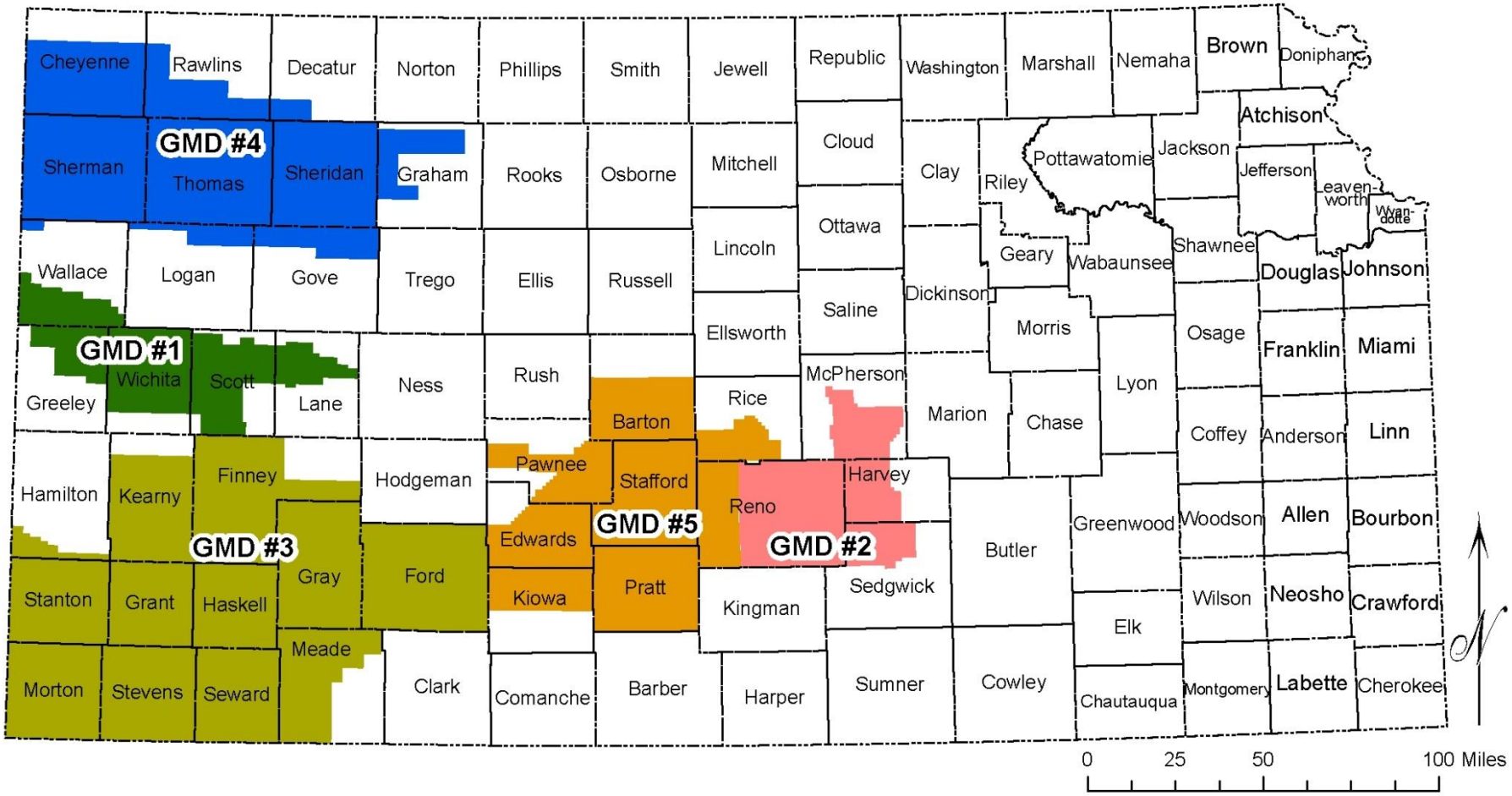
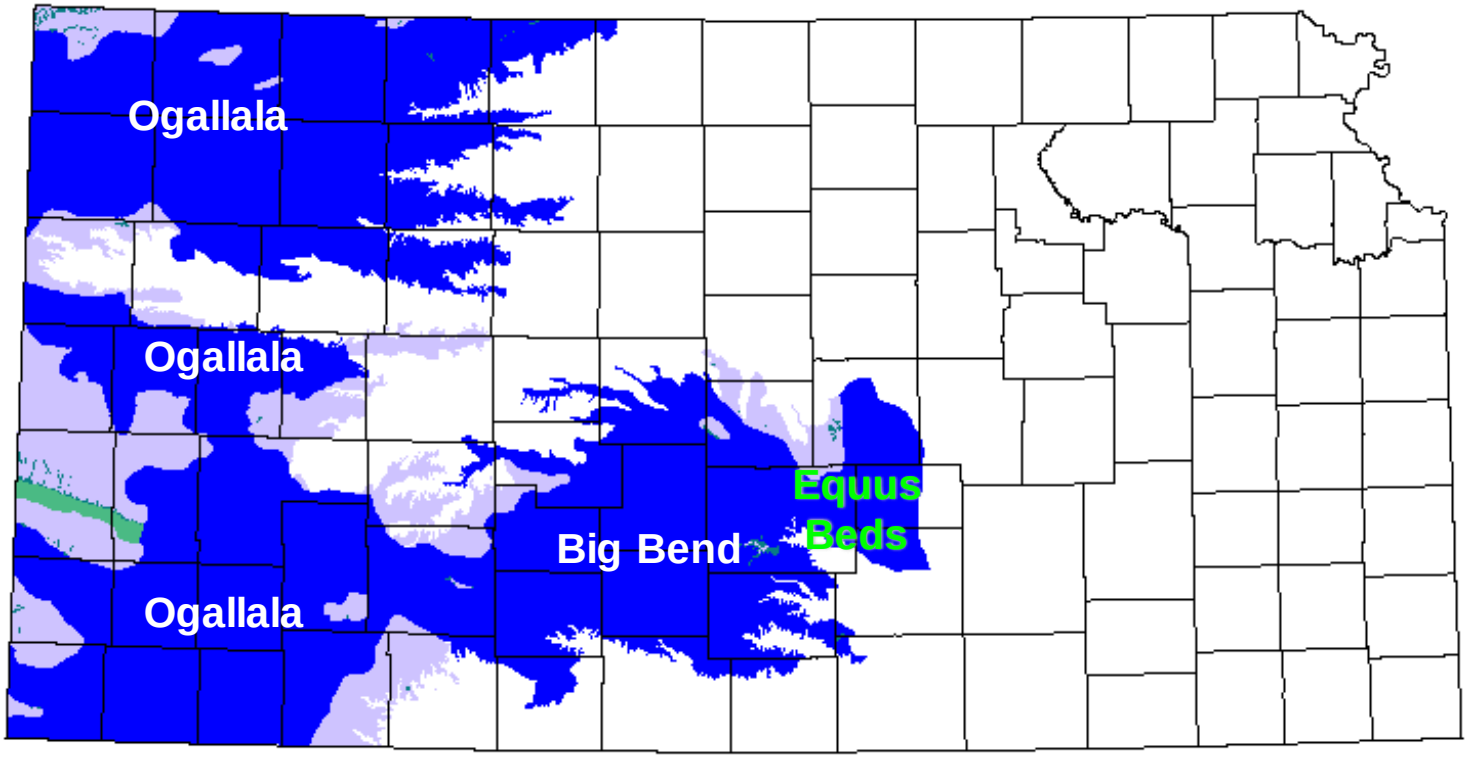
Kansas Groundwater Management Districts



