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Sub File Name ASR (from index)

Sub-Sub File Name Wichita

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Wichita's
Request modification of K.A.R. 5-12-1 and conditions to limitations
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Department of Public Works & Utilities

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David Barfield, P.E.
Chief Engineer
Division of Water Resources
Kansas Department of Agriculture
109 SW 9th St.
Topeka, KS 66612-1283

February 11, 2014

RE: Requested Modification of K. A. R. 5-12-1 and to Conditions and Limitations on ASR Phase II Water Rights

Dear Mr. Barfield,

On December 9th 2013, The City of Wichita (City) met with Division of Water Resources (DWR) staff to discuss the various permit conditions and limitations of the City's Aquifer Storage and Recovery (ASR) project. Topics discussed included the regulations that define the methodology for establishing boundary conditions for ASR projects and; conditions within the ASR permits which limit the recovery of established recharge credits to times in which water table elevations are above the lowest historic aquifer levels which were recorded in January of 1993. As a result of these discussions the City of Wichita presents the following information and makes the following formal requests.

ASR Project Geometry:

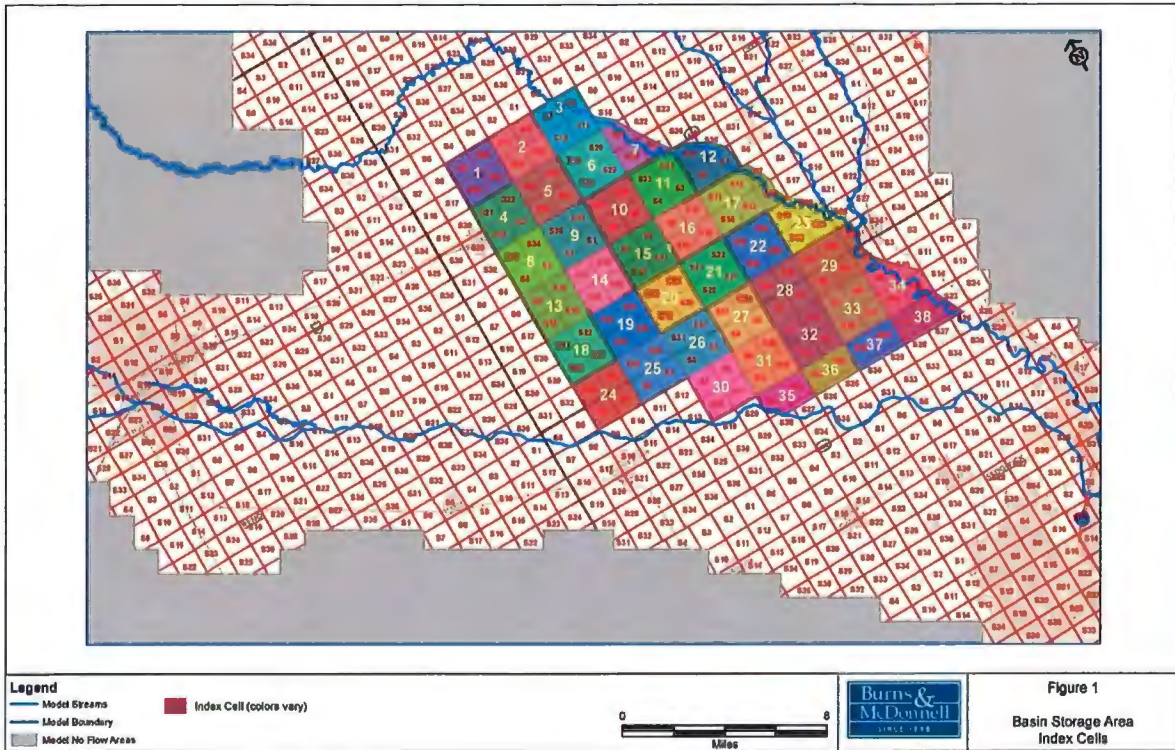
Regulations were developed for the project (K.A.R. 5-12-1) requiring that the horizontal extent and vertical extent of the basin storage area be defined. The horizontal extent of the basin storage area was determined to be bounded by the Little Arkansas and Arkansas Rivers, and the expected areas of influence from both artificial recharge injection and recovery. This area was divided into 38 index cells, as shown in Figure 1. An index well was to be installed in each index cell as a water level monitoring point for regulatory purposes.

