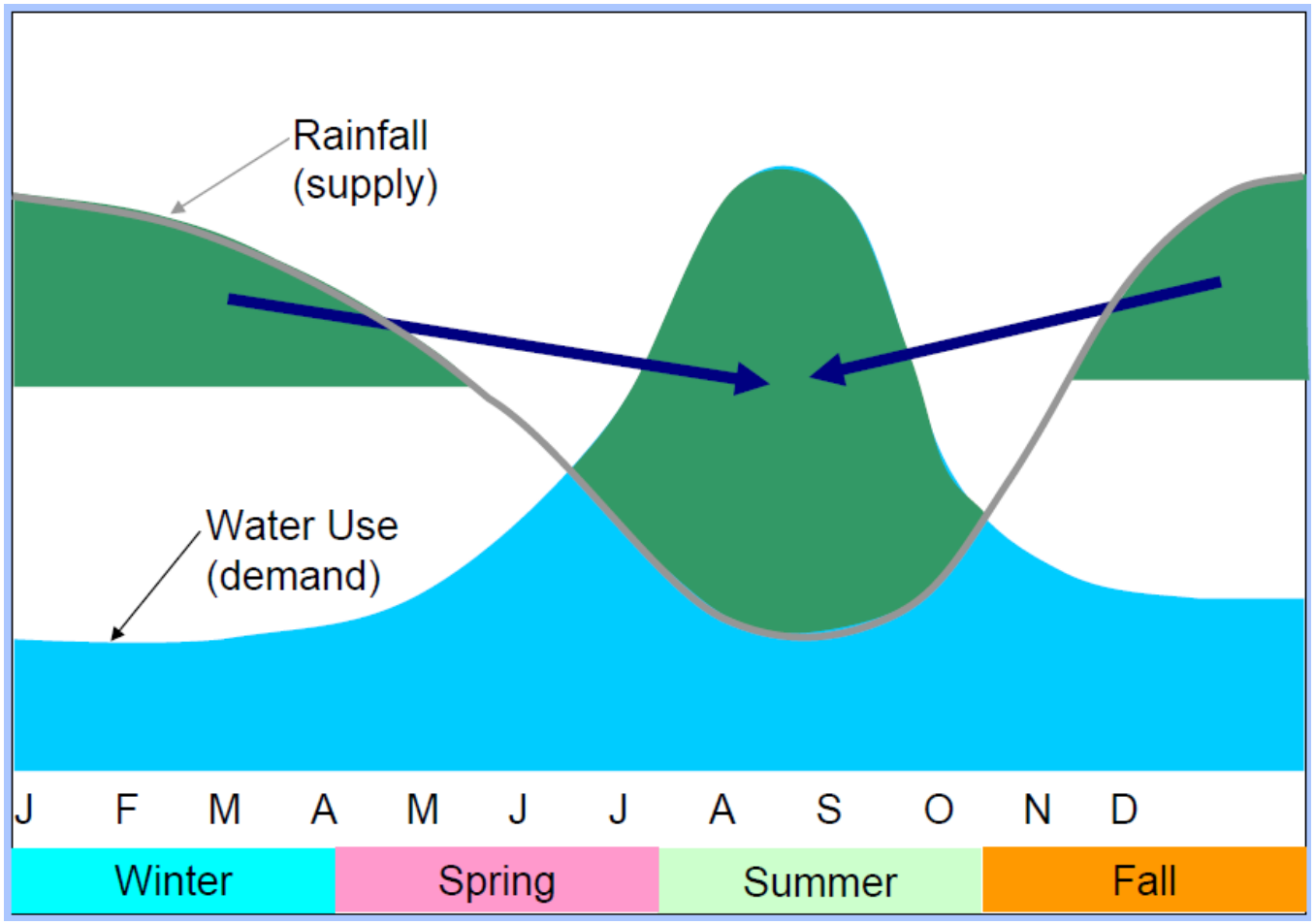
Today's Discussion

- ASR Primer
- Regulatory Framework for Artificial Storage and Recovery (ASR) in Washington
- Drinking Water ASR Installations In Washington State
- Proposed ASR Rule change