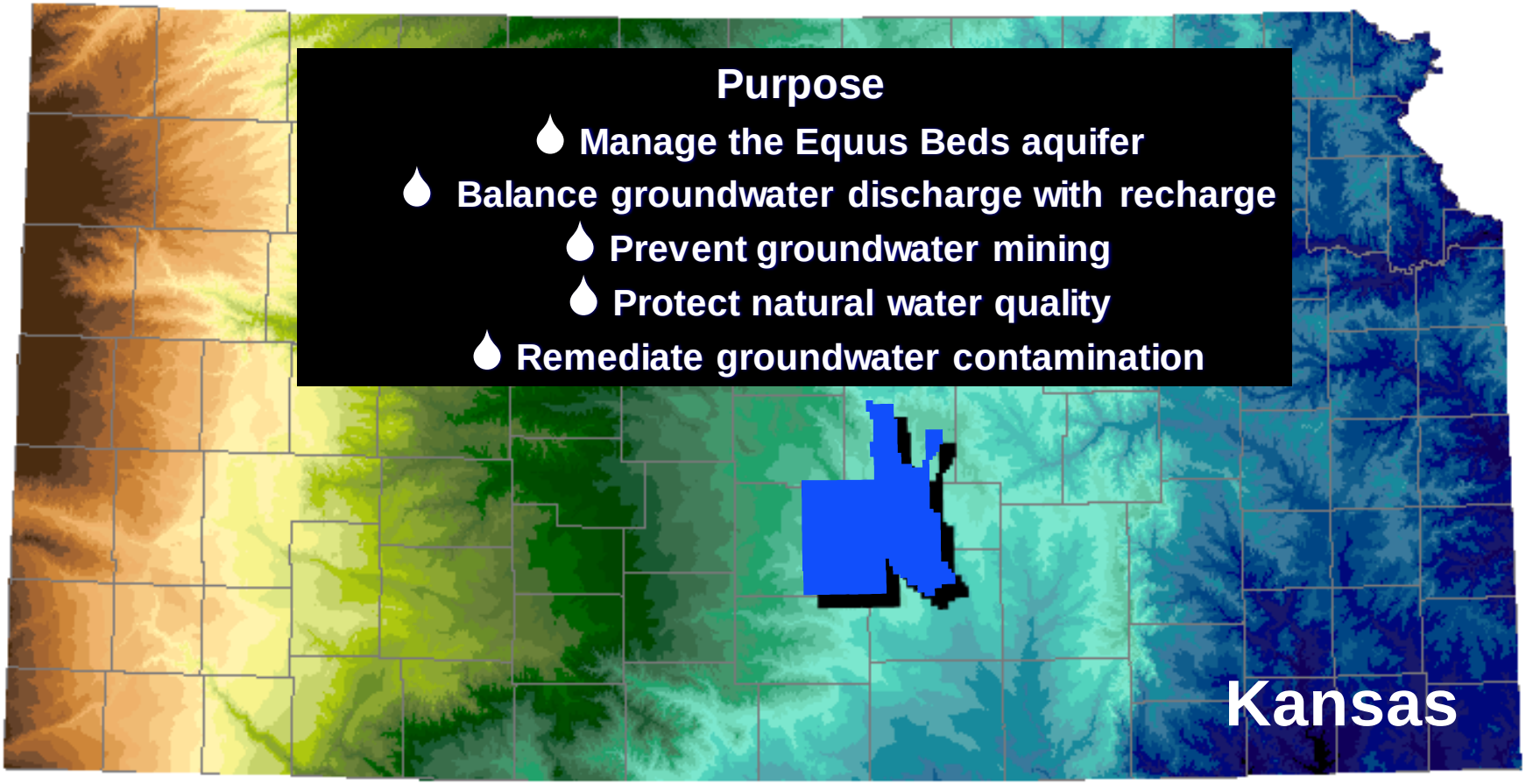
Extent of High Plains Aquifer in Kansas



Little or no saturated thickness
Missing aquifer due to outcrop of older rocks
Some saturated thickness
Arkansas River alluvium

