

AQUIFER STORAGE AND RECOVERY

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Aquifer Storage and Recovery

- Began with ASR workgroup
 - DEQ, OWRB, ODAFF, USGS, OCC, OGS, Kerr Lab, Consultants, City of Ada, etc.
 - The group developed a path forward to allow ASR in OK
- S.B. 1219 (2016)
 - OWRB shall issue ASR permit (water rights) if:
 - OWRB approved the Site Specific ASR Plan (SSASRP)
 - Applicant has legal access to water stored pursuant to SSASRP
 - Applicant stored or caused to be stored subject water pursuant to and in compliance with DEQ permit; and
 - Stored water is available for use as described in the application

What actions needed to occur?

- OWRB needed to amend Water Quality Standards to provide an avenue for ASR to be permitted
- DEQ needed to create rules related to its authority to permit ASR facilities
- OWRB needed to amend its rules related to water quantity permitting (water rights)

OWRB

- Amend Water Standards
 - OWRB made changes to water standards (Chapter 45) in relation to ASR projects

- Amend Water Quantity Permitting
 - OWRB created a new Chapter 32 – Aquifer Storage and Recovery
 - Worked with DEQ to ensure consistency
 - Site Specific Aquifer Storage and Recovery Plan

DEQ – ASR rules

- Chapter 653. Aquifer Storage and Recovery
- Delivery of water into an aquifer for later recovery and use
- Three permits
 - ASR treatment plant construction
 - ASR water delivery construction
 - ASR Operations

Before Initiating ASR Activities

- Chapter 653 requires:
 - Statement of Interest
 - Summarizes project goals and objectives
 - Describes methods used to achieve project goals
 - Initial meeting with DEQ
 - Discuss the scope of the project
 - Include OWRB

Raw Water and Aquifer Characterization

- Raw Water and Aquifer Characterization Plan
 - Characterization of raw water
 - Investigation/characterization of aquifer
 - Proposed method for calculating the amount of recoverable water
 - Proposed method of water recovery
 - Discussion of hydrogeologic information
 - Once plan approved, have 1 year to implement (unless extension approved by DEQ)
 - Results submitted to DEQ for approval – effective for 5 years, absent episodic event that changes the characterization of raw water/aquifer

ASR Treatment Plant Construction

- Permit and pilot study required
 - Must meet applicable treatment plant requirements found in other Chapters
- Permit application is three step process – Tier II
 - Raw Water and Aquifer Characterization
 - Submit Engineering Report
 - Submit Final Design Report

ASR Water Delivery Construction

- Permit Required – Tier III
 - Recharge Wells
 - Infiltration Basins
 - Other Water Delivery Mechanisms
- Water delivery pilot test
- Aquifer testing