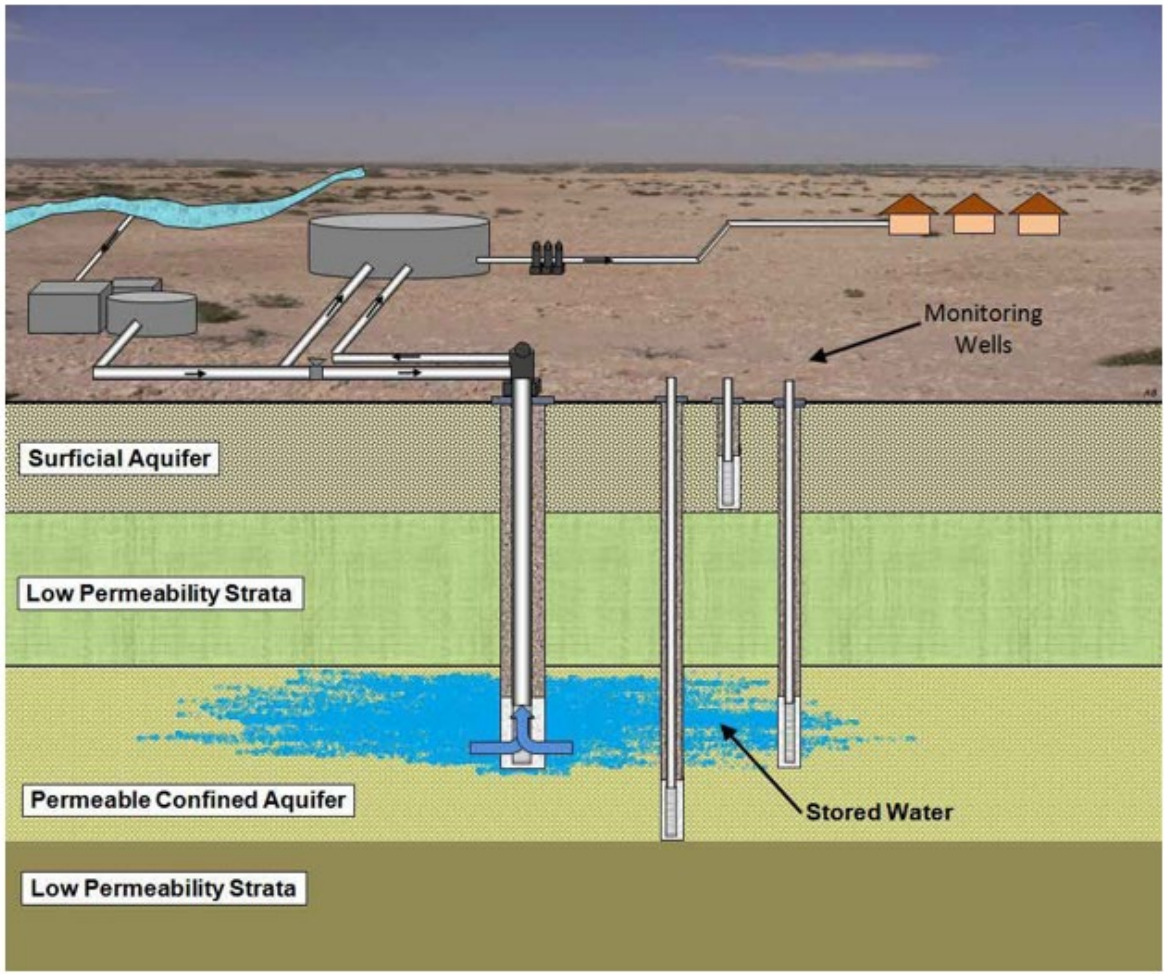
The problem


Rainfall
(supply)
Water Use
(demand)
J F M A M J J A S O N D
Winter
Spring
Summer
Fall