Equus Beds Groundwater Management District

Established 1975

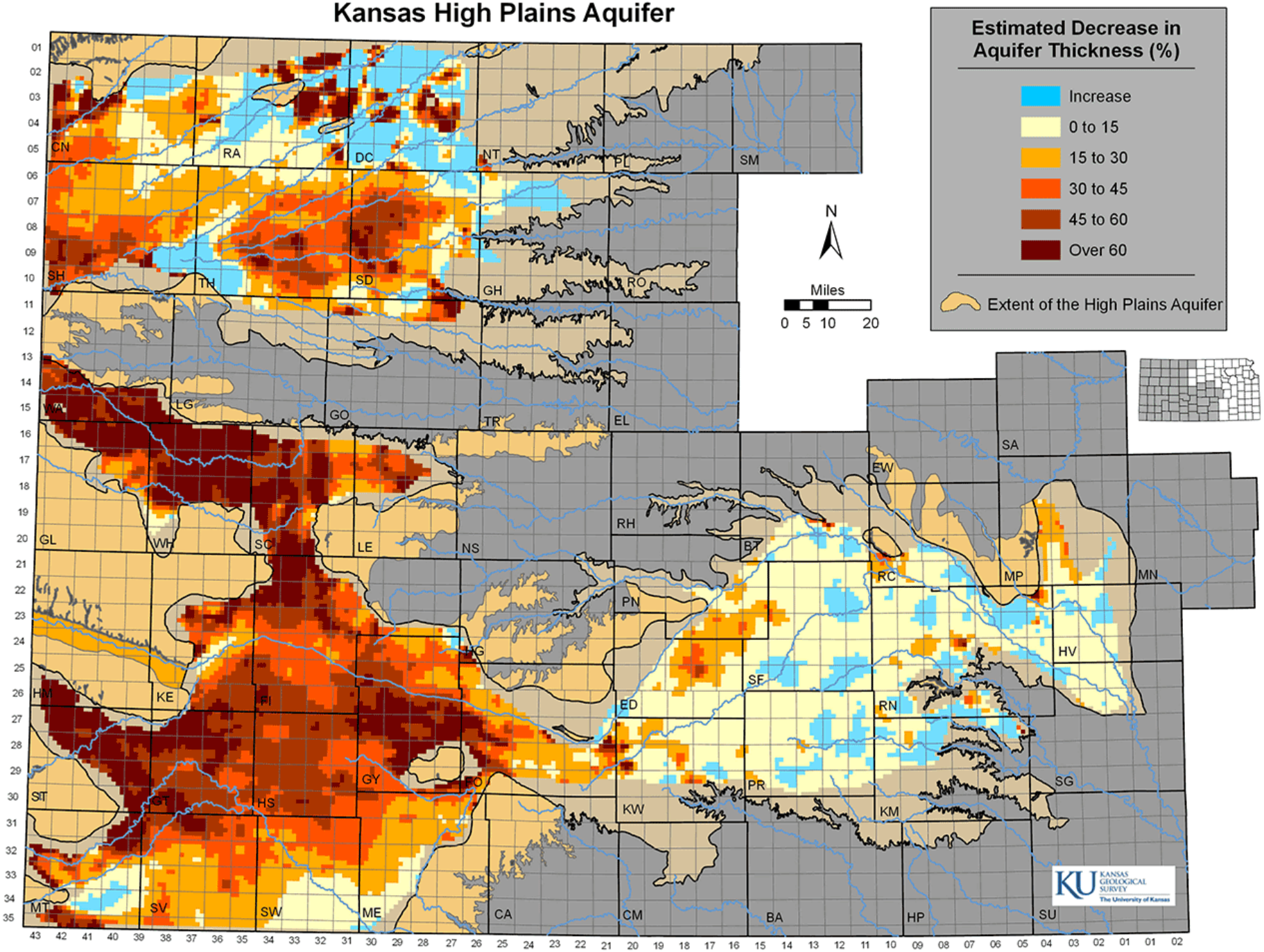


Purpose

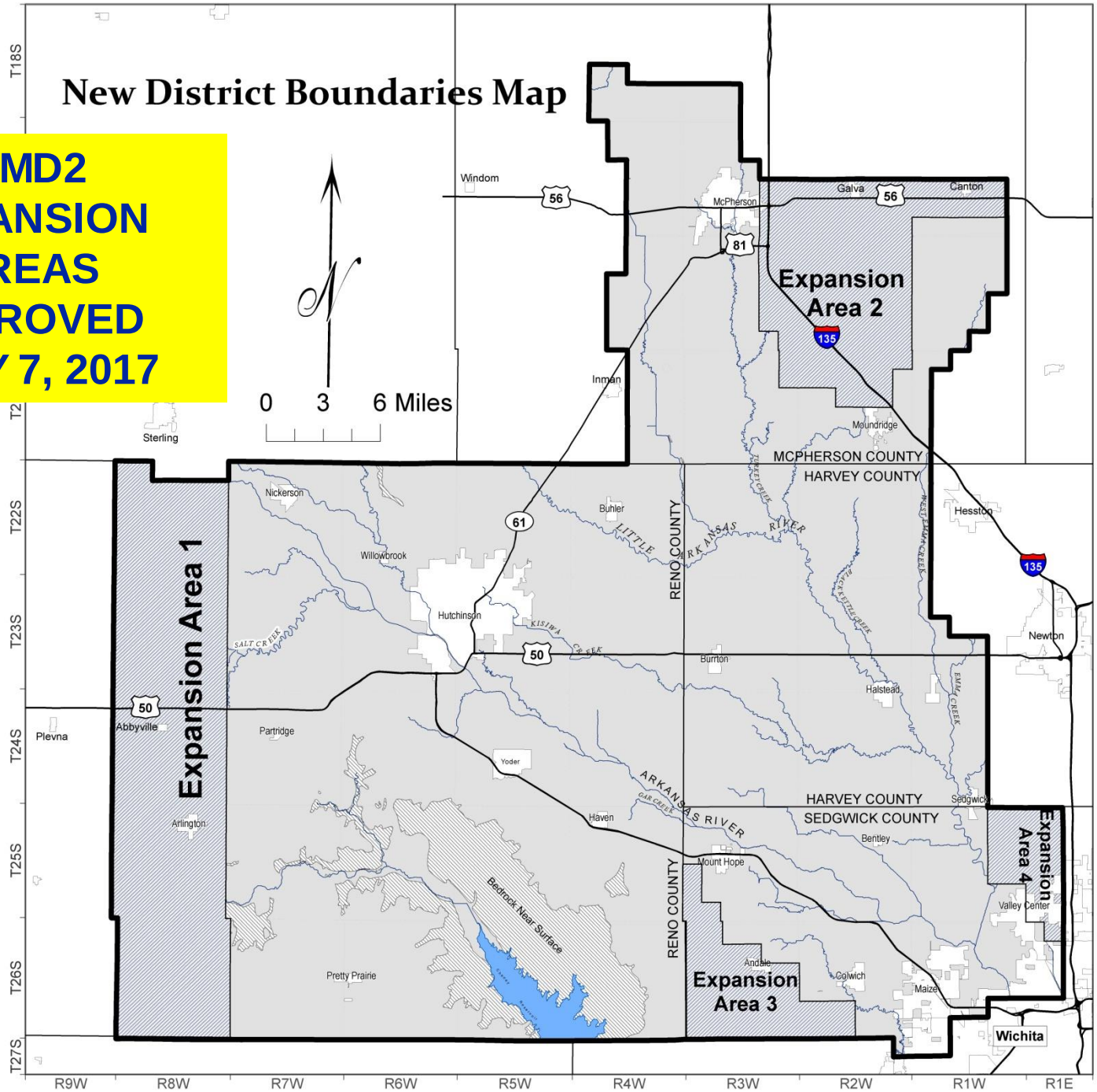
- Manage the Equus Beds aquifer
- Balance groundwater discharge with recharge
- Prevent groundwater mining
- Protect natural water quality
- Remediate groundwater contamination

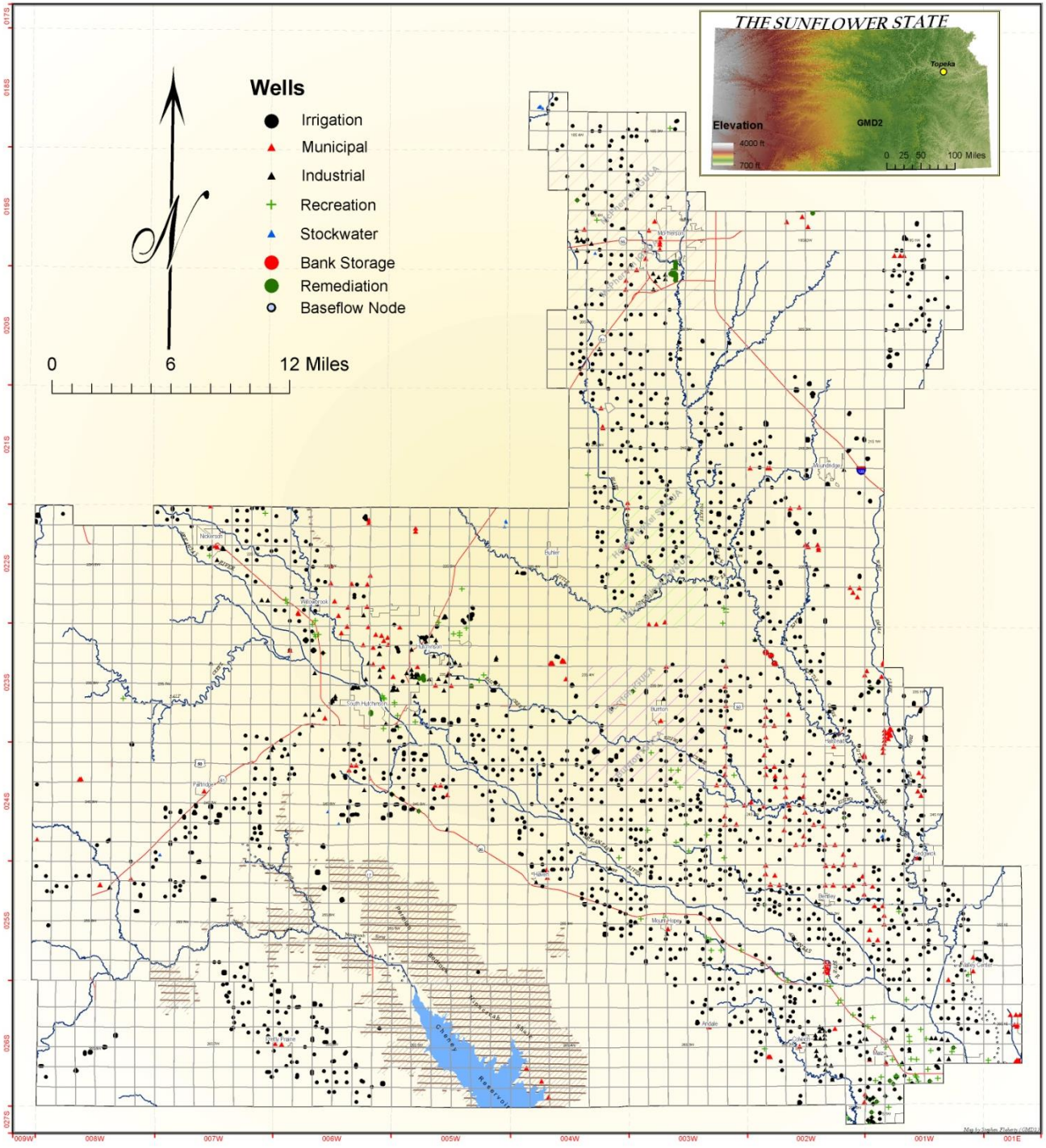
Location - South-central Kansas (Reno, Harvey, McPherson & Sedgwick Counties)

Percent Change in Aquifer Thickness, Predevelopment to Average 2015-2017, Kansas High Plains Aquifer



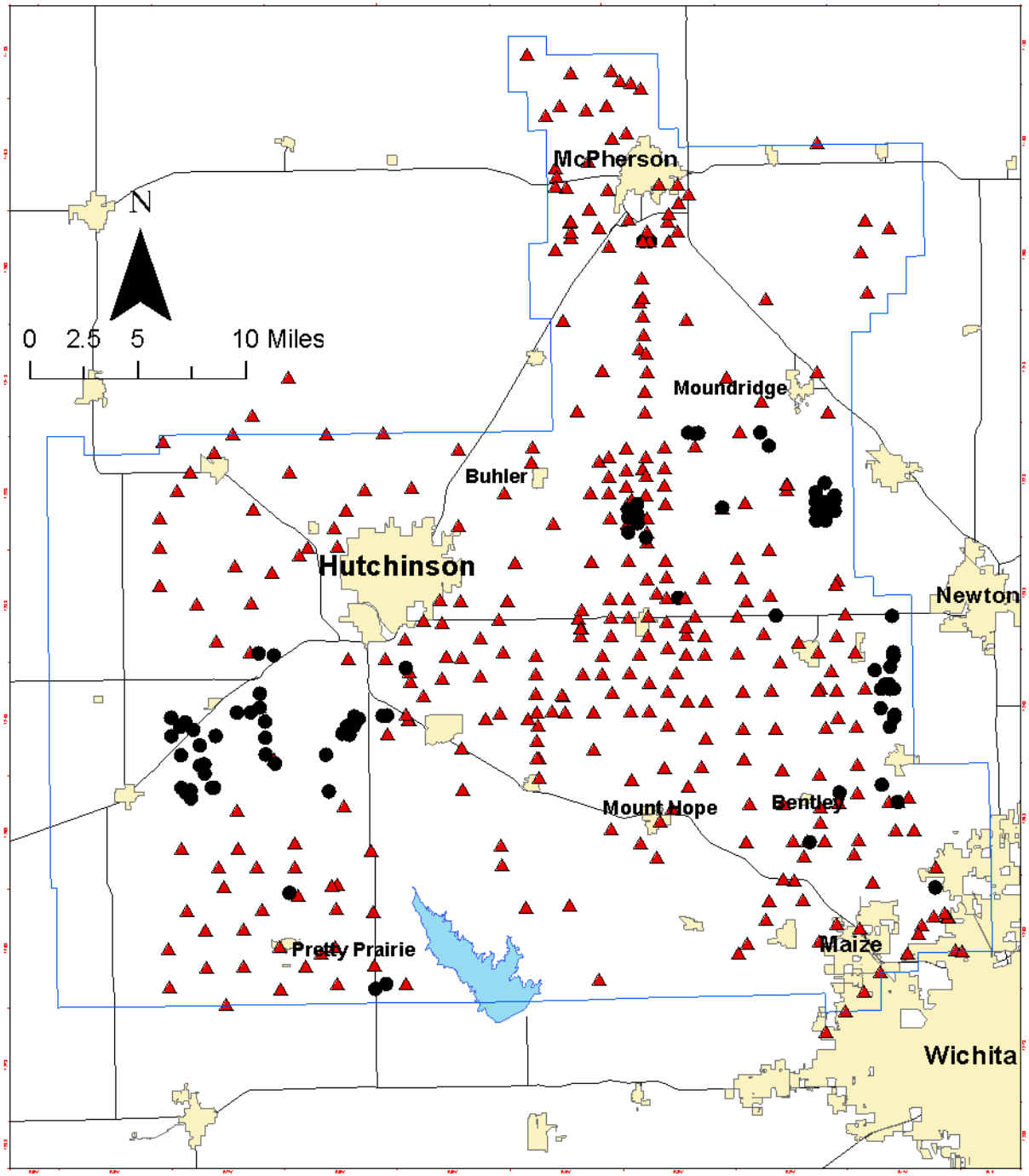
GMD2 EXPANSION AREAS APPROVED JULY 7, 2017





