Public Informational Meeting
Wichita Aquifer Storage and Recovery project proposed changes

Welcome and overview

David Barfield, Chief Engineer
Division of Water Resources
Kansas Department of Agriculture

Halstead, Kansas
June 28, 2018
Outline of the meeting

• Welcome & overview
• City of Wichita presentation
• DWR summary of draft, proposed approval documents and process ahead
• GMD 2 Comments
• Questions and Answers
Meeting purpose

• This meeting concerns itself with requests by the City of Wichita to:
  • Add recovery wells to its project and
  • modify the terms of Phase II of its existing, Aquifer Storage and Recovery Project.

• While not a formal part of the review process, due to the significance of the project to the Region and some complexity in the proposal, we are holding this informational meeting to inform the formal review process to come.
Wichita ASR overview

• State’s only Aquifer Storage and Recovery (ASR) Project.
• Permitted in two phases:
  • **Phase I, 2005**: allows recharge of treated Little Arkansas River surface water and bank storage wells to develop recharge credits and slow the migration of salt water contamination moving toward the wellfield from the Burrton area. It includes five recharge recovery permits.
  • **Phase II, 2009/2010**: allows the recharge of treated Little Arkansas River surface water into the Equus Beds wellfield to accumulate recharge credits for subsequent use by the City. Phase II is designed to permit recharge of up to 30 million gallons per day. It includes 30 recharge recovery permits.
Wichita ASR overview

• The ASR approvals include a rigorous accounting and modeling components to track recharge, recovery and loss of recharge out of the area.

• The approvals define a “Basin Storage Area (BSA)” as part of the accounting, which is the portion of the aquifer used for aquifer storage with defined horizontal boundaries and delimited by a maximum and minimum index levels.
Wichita’s proposed changes

Not a new ASR Project; no expansion of ASR authorities requested.

Three changes are sought by the City:

• **New applications for additional recovery wells** to allow the City to recover recharge credits at its existing production wells, not currently authorized to do so.

• Two requested changes in the terms & conditions for Phase II approvals:
  • lowering of the **minimum index levels** used to determine when the City can withdraw its recharge credits, and
  • **authorization for a new type of recharge credit** from project operations: Aquifer Maintenance Credits (AMCs). AMCs would be allow during times of limited aquifer recharge capacity, where the City would receive recharge credits for treating surface water diverted from the Little Arkansas River and sent directly to town for municipal use, offset by reduced Equus Bed Aquifer use.
Wichita ASR

News:
A public informational meeting regarding proposed changes to the Wichita ASR project will be held at 7:00 p.m. on June 28 at the Halstead High School Auditorium.

The City of Wichita has the state’s only active Aquifer Storage and Recovery project, developed and approved in two phases. The City has filed a series of new applications that will allow it to recover recharge credits at its existing production wells.

On March 12, 2018, the City forwarded a detailed proposal for changes to the conditions associated with its existing permits for Phase II of the project, including the new applications referenced above (see below).

Also below is information related to the City’s existing ASR permits for reference.

City of Wichita request:

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Proposal development / Initial review

- After significant work with DWR, GMD 2, and stakeholders, the City provided its formal proposal on March 12, 2018. DWR posts on web new page.
- March 22, 2018 – DWR letter providing draft, proposed approval documents for review, start initial review
- April 19, 2018 – Special GMD 2 Board meeting to discuss
- April 27 – GMD 2 initial review comments provided
- May 9, 2018 – DWR letter, amending process to include a formal hearing
- May 22, 2018 – City response to GMD review
- June 1, 2018 – DWR response to GMD review, particularly legal/policy questions; amends proposed approval documents
City’s presentations
Public Informational Meeting
Wichita Aquifer Storage and Recovery project proposed changes

Overview of Draft, Proposed Approval Documents

David Barfield, Chief Engineer
Division of Water Resources
Kansas Department of Agriculture

Halstead, Kansas
June 28, 2018
Why draft, proposed approval documents?

• Due to the significance and complexity of the project, draft approval documents provided to help the GMD and public to fully understand the proposed terms and conditions being considered.

• No decision has been made, but we have worked hard to develop a set of potential terms that meets the City’s needs and meets statutory and regulatory requirements.