The solution that ASR can provide

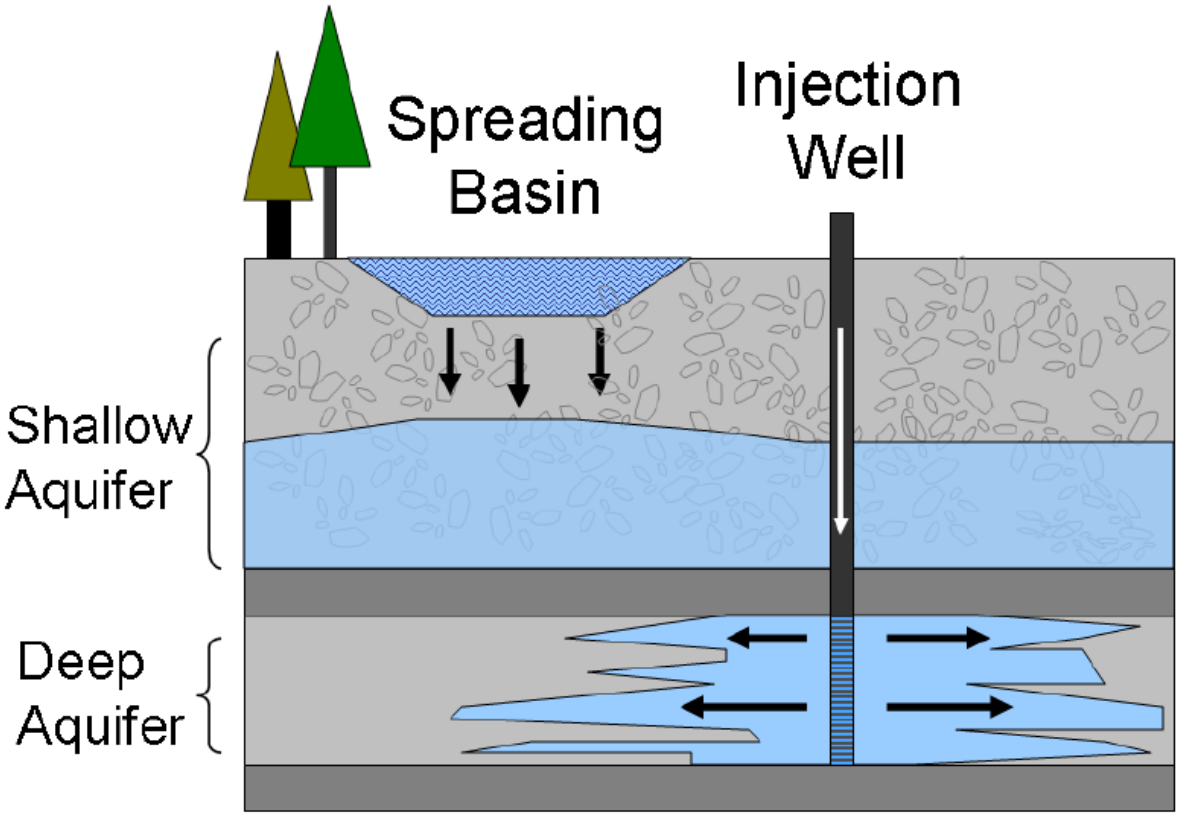


Typical ASR project setup



Methods for getting water into the ground

- Infiltration
- Injection



Summary of Benefits of ASR

- May cause less environmental impact or use less surface area than reservoirs.
- Lower cost than surface storage.
- Helps plan for expected population growth and climate change projections that put a premium on the need for water storage
- Provides supplemental supply

Regulatory Framework for ASR in WA

- What is ASR?

"Those projects where the intent is to artificially store water in an underground geological formation through injection, surface spreading and infiltration, or other department-approved method, and to make subsequent use of the stored water."

WAC 173-157-040

Regulatory Framework for ASR in WA

Underground Artificial Storage and Recovery Reservoir Permit Pre-Application Process

This is a working flow chart for coordination between OCR, WQ and WR Ecology programs during the pre-application period for potential Aquifer Storage and Recovery (ASR) projects with OCR funding agreements.

Note: Written reports in bold yellow highlight. Color coded roles: WQ in green, WR in blue and OCR in orange, DOH in purple

DEPARTMENT OF ECOLOGY
State of Washington

Pre-application meeting with applicant, **WQ, WR, OCR, DOH**

Feasibility Study Report with Implementation Plan

WQ, WR, OCR DOH review and recommendation

WQ reviews Report and recommendation provided

Aquifer testing and WQ sampling **QAPP**

WQ review

Aquifer testing and water quality characterization and Geochemical Compatibility Modeling (water-water and rock-water) Summarize in **Data Collection Report**

WQ reviews report and recommends additional work

Additional aquifer testing & WQ characterization if needed to determine WQ criteria for project compliance

Decide if project will comply with WQ Criteria and WQ feedback to proponent

No

Yes

AKART report & Request for OPI determination

Additional treatment or other measures

Yes

Reservoir Permit Application Submitted with **Final compiled Feasibility Report**

Pre-Application Form:
Proposed source water and water rights
- Proposed reservoir if known
- Anticipated issues
- AKART anticipated?
- List of references (background reports)
- Application approach

WQ Resources/Guidance:
- Purple Book-Reclaimed water guidance
- AKART/OPI Guidance
- Groundwater Quality Standards Imp. 9602