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The upper vertical extent of the basin storage area was chosen based on historic high water levels associated with predevelopment (1940) conditions in each of the 38 index cells. The bottom of the basin storage area was calculated by the United States Geological Survey (USGS) using interpolation of water levels from a year of historically-low water levels (January 1993) for each of the index cells as defined within K. A. R. 5-12-1(b)(2).

K.A.R. 5-12-1(b)(2) - *“The vertical extent shall be defined by a minimum and a maximum index water level for the basin recharge storage area, or for each subdivided area within the basin storage area if the basin storage area is subdivided. The minimum index water level shall be the lowest water level within the basin storage area, or smaller subdivided area if the basin storage area is subdivided, that occurred within the 10 years before the filing of the application for a permit to appropriate water, or a period of time longer than 10 years demonstrated by the applicant to reflect the lowest water level. If the basin storage area is subdivided, measurements from the same year shall be used to determine the minimum index water level for each subdivision. The maximum index water level shall represent the maximum storage potential for the basin storage area.”*

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Formal Request:

Based on the operation of the ASR system and previous discussions with DWR, it is requested that K. A. R. 5-12-1 be modified to allow the lower vertical extent of an artificial recharge project area to be better defined by the geologic limits of the storage area such as bedrock or other impermeable boundaries within the project area. Detailed well logs and elevations of bedrock are available for each of the 38 index cells. These well logs would allow for simple and accurate calculations of the lowest vertical extent of the storage area for each index cell. The original methodology used to calculate the maximum storage potential of an artificial recharge project should remain unchanged.

Recharge Credit Recovery:

When the water appropriations were issued by DWR in July of 2005 for Phase I of the ASR project, the Findings and Orders of the Chief Engineer described how recharge credits were to be administered. Within the Findings and Orders for Phase I, Conclusion No. 13 specifically addressed the availability of recharge credit withdrawal in relation to the index water levels and the bottom of the basin storage area

ASR Phase I Conclusion No. 13 - *“That if the project is operated so that recharge credits cannot be withdrawn if the static water level in the index well is below the lowest index water level for that index well, the public interest in not diverting Equus Beds groundwater will be protected.”*

Additionally within the Findings and Orders for the Phase I ASR applications, Order No. 8 reiterates the availability of recharge credits:

ASR Phase I Order No. 8 – *“That water shall only be injected into the basin storage area by means of the injection wells when the water level at any required monitoring well located within 660 feet of an injection well is 10 feet or more below the land surface elevation at those observation wells; that recharge credits may be withdrawn from a cell only when recharge credits are available from the cell and the static water level at its index well is above the lowest index level; however, water may be recharged when the static water level is below the lowest index level in that well.”*

The individual approval conditions for each recharge and recovery well also limited the withdrawal of recharge credits to periods when water levels remain above the lowest index water level in the respective cell (Permit Approval Condition No. 19):

Permit Approval Condition No. 19 – *“That the proposed recovery of water artificially recharged by the City shall only occur when recharge credits are determined to be available from the corresponding cell, and the static water level is above the elevation established as the lowest index water level in that corresponding cell.”*

A primary purpose of Phase I of the ASR project was to reduce the hydraulic gradient in the area and therefore slow the salt water contamination moving towards the wellfield from the Burrton area. Both Conclusion No. 13 and Order No. 8, stem from the principle that withdrawal of

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recharge credits during periods when water levels are below those that existed in 1993 would not serve the public interest because it would deteriorate the hydraulic gradient established by recharge injection.

The limitations to the recharge credit withdrawal relative to the lowest index water levels for Phase I (January 1993) were largely based on maintaining water quality in the City’s well field with a reduced hydraulic gradient. However, it should be noted that water levels in the area can experience significant declines during dry or drought periods, even without the removal of recharge credits from ASR Phase I wells.