Kansas Geological Survey, Water Information Management and Analysis System (WIMAS) for the Web, http://hercules.kgs.ku.edu/geohydro/wimas

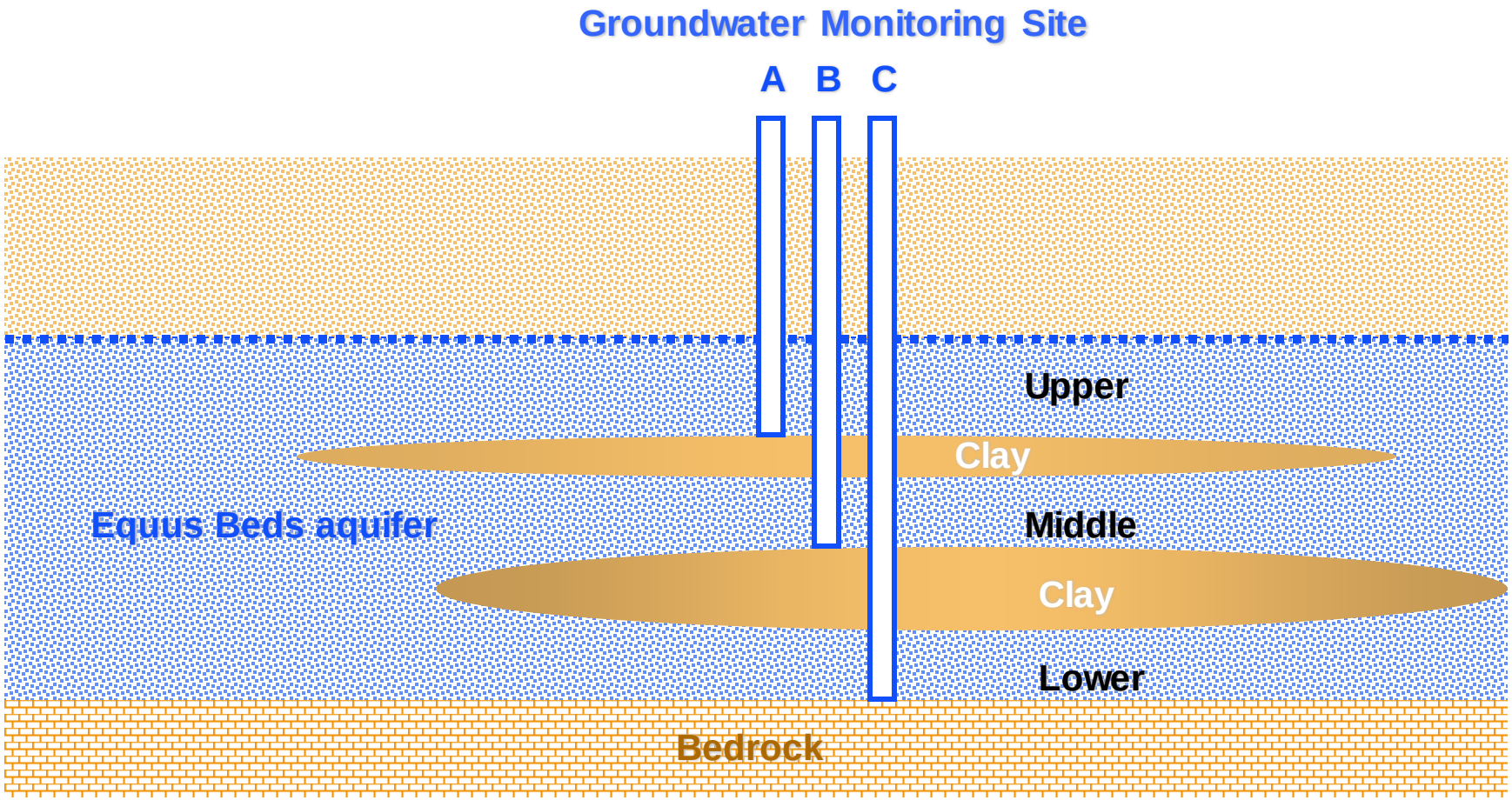
Equus Beds Groundwater Management District No. 2 Groundwater Monitoring Site Map



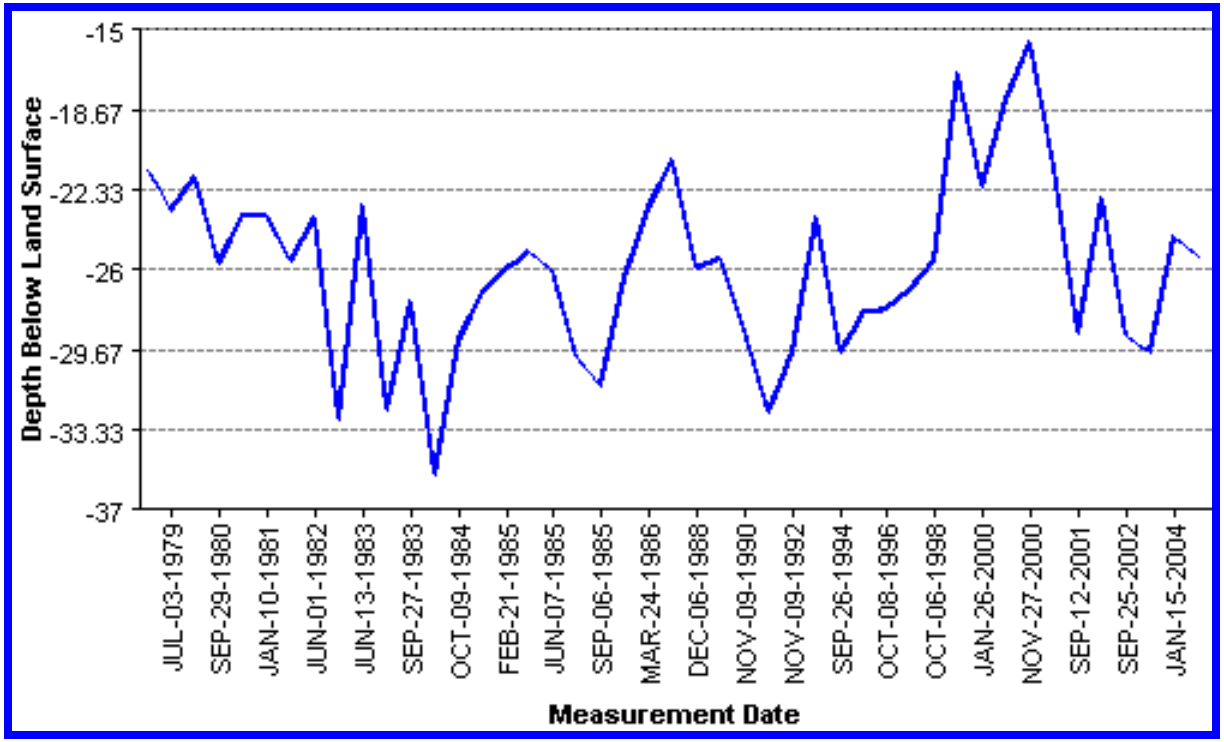
Monitoring Site

- # GMD2 Owned
- • Other Measured

Equus Beds Groundwater Management District
Groundwater Quality Monitoring Network