WR Resources/Guidance:
- WR Aquifer Test Guidance
- Applicant to discuss any permit requirements for aquifer testing with WR

General Guidance
- ASR Application Instructions
- ASR overview Flow chart
- QAPP guidance

Implementation plan includes steps and timeline to address WAC 173-157-:
- Conceptual model (-120)
- Project Operation Plan (-130)
- Legal Framework (-140)
- EAA (SEPA for full project) (-150)
- Mitigation Plan (-160)
- Monitoring plan (-170)

Assess GW quality compliance (WAC 173-200) & other WQ requirements[1], include:
- Existing WQ data on
  - Background[2] data (8 samples)
  - Injection water
  - Aquifer
  - Aquifer matrix (chip samples)
- Numerical Simulation predictions of potential geochemical reactions in aquifer
- Identify data gaps and next steps

- WQ Feedback on next steps and additional data needs from Feasibility Study report review
- Identify data gaps and ok to proceed to QAPP
- DOH check-in
- OCR and WR provide non-WQ review of Feasibility study and identify additional data gaps

Complete QAPP to address:
1) All sampling/testing:
   -aquifer test
   -WQ sampling to fill WQ data gaps
   -modeling (on case-by-case basis)
2) QAPP review by OCR, WQ, and WR, with copy to DOH, as needed)
3) OCR approves QAPP before field work.
4) Note additional QAPPs may be needed for future sampling efforts.

- Refine predicted geochemical reactions using new data
- Potential for additional geochemical modeling, as needed
- OCR, WQ, WR review of final report
- WQ reviews and recommends additional data collection, if needed
- Send to DOH for information and review (if DOH requested additional data collection)

AKART report and request for OPI.
- AKART and WQ sampling report included in Final compiled feasibility report. Feedback on OPI request and reviewed as part of final compiled feasibility report[3]

- Final report compiles all reporting to date in one document. WQ, WR, and OCR review. If part of funding agreement, OCR reviews for agreement deliverable before submittal for permit application
- Send copy to DOH for information

NOTES:
1. Refer to WQ Resources Guidance provided at pre-application meeting (ECY publications nos. 15-10-024 and 17-10-035).
2. Background groundwater quality conditions must be established according to the procedure defined in the Groundwater Quality Implementation Guidance (ECY Publication no. 96-02, Section 4.2.1.1.3). Background conditions should be used to define criteria for assessing compliance with the Groundwater Quality standards and to determine that the ASR operation is not violating anti-degradation.
3. Notes on timing/next steps: WQ issues OPI with ECY Director approval OR denial before a permit decision. Informal feedback to applicant would happen as part of application review and before preliminary permit for pilot testing. (Preliminary permit(s) for pilot testing issue after reservoir application submitted and are based on application.) Reservoir permit includes WQ criteria, monitoring & reporting.
4. WQ = Ecology Water Quality Program, WR = Ecology Water Resources Program; OCR = Ecology Office of Columbia River; DOH = WA Department of Health

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Regulatory Framework for ASR in WA

- Department of Ecology has broad authority and responsibility for regulating waters of the state (quality and quantity). Example: ASR Rules in WAC Chapter 173-157.

- Department of Health has authority and responsibility for protecting public health by regulating Public Water Systems as they obtain and distribute water for drinking and other uses (quality and quantity); see WAC Chapter 246-290.

What standards does the injection water need to meet for an ASR project?

Source water used to recharge groundwater (aquifers) are regulated under:

- Safe Drinking Water Criteria (WAC 246-290)

  Requires the quality of the water recharged to the aquifer meet drinking water standards

- Groundwater Quality Standards (WAC 173-200)
  - Groundwater quality standards must be maintained in the receiving aquifer
  - Anti-degradation of groundwater
- UIC approval (WAC 173- 218)

Injection Water Compatibility With the Proposed ASR Aquifer

- Higher oxygen content source water reacts with aquifer sediments and rock to dissolve aquifer matrix and **increase metals concentrations** in groundwater.
- Constituents in source water react with groundwater constituents to **precipitate minerals** that plug up aquifer pore spaces and reduce the aquifer injection and recover capacity.
- Chlorine in source water reacts with organic materials in the aquifer to **form trihalomethanes.**

Spotlight on Key Drinking Water Rules

- Spotlight on DOH rule for Source Approval—excerpt from WAC 246-290-130

WAC 246-290-130 Source Approval

(1) Every purveyor shall obtain drinking water from the highest quality source feasible. **Every purveyor shall, prior to using a source as a public water supply, obtain approval from the department for:**

(a) All new sources.

