

Quivira Impairment Remedy Requirements

GMD 5 annual meeting
February 15, 2018

David Barfield, Chief Engineer

Division of Water Resources
Kansas Department of Agriculture



Rattlesnake Basin and Quivira National Wildlife Refuge

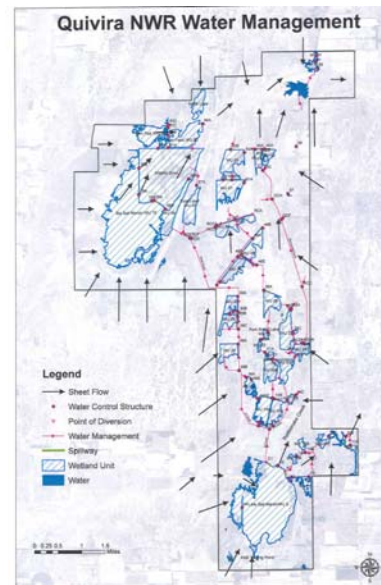
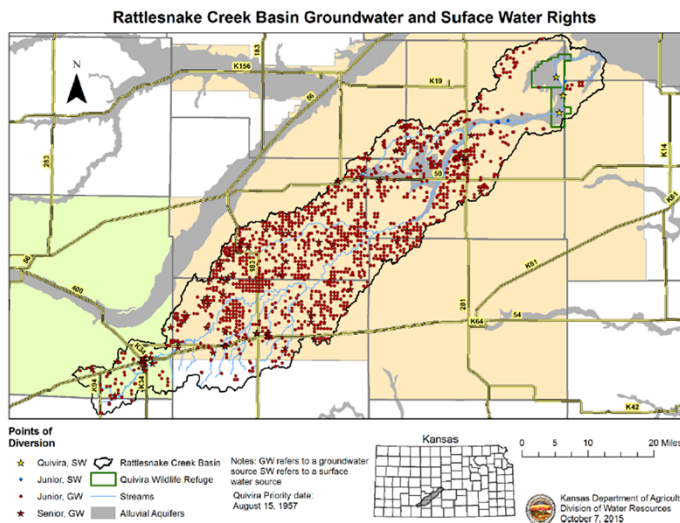
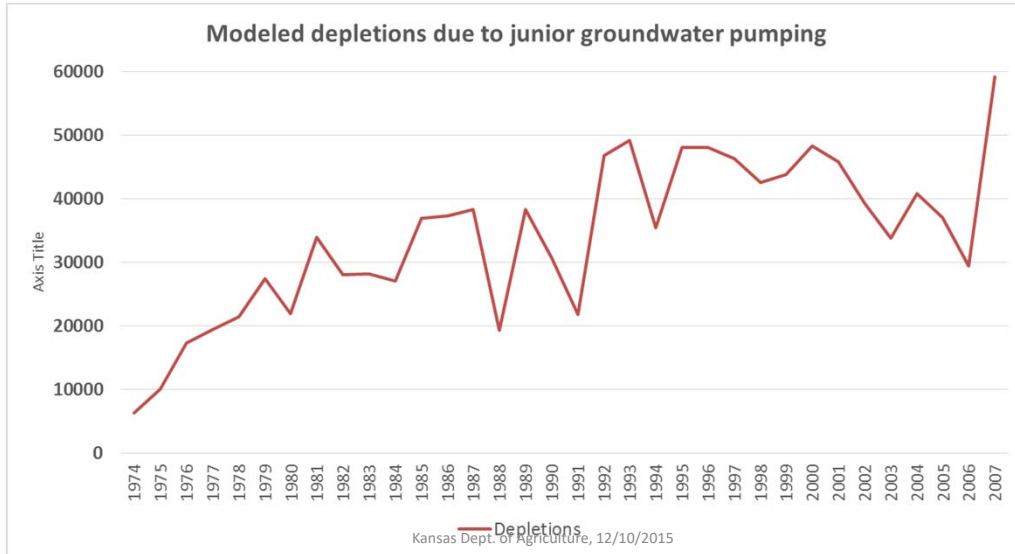


Figure 2 - Rattlesnake Creek Basin map of water rights

Groundwater depletions to streamflow as determined using the GMD 5 groundwater model





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Quivira National Wildlife Refuge Impairment Complaint

The U.S. Fish and Wildlife Service (Service) owns and operates the Quivira National Wildlife Refuge (Quivira), a wetland of international significance and part of the central U.S. flyway. Water is a critical component of its operations.