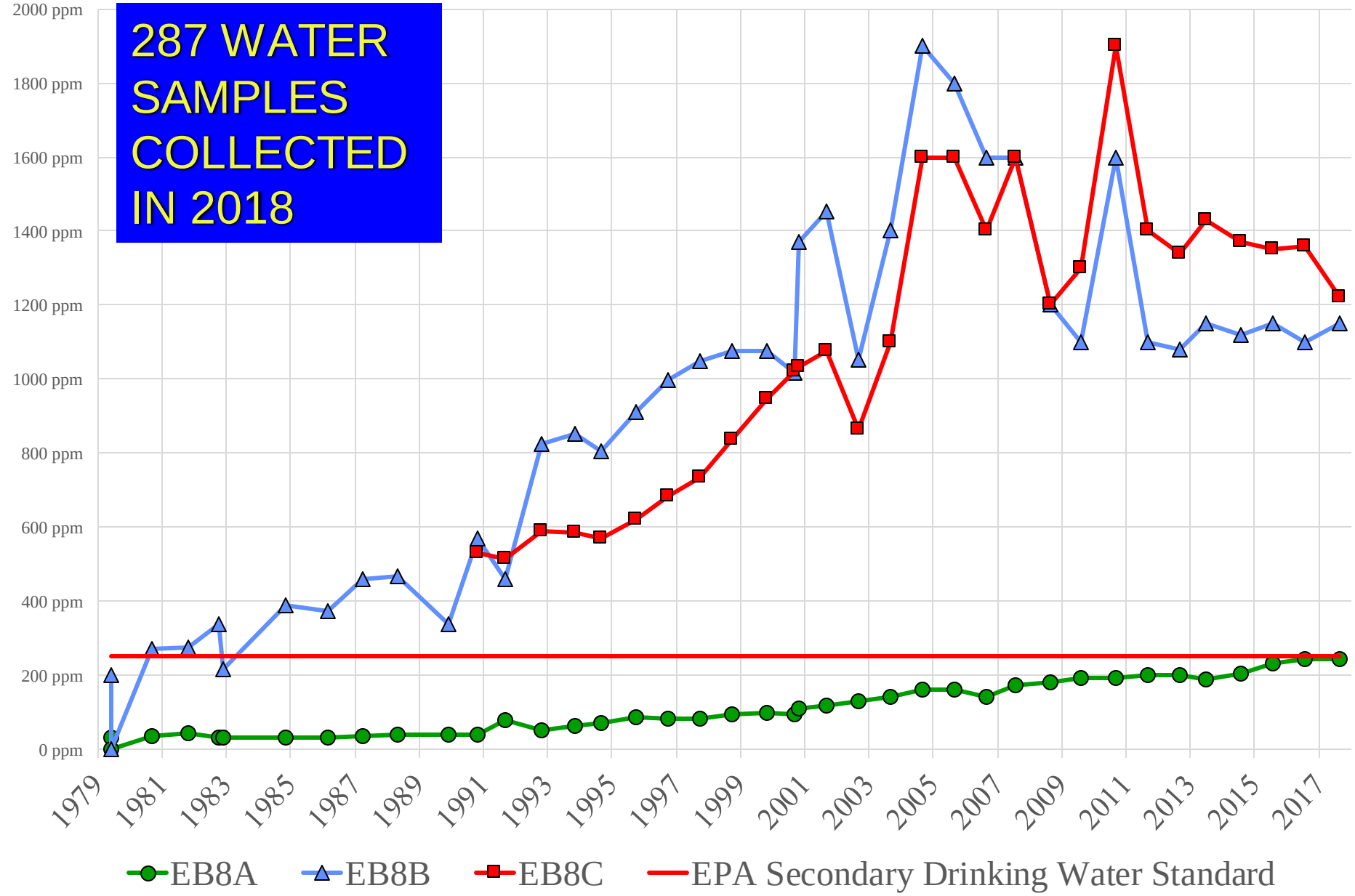
~2,900 WATER LEVEL MEASUREMENTS



Water level data on-line at

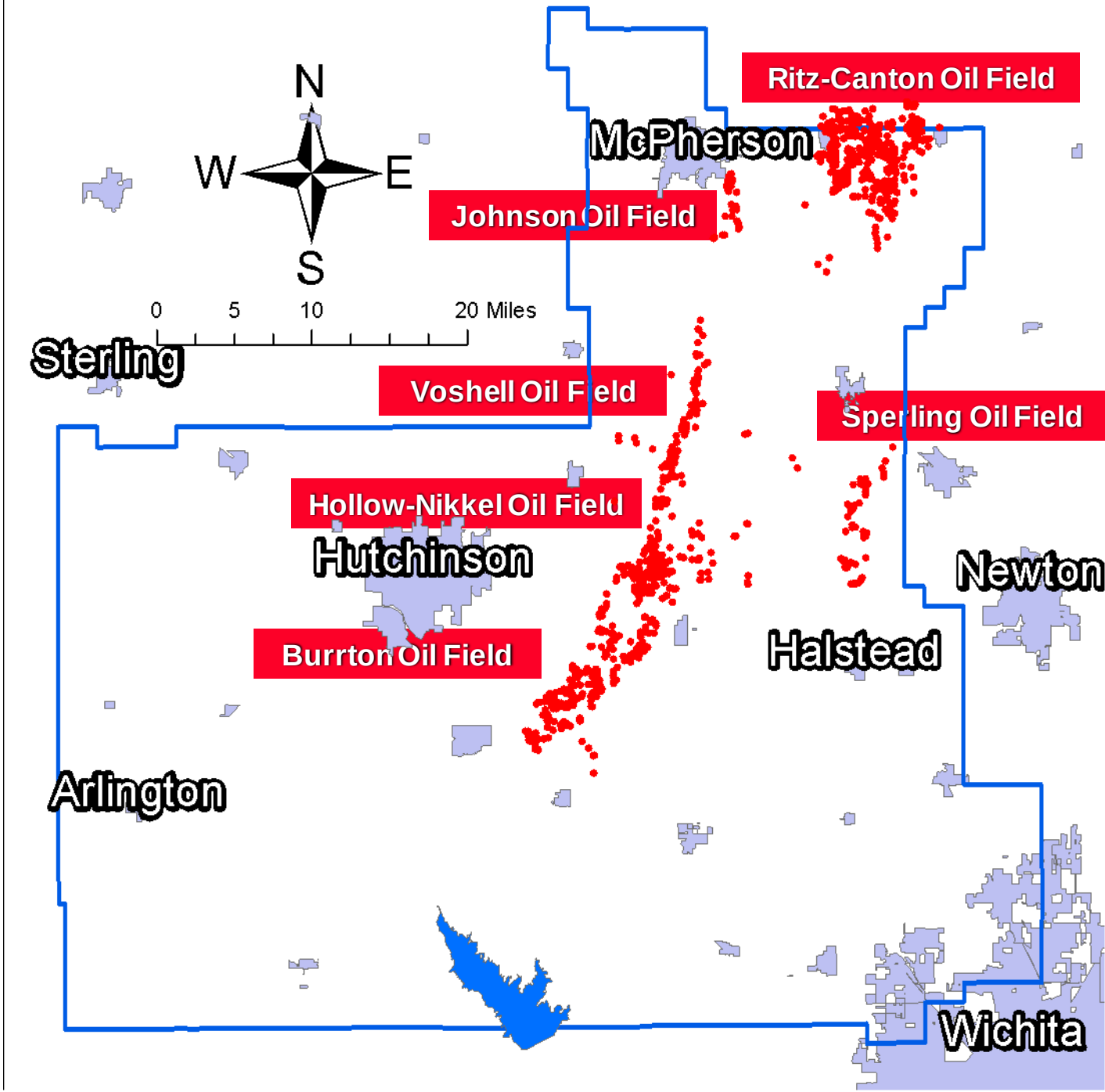
http://magellan.kgs.ukans.edu/WaterLevels/index.html

Chloride Concentration at Observation Wells
EB8A (38 ft bls), EB8B (130 ft bls), and EB8C (210 ft bls)