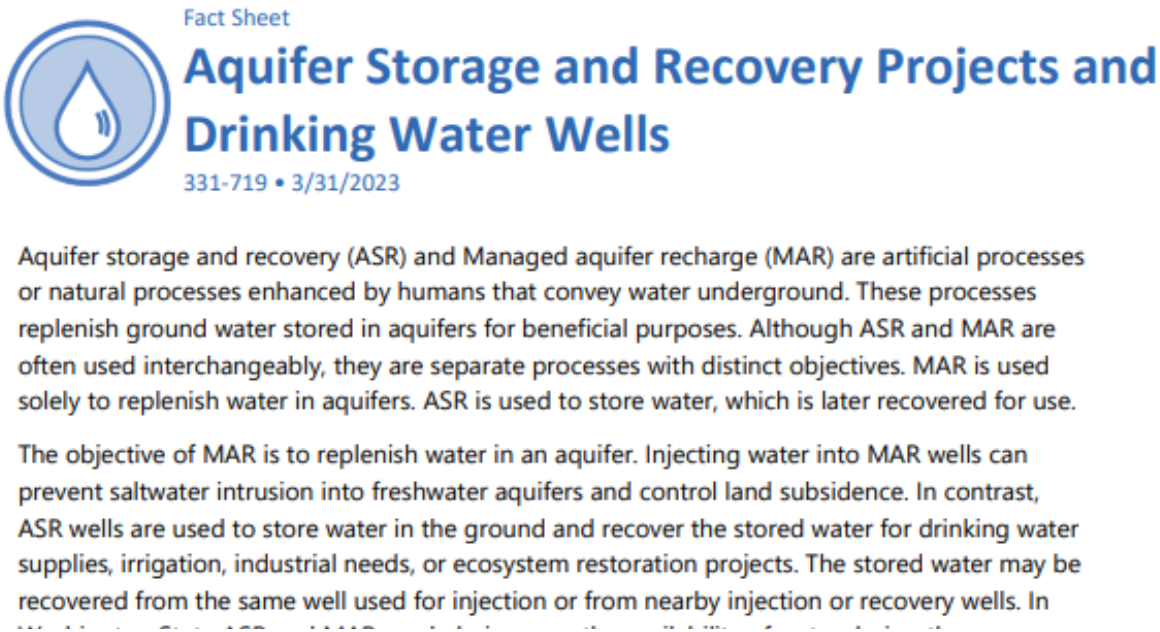
(b) Previously unapproved sources.

(c) Modifications to existing sources.

(2) In no case may a purveyor maintain an intake or other connection between a public water system and a source of water not approved by the department.

Spotlight on Key Drinking Water Rules

- Drinking water ASR projects with direct injection into the aquifer: injected water must be potable and have DOH written approval before it goes into the ground.
- DOH Fact Sheet 331-719