The Service's water right for Quivira has a priority that dates back to 1957 and is located at the lower end of the Rattlesnake Creek basin, within GMD No. 5. The Service's water right at Quivira allows it to divert up to 14,632 acre-feet per year at a maximum rate of 300 cubic feet per second (cfs).

After decades of voluntary efforts to resolve its concerns were unsatisfactory, the Service filed an impairment complaint with KDA-DWR in April of 2013. KDA-DWR then began its investigation of the alleged impairment.

KDA-DWR published an initial impairment investigation report on December 2, 2015. The initial report analyzed historical records and evaluated the effects that junior groundwater pumping have had on Quivira's water supply using the GMD No. 5 groundwater model. The analysis indicates that junior groundwater pumping has impaired the Service from exercising its senior water right for Quivira. The initial report and related documents are available through the links below. As supplemental information is available, it will be posted here.

No water administration will occur in 2016. Concurrent with the review of the initial report, KDA-DWR will work with Basin stakeholders to develop and evaluate alternatives to address resource problems identified by the initial report. The basin plan is tentatively due to the chief engineer for review by August 15, 2016.

The impairment investigation progress and tentative plan is outlined at the bottom of this page.

SUPPORT FILES TABLE

Development of Impairment Remedy

Description	Document File	File Size	Date Posted	Provided by
Draft LEMA proposal (February 2016)	Draft LEMA Proposal	7 MB	2/14/2016	GMD
Rattlesnake Creek Streamflow Response Regions, version 5 with cities and highways (2/14/2016)	Rattlesnake Creek Response Map with landmarks	4 MB	2/15/2016	DWR
Improved irrigation/pumping relationship (1/9/2016)	Improved irrigation/pumping relationship (Attachments)	Multiple	1/9/2016	DWR
KDA letter to GMD No. 5 regarding 2016 water administration, expectations for a remedy and calling for a public meeting (12/13/2017)	KDA letter to GMD	184 KB	1/9/2016	DWR
Rattlesnake Creek Streamflow Response Regions, version 5 (11/16/2017)	Rattlesnake Creek Response Map	2 MB	2/6/2016	DWR
Follow-up on questions from 11/10/2017 meeting (11/16/2017)	Follow-up on 11/10/2017 meeting	86 KB	1/9/2016	DWR
Modeling work to refine Zone A (version 4)(11/9/2017)	Modeling work to refine Zone A (version 4)	1 MB	1/9/2016	DWR
Correspondence regarding draft "backstop" control provision options (10/20/2017)	Correspondence regarding draft control provision options (Attachments)	Multiple	1/9/2016	DWR
DWR request of data from GMD No. 5 related to end uses and modeling work (10/19/2017)	end use and modeling work data request	126 KB	1/9/2016	DWR
Second letter of comment from Alan and Rachel Crane (9/29/2017)	Crane comments	3 MB	10/2/2017	Crane
DWR response to letter from Audubon of Kansas (9/29/2017)	DWR Response to Audubon of Kansas	196 KB	10/2/2017	DWR
Outline of LEMA plan elements needed to address impairment (8/30/2017)	LEMA plan elements outline	132 KB	1/9/2016	Audubon of Kansas
Letter of comment from the Audubon of Kansas regarding the impairment negotiations (8/4/2017)	Audubon of Kansas comments	375 KB	9/14/2017	Audubon of Kansas
Letter of comment from Alan and Rachel Crane regarding the impairment remedy and Mystery River Basin (8/30/2017)	Crane comments	4 MB	9/27/2017	Crane

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National Wildlife Refuge <http://agriculture.ks.gov/divisions-programs/dwr/water-appropriation..>