In 2009 the appropriations for the wells in Phase II of the ASR project were issued, and virtually duplicated the approval conditions covered in the Phase I appropriations. These appropriations were applied to both existing well locations and proposed new recharge recovery well locations. This included the individual limitation to withdraw recharge credits to periods when water levels are above the lowest index water level (January 1993).

The historic decline in storage volumes within the EBWF area have been calculated by USGS and are illustrated in Figure 2. Examination of the declines in storage volume indicates that during the recent drought, a concerning pattern is emerging.

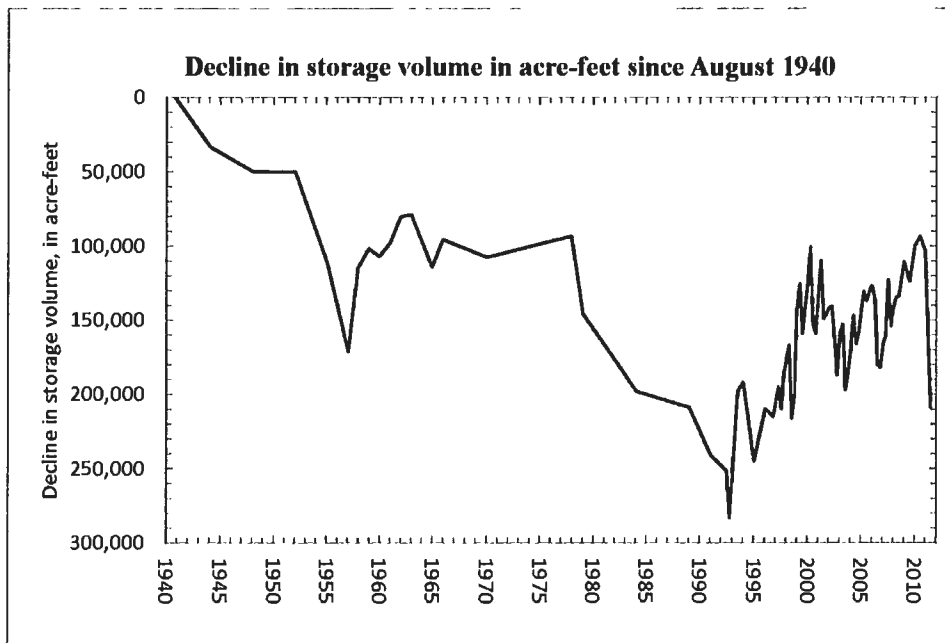


Figure 2

While the City has not increased its usage from the Equus Beds and continues to use only about 50% of its available water appropriations in the Equus Beds, water levels have still declined substantially since 2009. The recent declines can be attributed to the combination of drought (less recharge), and increased irrigation use within the basin storage area

This pattern indicates water levels in the basin storage area for both Phase I and Phase II are not solely dependent on the amount of water that the City utilizes, and that it is conceivable that

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water levels may rapidly return to the 1993 levels or below despite the fact that the City is only using part of its allocation in the area.

Formal Request:

The recent decline in water levels demonstrates that it is appropriate to make modifications to the administration of the City's ASR project. The City is therefore requesting that DWR revise the conditions associated with individual water appropriations granted for Phase II and future recharge/recovery appropriation permits for the ASR project to allow for the withdrawal of recharge credits when they are available, and remove the restrictions limiting recharge credit withdrawal when levels are below the 1993 index water level.

This change will allow the City to operate the ASR project as intended (established storage for times when other resources are limited). The storage capacity of the basin storage area will not change under the request, only the ability to recover recharge credits when they are available as determined by the ASR accounting and DWR authorization.

This request would be applied to water rights: #46,714 to #46,733, #47,178 to #47,181 and #47,448 to #47,453 as well as recharge credit recovery rights associated with ASR Phase II Municipal wells authorized by Files HV006, #388 and #1006 as well as future ASR applications. Modification of ASR Phase I water rights is not included as part of this request.

The City appreciates your consideration and would be happy to meet with your staff to provide any additional information that may be required to fully consider this request.

Respectfully,



Michael G. Jacobs, P.E.
City of Wichita
Public Works & Utilities
Water Planning and Production Manager

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