Fact Sheet

Aquifer Storage and Recovery Projects and Drinking Water Wells

331-719 • 3/31/2023

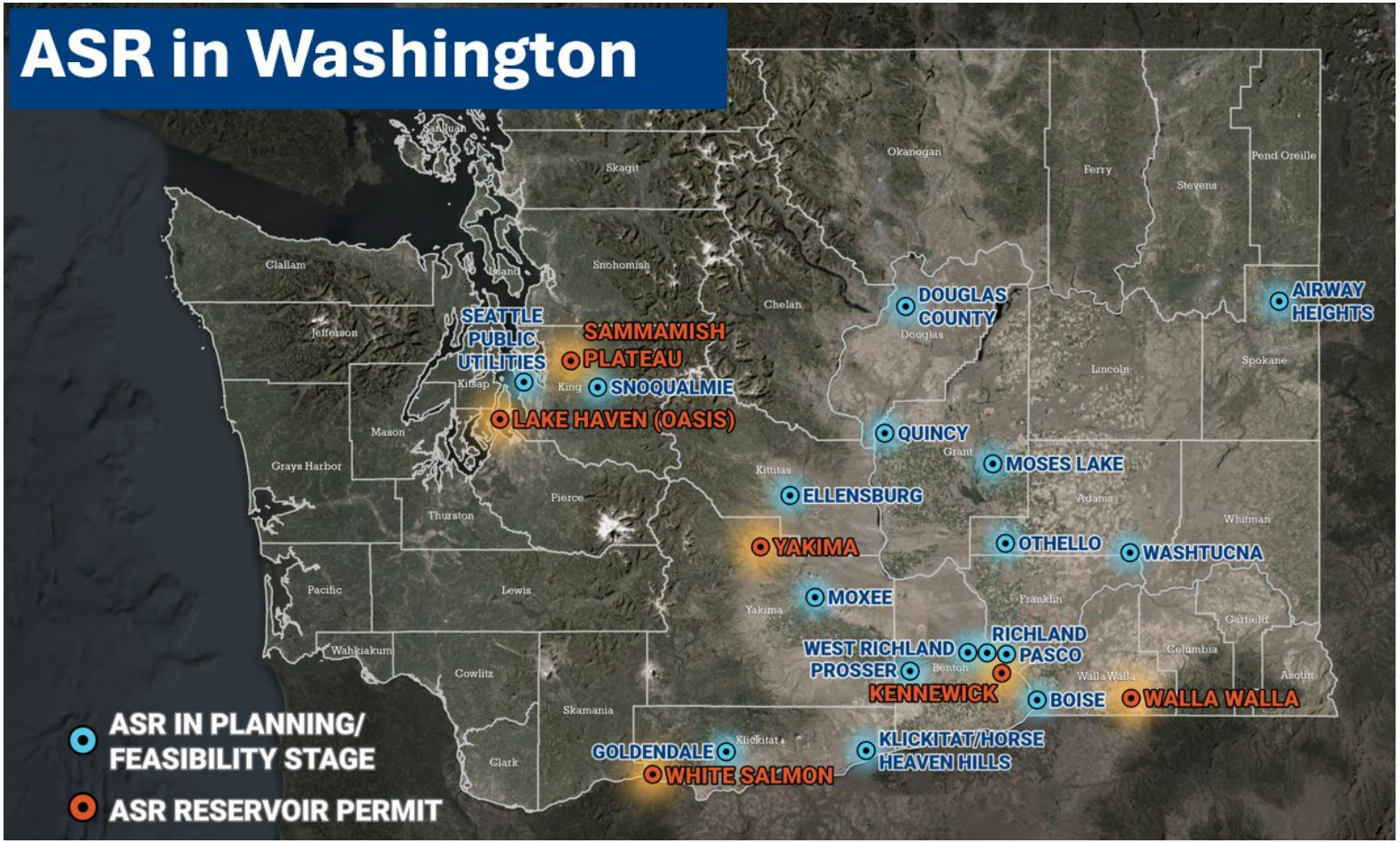
Aquifer storage and recovery (ASR) and Managed aquifer recharge (MAR) are artificial processes or natural processes enhanced by humans that convey water underground. These processes replenish ground water stored in aquifers for beneficial purposes. Although ASR and MAR are often used interchangeably, they are separate processes with distinct objectives. MAR is used solely to replenish water in aquifers. ASR is used to store water, which is later recovered for use.

The objective of MAR is to replenish water in an aquifer. Injecting water into MAR wells can prevent saltwater intrusion into freshwater aquifers and control land subsidence. In contrast, ASR wells are used to store water in the ground and recover the stored water for drinking water supplies, irrigation, industrial needs, or ecosystem restoration projects. The stored water may be recovered from the same well used for injection or from nearby injection or recovery wells. In

Spotlight on Key Drinking Water Rules

- If you can—use water from an existing DOH-approved source. Very limited DOH involvement in ASR permitting process in this case.
- If the water source is not approved, we are very happy to work with you through the source approval process including whatever treatment is needed.

Current Operational Drinking Water ASR Projects in WA—Examples



Proposed RCW Change

- Proposed by Columbia Basin Sustainable Water Coalition

- Water Quality Proposal: ASR project deemed to comply with state water quality standards if:
  - It is likely that stored volume = recoverable volume.
  - Quality of stored water will not interfere with beneficial uses if unrecovered.
  - Project is protective of aquatic resources.
  - Injection water quality = DOH standards

- Water Quantity Proposal: recovery can be over multiple years and up to but not exceeding the amount injected.

Proposed RCW Change

- Does the proposal support our primary need for the injection water at DW ASR projects to be ODW-approved potable water
- Proposal may inadvertently remove the requirement to assess injection water compatibility with the aquifer materials
- Reference to general DOH rule-making authority may cause confusion/misunderstanding

Questions?

Thank You!

Jeff Johnson, PE, LHG

Engineering and Technical Services Section

Office of Drinking Water

jeff.johnson@doh.wa.gov

Drinking Water Systems | Washington State Department of Health

@WADeptHealth

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