ASR Operations

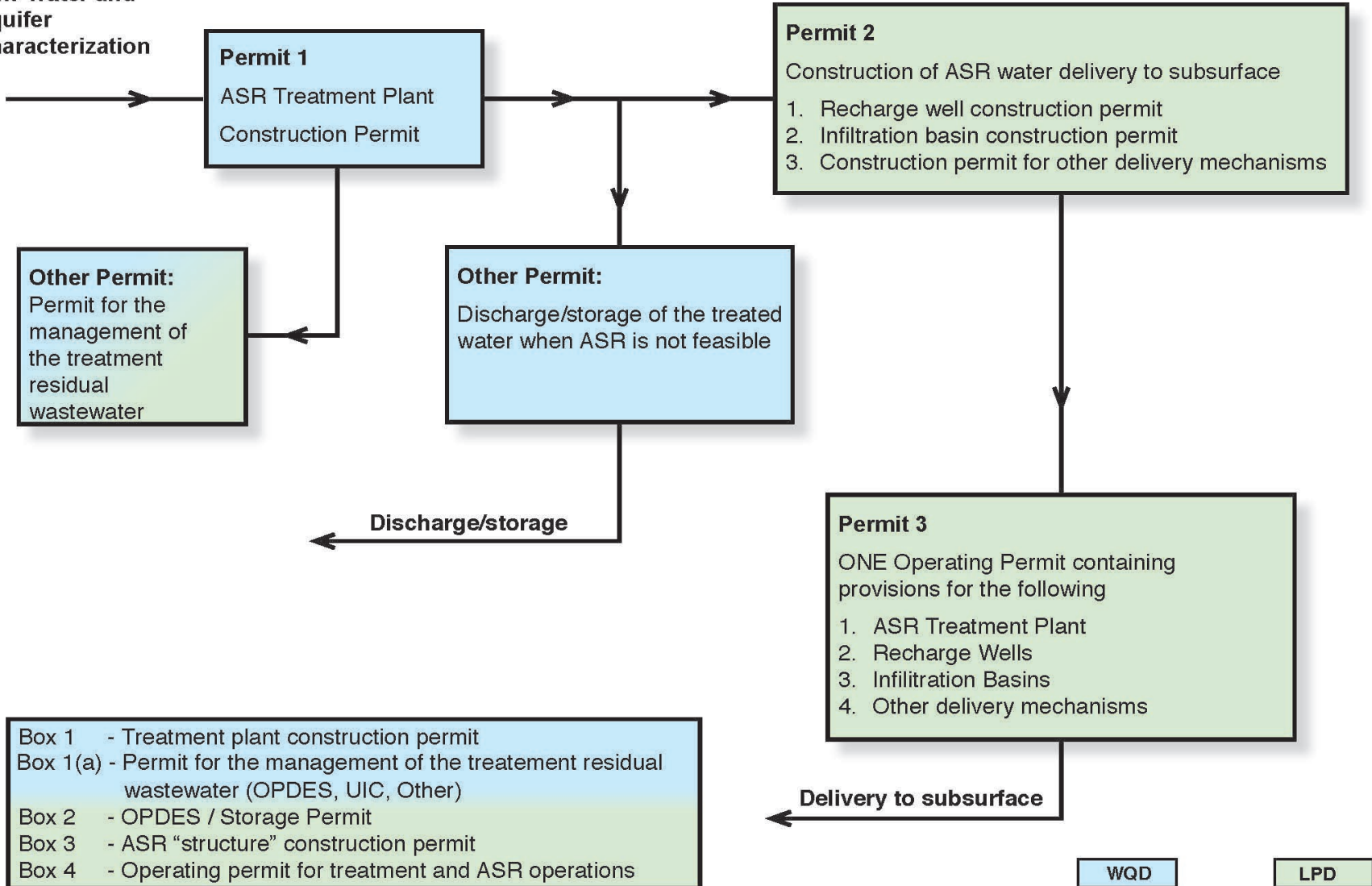
- Permit required – Tier III
- Operation/maintenance
 - ASR treatment plant
 - Recharge wells
 - Infiltration basins
 - Other water delivery mechanism
- Source control
- Groundwater monitoring
- Contingency plan
- Corrective action
- Reporting requirements
- Closure plan

Financial Assurance

- Closure of the facility – required to be in place prior to issuance of operating permit
- Corrective action – required to be in place IF corrective action is required
- Mechanisms

ASR Permitting Flow Chart

Raw Water and
Aquifer
Characterization



Limited Scale ASR - LSASR

- HB 1485 (2017)
 - Title 27A § 2-6-110
- Established limited scale pilot projects for ASR
- Requires a permit following Tier II procedures

Limited Scale ASR - LSASR

- Targeted ASR pilot project
 - Objective is to determine the feasibility of a prospective ASR project or to obtain aquifer and flow characteristic data for research purposes.
- Raw water characterization – if source of raw water is different from the aquifer being used
- Statement of Interest
- Initial meeting with DEQ

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY



DEQ Guidance for Limited-Scale Aquifer Storage and Recovery Pilot Project (LSASR) Applications

Pursuant to 27A O.S. § 2-6-110

Applicability

Applicants requesting a permit for limited-scale ASR pilot projects shall submit a permit application to DEQ meeting the requirements of this guidance document.

Definitions

“**Limited-Scale ASR Pilot Projects**” or “**LSASR**” means targeted ASR pilot projects authorized by 27A O.S. § 2-6-110. The objective of a LSASR is to determine the feasibility of a prospective ASR project or to obtain aquifer and flow characteristic data for research purposes. One example of LSASR might be delivery of water to the subsurface in order to gain a better understanding of subsurface pressure distribution and the fate of the injectate.

“**Area of Hydrologic Effect**” means the area determined by the projected extent of the underground stored water as calculated by using site-specific hydrogeologic information, and as influenced by the specific design of the ASR project.

General Considerations

- (a) This guidance is general in nature.
- (b) It is not designed or intended to address all of the information the Department may need to evaluate an application for a particular LSASR project.
- (c) It does not restrict the Department from including any permit conditions the Department deems necessary or appropriate for protection of the aquifer quality.

Permit Application Required

- (a) Applicants for LSASR shall submit an application to DEQ for review and approval. The application shall also include designs and protocols for raw water treatment for these projects, if applicable.
- (b) No applicant is authorized to begin a LSASR until receiving DEQ approval.

Authority

- (a) DEQ is authorized by 27A O.S. (2017) § 2-6-110 to issue permits for limited-scale pilot projects for the purpose of aquifer storage and recovery. This includes the authority to determine pilot project criteria and establish a process for the consideration of applications.
- (b) DEQ incorporates by reference the federal requirements for its underground injection control program at OAC 252:652-1-3. All applicable rules to ASR projects that are incorporated at OAC 252:652-1-3 shall apply.

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