• The formal public hearing process will affirm or deny this, including determining whether additional terms and conditions would improve the accounting of AMCs or other changes will better serve the public’s interest.
Proposed Replacement F & O for ASR Phase II

Findings and Order
In the Matter of the City of Wichita's Phase II Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas

Findings

1. That in a Findings, Conclusion and Order dated August 8, 2005, on file in the office of Engineer, in the Matter of the City of Wichita’s Applications To Operate an Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas (“Original Order”), the Chief Engineer, approving Appropriation of Water, File Nos. 45,567; 45,568; 45,659; 45,670; 45,573; 45,574; 45,575; 45,576; and 45,081, declining the appropriation of water for beneficial use.

2. That the Order had 24 Conditions including but not limited to designation of the basin strata and index cells for the project area, locations of the index wells, approved model and methodology, and reporting requirements.

3. That in a Findings and Order dated August 1, 2006, (“Modified Order”), the Chief Engineer approved the Original Order approving Appropriation of Water, File Nos. 45,567, 45,568, 45,569, 45,570, 45,571, 45,572, 45,573, 45,574, 45,575, 45,576, and 46,081, specifically permit Conditions 12, 14, 17, 20, and 23, pertinent to bank storage wells.

4. That on September 18, 2009, the Chief Engineer issued a Findings and Order Appropriation of Water, File Nos. 45,627; 45,714; 45,715; 45,716; 45,717; 45,718; 45,719; 45,720; 45,721; 45,722; 45,723; 45,724; 45,725; 45,726; 45,727; 45,728; 45,729; 45,730; 45,731; 45,732; 45,733; 47,178; 47,179; 47,180; and 47,181.

5. That in a Findings and Order dated December 21, 2009, the Chief Engineer modified the Order and Modified Order, to be referred to as the “City of Wichita’s Aquifer Storage and Recovery Project in Harvey and Sedgwick Counties, Kansas”, without referencing specific file numbers of the Order and Modified Order, and as it related to the City of Wichita’s applications to operate the project, the Chief Engineer approved the project as modified.

Example Proposed F & O amending terms & conditions of an existing ASR Phase II permit

FINDINGS AND ORDER
IN THE MATTER OF PERMIT CONDITIONS UNDER APPROPRIATION OF WATER, FILE NO. 46,714

After due consideration, the Chief Engineer, Division of Water Resources, Kansas Department of Agriculture (hereinafter referred to as the “Chief Engineer”), makes the following findings and order:

FINDINGS

1. That on September 18, 2009, the Chief Engineer approved Appropriation of Water, File No. 46,714, for permit to appropriate groundwater recharge credits accumulated in the Equus Beds aquifer for municipal use, authorizing the applicant, subject to vested rights and prior appropriations, to proceed with the construction of the proposed diversion works and to proceed with all steps necessary for the application of the water to the approved and proposed beneficial use.

2. That under Paragraph No. 19 of the Approval of Application and Notice to Proceed for Appropriation of Water, File No. 46,714, the permit was issued with the condition that “the proposed recovery of water artificially recharge by the City shall only occur when recharge credits are determined to be available in Cell No. 6, and the static water level is above elevation 1,387, mean sea level (msl).” This elevation is based on what was considered to be the lowest aquifer water level for this cell as determined by January 1993 water level measurements (i.e. the bottom of the Basin Storage Area).

3. That on May 6, 2015, the Chief Engineer approved a Findings and Order, which defined “static water level” as the water level measured early in the calendar year (normally in January) prior to the irrigation season, and after allowing time for natural aquifer recovery. In addition, the Order modified the minimum index level (groundwater elevation) for Cell No. 6 to be 1,388.74 feet mean sea level.

4. That the City has conducted extensive modeling and data analysis to indicate that during a prolonged drought, groundwater elevations would drop below the current minimum index levels. This would prevent the City from withdrawing recharge credits when they are most needed.
Draft, June 1, 2018

Example proposed individual approval for one of the new applications

APPROVAL OF APPLICATION
and
PERMIT TO PROCEED
(This Is Not a Certificate of Appropriation)

This is to certify that I have examined Application, File No. 48,704 of the applicant