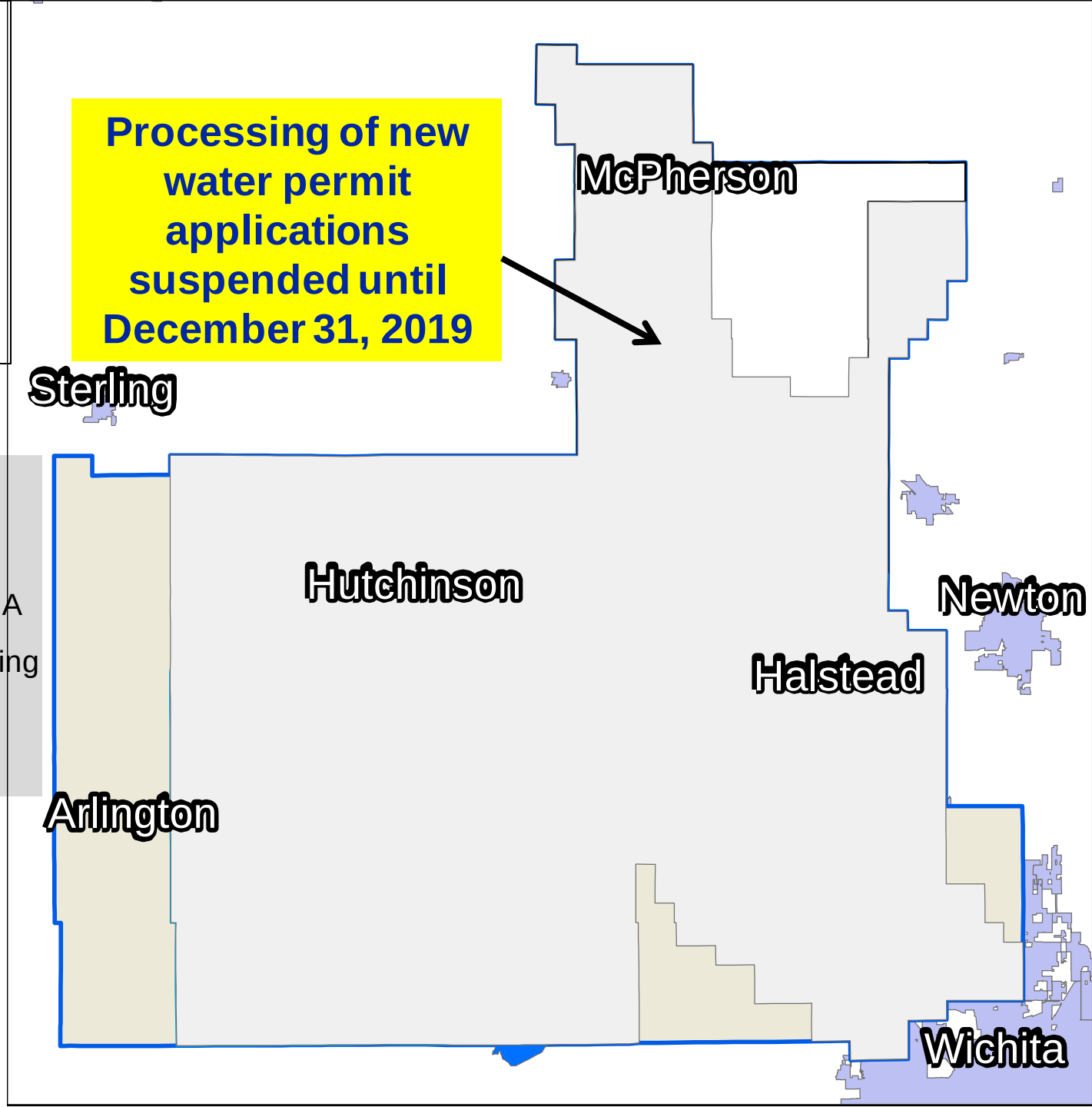


Equus Beds Groundwater Management District No. 2 Groundwater

Oil Field Brine Contamination Sites



Equus Beds Groundwater Management District No. 2 Special Management Areas



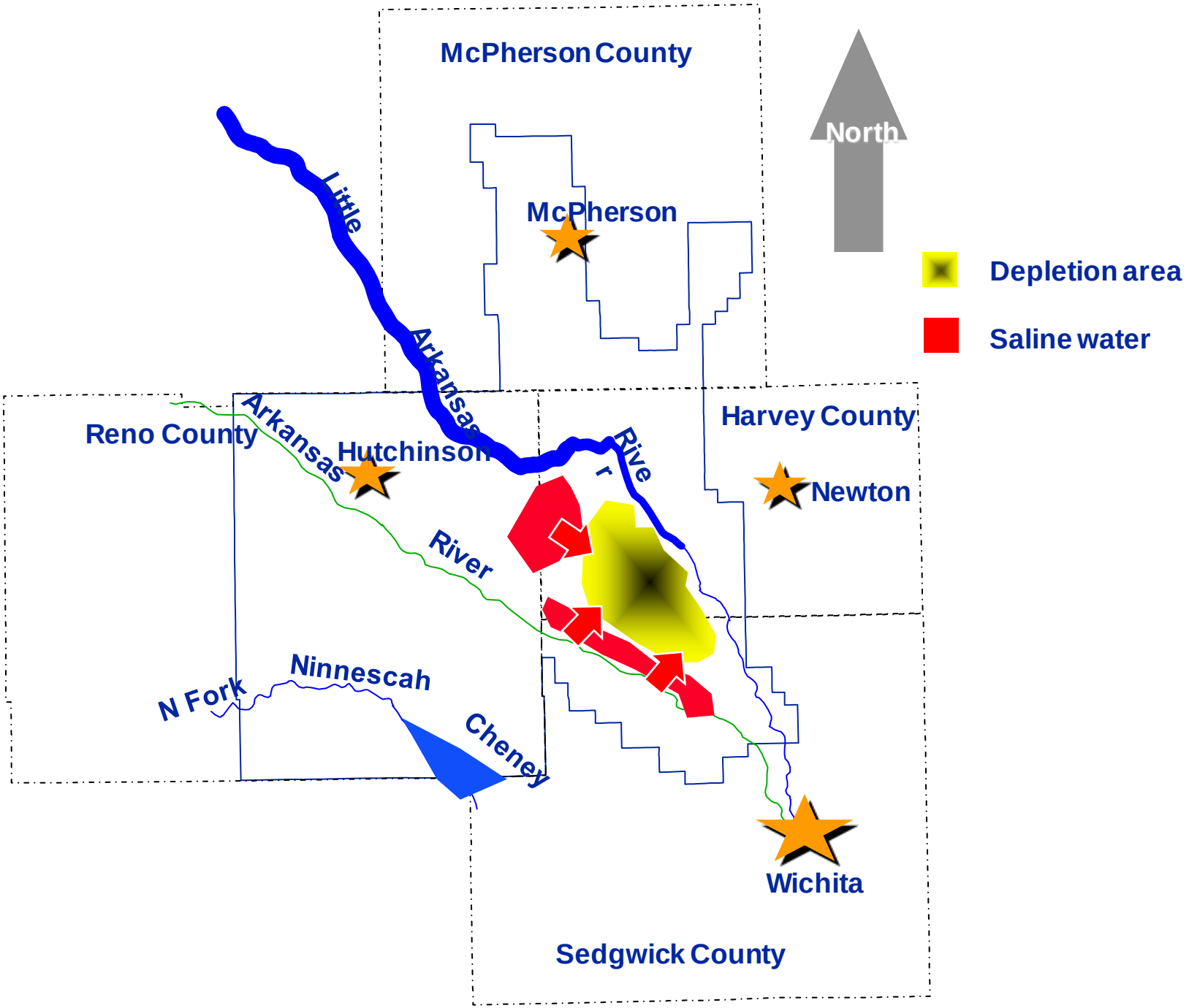
Legend

- McPherson IGUCA
- Hollow Nikkel SQWUA
- Enhanced Well Spacing
- Burrton IGUCA
- Suspension Area

Groundwater Management Issues

Aquifer Storage and Recovery

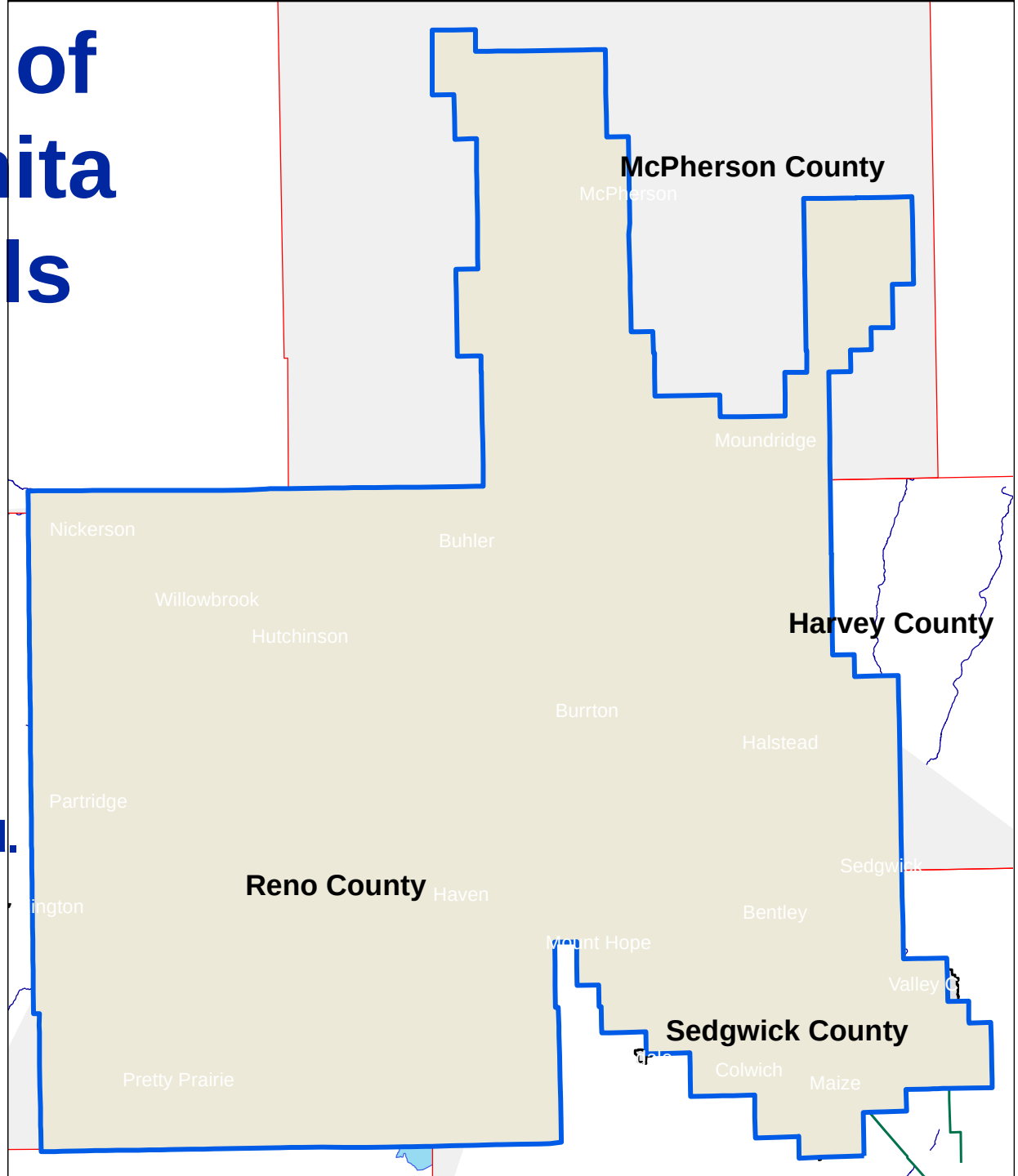
(groundwater recharge)


McPherson County
North
Depletion area
Saline water
McPherson
Little
Arkansas
River
Harvey County
Reno County
Hutchinson
Newton
Arkansas
River
Ninnescah
N Fork
Cheney
Wichita
Sedgwick County

City of Wichita Wells

55 Wells
40,000 AF/Y.

City Well Field area is over-appropriated. No new permits are allowed.



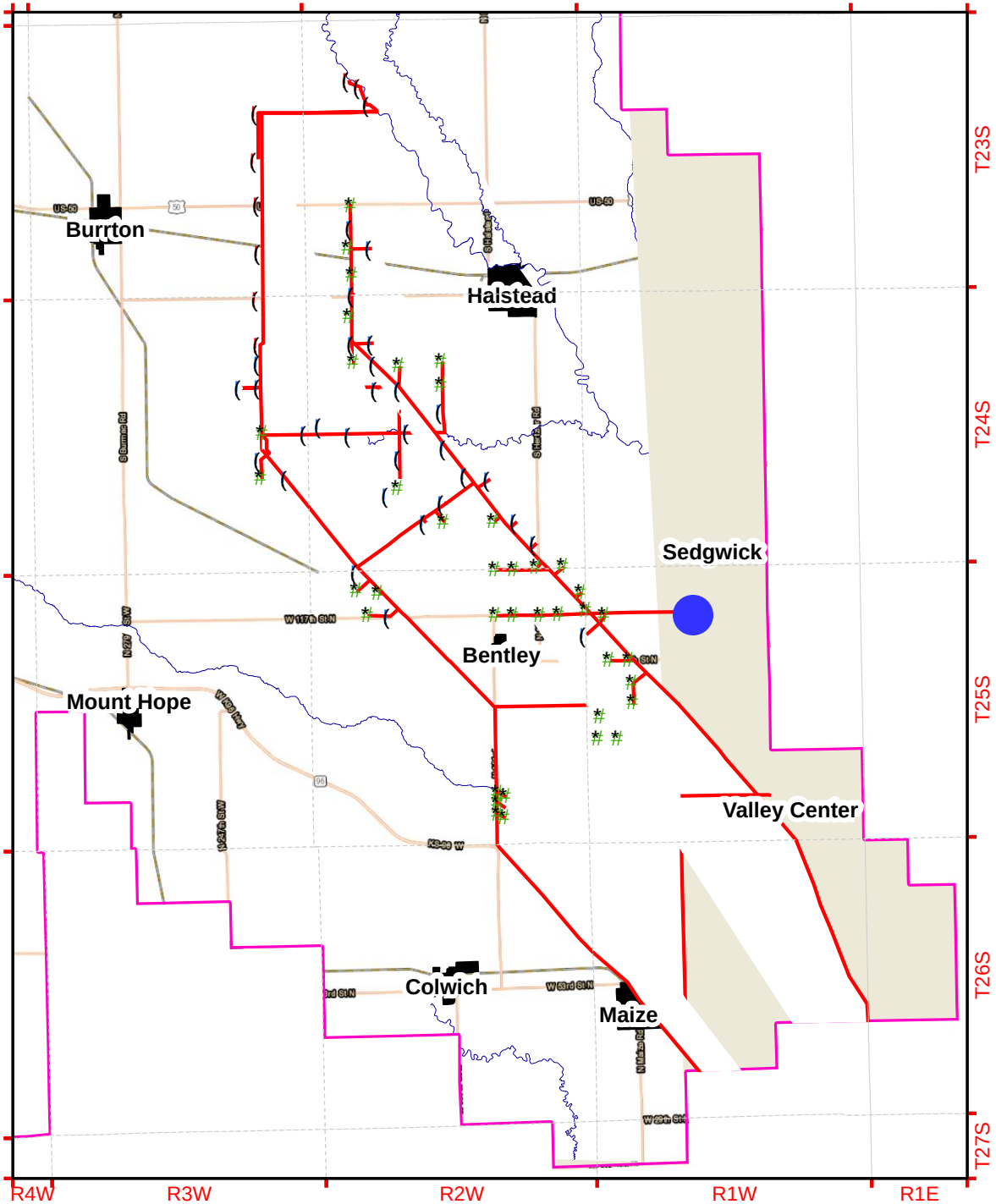
Diversions and Projections

Red Circle = Phase 1:
3 bank storage wells & 6 injections sites

Blue Circle = Phase 2:
30 MGD surface intake and 30 injection sites

Green Triangle = other City wells

Red Line = ASR pipeline



ASR REGULATIONS & PERMIT CONDITIONS

- **Injection Permits - KDHE**
- **Water Permits –DWR and GMD2**
- **Accounting**
- **Monitoring**