CITY OF WICHITA
PUBLIC WORKS & UTILITIES-WTP
455 N MAIN ST 8TH FLOOR
WICHITA KS 67202

for a permit to appropriate water for beneficial use, together with the maps, plans and other submitted data, and that the application is hereby approved and the applicant is hereby authorized, subject to vested rights and prior appropriations, to proceed with the construction of the proposed diversion works (except those dams and stream obstructions regulated by K.S.A. 82a-301 through 305a, as amended), and to proceed with all steps necessary for the application of the water to the approved and proposed beneficial use and otherwise perfect the proposed appropriation subject to the following terms, conditions and limitations:

1. That the priority date assigned to such application is July 23, 2013.

2. That the water sought to be appropriated shall be used for municipal use within the City of Wichita and immediate vicinity; within the City of Andover and immediate vicinity; within the City of Bel Aire and immediate vicinity; within the City of Benton and immediate vicinity; within the City of Derby and immediate vicinity; within the City of Kechi and immediate vicinity; within the City of Park City and immediate vicinity; within the City of Rose Hill and immediate vicinity; within the City of Valley Center and immediate vicinity; within the City of Bentley and immediate vicinity, within the boundaries of Rural Water District No. 1, Sedgwick County; within the boundaries of Rural Water District No. 2, Sedgwick County; within the boundaries of Rural Water District No. 3, Sedgwick County; and within the boundaries of Rural Water District No. 8, Butler County; within a tract of land in Sedgwick County, Kansas, beginning at the Southeast corner of Section 25, Township 28 South, Range 2 East, then West 122 miles to the Southwest corner of Section 28, Township 28 South, Range 2
Summary of proposed terms and conditions

• **Lower minimum index cell levels** as indicated in Table 2-11 of the City’s proposal

• **Physical recharge** activities will continue to occur when there is adequate recharge capacity within the aquifer.

• **AMCs may be accumulated only when** index cell water levels are at elevations that **limit physical recharge** into the BSA as provided in the ASR’s operating plan.

• The **AMC accumulation rate** will be dependent on the **quantity of water treated and sent to the City** within the authorization of File No. 46,627.
Summary of proposed terms (con’t)

• AMC accounting:
  • AMCs will annually be assigned to index cells by evenly distributing these credits among the total number of points of diversion within the Equus Beds wellfield in service that year.
  • A one-time, five percent (5%) initial loss will be deducted from the total number of AMCs applied in each index cell.
  • A recurring loss to AMCs, as provided in Figure 15 of the City’s proposal, would be applied annually across the BSA to account for the migration of recharge credits and losses from the BSA.
  • The total accumulation of recharge credits through PRCs and AMCs combined cannot exceed 120,000 acre-feet, which represents the documented amount of aquifer storage available within the ASR project area in 1993.
Summary of proposed terms (con’t)

• The City will develop an **annual ASR Operations Plan** that will be used to evaluate groundwater levels and the aquifer’s physical recharge capacity. This information will determine the extent to which AMCs can be accumulated.

• If water quality in an existing domestic well, within 660 feet of an existing or new ASR well, is degraded by the ASR project such that it no longer meets the current drinking water standards, then the City will remedy the problem without additional cost to the resident.

• If a domestic water well, existing before the filing of these permit applications and within 660 feet of an existing or new ASR well, is **adversely impacted by drawdown** from such ASR well, then the City will re-drill or take other appropriate, affirmative action to restore productivity of such domestic well to the same rate and quality as existed before.

• The draft, proposed approval documents include **additional details** on conditions when AMCs may be withdrawn, as well as metering, reporting, and accounting related to AMCs.
### Wichita ASR

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Wichita ASR - Process ahead

• June 28 – Tonight’s public informational meeting

• Within next 2-3 weeks – Pre-hearing conference, set hearing date, location and procedures

• August 2018 – Formal public hearing including GMD 2 recommendation

• Approx. 3 weeks following hearing – Close of written comment period.

• Fall 2018 – Decision after review of the record
Questions
Wichita plans to use its 40,000 AF native rights to full extent in long term drought. Demands > 40,000 AF to be provided from ASR credits.

In drought, reduced to approx. 71,000 AF/year

Wichita future base demand = 81,690 AF/year

Table 3 – MODSIM-DSS simulation results for the 1% drought resulting in an optimized raw water resource utilization strategy and the sustained viability of Cheney Reservoir

<table>
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<tr>
<th>MODSIM-DSS Variable</th>
<th>Drought Year 1</th>
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<th>Drought Year 3</th>
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<td>92%</td>
<td>62%</td>
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