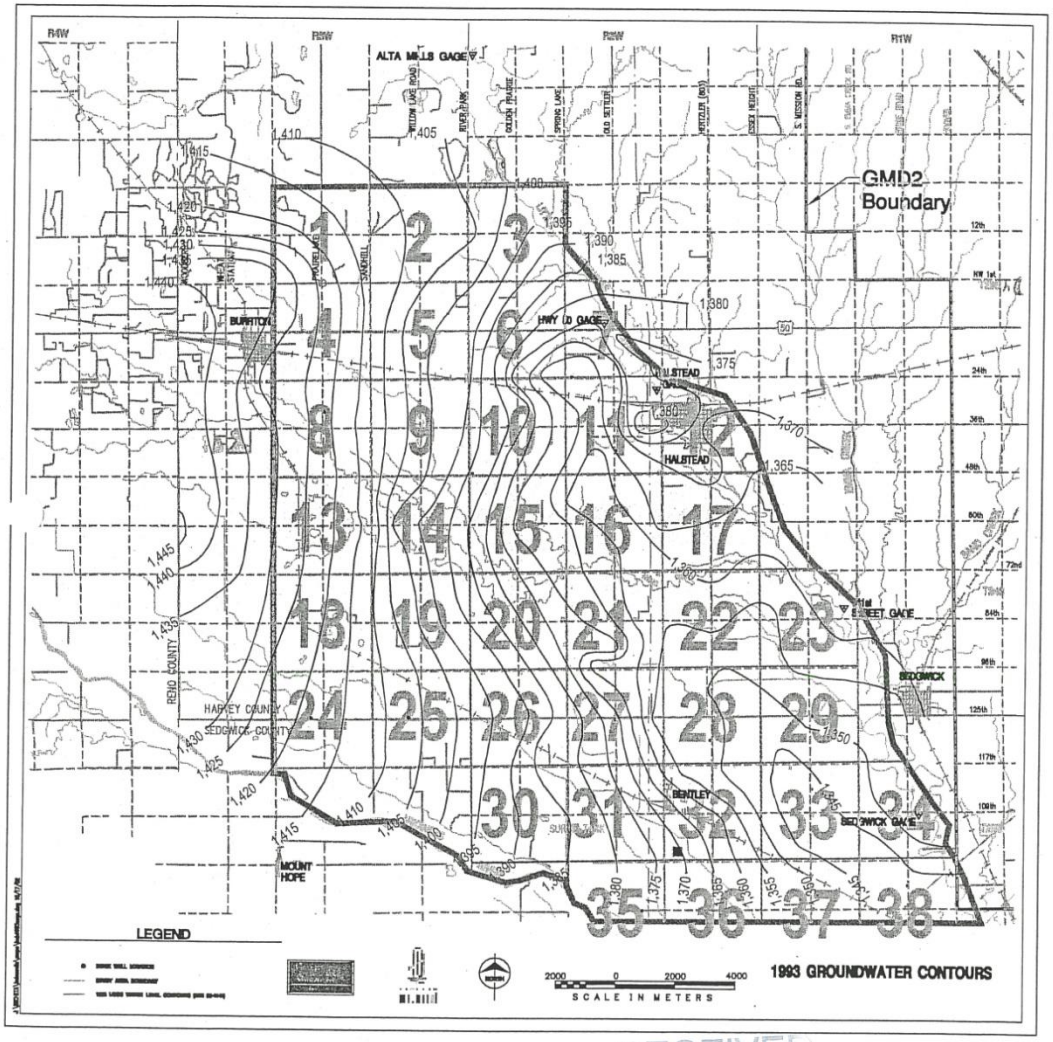
ASR REGULATIONS & PERMIT CONDITIONS

- **Determine Vertical and Horizontal Extent of the Basin Storage Area**
- **Describes where recharge water can be stored and under what conditions recharge credits can be recovered (pumped)**
- **Horizontal Extent – See map**

Basin Storage Area and Index Cells

Attachment 2

WATER RESOURCES
RECEIVED
DEC 1 6 2003
KS DEPT OF AGRICULTURE



RECEIVED
AUG 1 1 2005
QUUS BEDS GROUNDWATER
MANAGEMENT DISTRICT NO.
MICROFILMED
WATER RESOURCES
RECEIVED
JUL 0 3 2003
KS DEPT OF AGRICULTURE
MICROFILMED

ASR REGULATIONS & PERMIT CONDITIONS

- **Vertical Extent of the Basin Storage Area.**
- **Top is 1940 groundwater level or 10 feet below land surface. City can't recharge above this level.**

ASR REGULATIONS & PERMIT CONDITIONS

- **Bottom is Winter 1992/January 1993 groundwater levels (minimum index levels). Can't pump recharge credits if groundwater level is below this, as measured in January of each year.**
- **Not applicable to the City of Wichita's normal water rights – no restriction.**

ASR REGULATIONS & PERMIT CONDITIONS

- **1993 groundwater levels chosen as bottom of the Basin Storage Area based on previous ASR Regulations.**
- **Previous Regulations required the bottom to be the lowest groundwater level 10 years prior to filing an ASR application (or longer period of time to represent the historically lowest groundwater level).**

ASR REGULATIONS & PERMIT CONDITIONS

- **1993 groundwater level represent the lowest measured static groundwater levels in the Wichita Well Field / Basin Storage Area.**
- **Groundwater levels have recovered significantly in the Wichita Well Field area largely due, until recently, to the City of Wichita pumping less groundwater and relying more on Cheney Reservoir.**

ASR REGULATIONS & PERMIT CONDITIONS

- **GMD2, DWR, and City of Wichita all agreed to the 1993 groundwater level benchmark for recharge credits recovery.**
- **Original water permit conditions presented to the public at meetings and public hearings when existing ASR Phase I and Phase II were being reviewed and approved.**

CHANGES TO ASR REGULATIONS

- **State-wide regulations provide how to determine the bottom water-level elevation**
- **Change requested by City of Wichita**
- **GMD2 opposed regulation change**
- **Modified regulation changed the bottom of a Basin Storage Area to 20 feet above bedrock or an alternative groundwater elevation.**

CHANGES TO ASR REGULATIONS

- **City of Wichita is concerned with being able to pump recharge credits in an extended drought if groundwater levels drop below the 1993 levels.**
- **Regulation modification did not automatically change the City of Wichita's ASR permit conditions.**

CHANGES TO ASR PERMIT CONDITONS

- **City of Wichita has submitted request to DWR to modify ASR water permit conditions and lower the minimum index levels between ~ 9 and 23 feet depending upon Index cell, thus allowing the City to pump recharge credits when the groundwater levels are lower than the current historic lowest levels (1993 water levels).**

CHANGES TO ASR PERMIT CONDITIONS

- **August 8, 2005 DWR ASR Initial Order contained the conclusion by the then Chief Engineer that the public interest is protected by not withdrawing recharge credits when the static water level is below the 1993 level.**

CHANGES TO ASR PERMIT CONDITIONS

- **The conclusion that the public interest is protected by not withdrawing recharge credits when the static water level is below the 1993 level was incorporated as conditions of both the August 8, 2005 ASR Phase I Order signed by the former Chief Engineer, and the September 18, 2009 ASR Phase II Order signed by the current Chief Engineer.**

CHANGES TO ASR PERMIT CONDITONS

- **City of Wichita has also submitted request to DWR to allow the accumulation of groundwater recharge credits without actually physically injecting treated surface water into the aquifer.**

CHANGES TO ASR PERMIT CONDITONS

- **Groundwater recharge credits called Aquifer Maintenance Credits (AMCs) would be allowed to be accumulated by pumping treated surface water from the Little Arkansas River directly to the City for municipal use during times of limited recharge capacity, rather than physically injecting the source water into the aquifer,which is currently required to develop recharge credits.**

CHANGES TO ASR PERMIT CONDITONS

- **Passive recharge credits are prohibited pursuant to the existing ASR approval orders.**
- **The City and the current Chief Engineer, DWR, contend that AMCs are not passive recharge credits.**

CHANGES TO ASR PERMIT CONDITONS

- **GMD2 had four experts review the City's requests.**
- **GMD2 Expert reports found, in part:**
  - **AMCs are passive recharge credits and therefore prohibited.**
  - **AMCs are not consistent with and not allowed by current Kansas water laws and regulations.**

CHANGES TO ASR PERMIT CONDITONS

- **GMD2 Expert reports found, in part:**
  - **Negative impact to the aquifer, other groundwater users, streamflow, and saltwater contamination movement is possible and is not adequately addressed in the City's proposal.**

CHANGES TO ASR PERMIT CONDITONS

- **GMD2 Board of Directors by approved motion on February 19, 2019, opposes the City's ASR Permit Modification Proposal**
- **Formal Hearing on December 10-12, 2019, in Halstead**
- **Public comments received from 9:00 AM to 11:00 AM on December 13 only**

CHANGES TO ASR PERMIT CONDITONS

- **More information available on DWR ASR webpage:**

http://www.agriculture.ks.gov/WichitaASR.