GMD No. 5 LEMA Proposal outline (8/11/2017)	GMD5 LEMA Proposal outline	19 KB	8/17/2017	GMD No. 5
Email explaining work to develop revised response regions map (8/7/2017)	Response map revision notes	1.0 MB	8/17/2017	DWR
Rattlesnake Creek Streamflow Response Regions (revised 8/4/2017)	Rattlesnake Creek Response Map (Superseded 11/16/2017)	2.7 MB	8/17/2017	DWR
DWR to GMD No. 5, additional explanation on Quivira slides (7/13/2017)	Additional explanation on Quivira slides	196 KB	1/9/2016	DWR
KDA DWR presentation on remedy requirements beyond augmentation (draft analysis) (7/6/2017)	DWR Presentation (July 2017)	2.0 MB	8/17/2017	DWR
DWR modeling work related to effect of varying level of pumping restrictions in two zones (8/19/2017)	Model work (June 2017)	135 KB	1/9/2016	DWR
Fish and Wildlife Service response to GMD No. 5 second proposal (3/22/2017)	Service response to second proposal	660 KB	4/19/2017	Service
GMD No. 5 Second Proposal (2/15/2017)	GMD No. 5 second proposal	5.4 MB	2/17/2017	GMD No. 5
Service conditions on potentially acceptable solutions (12/13/2016)	Conditions for solution	156 KB	12/19/2016	Service
DWR letter to GMD No. 5 regarding Service response (12/13/2016)	DWR to GMD No. 5	154 KB	12/8/2016	DWR

Developing a remedy

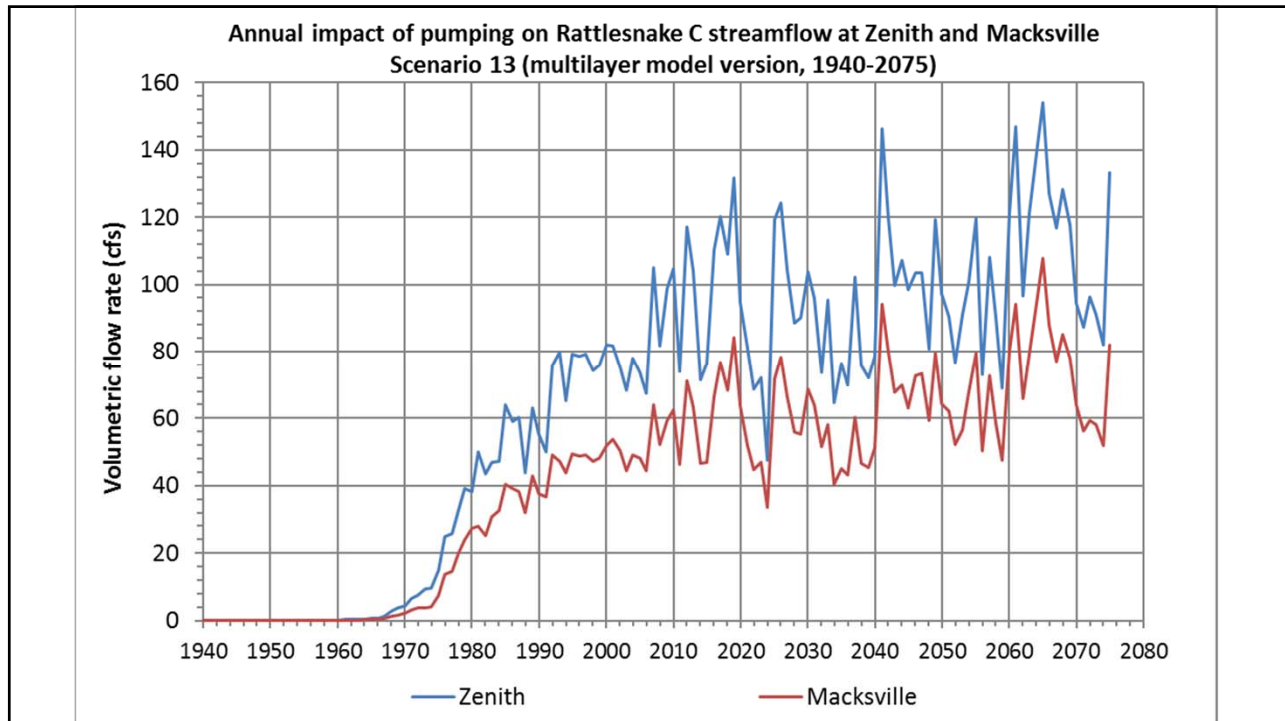
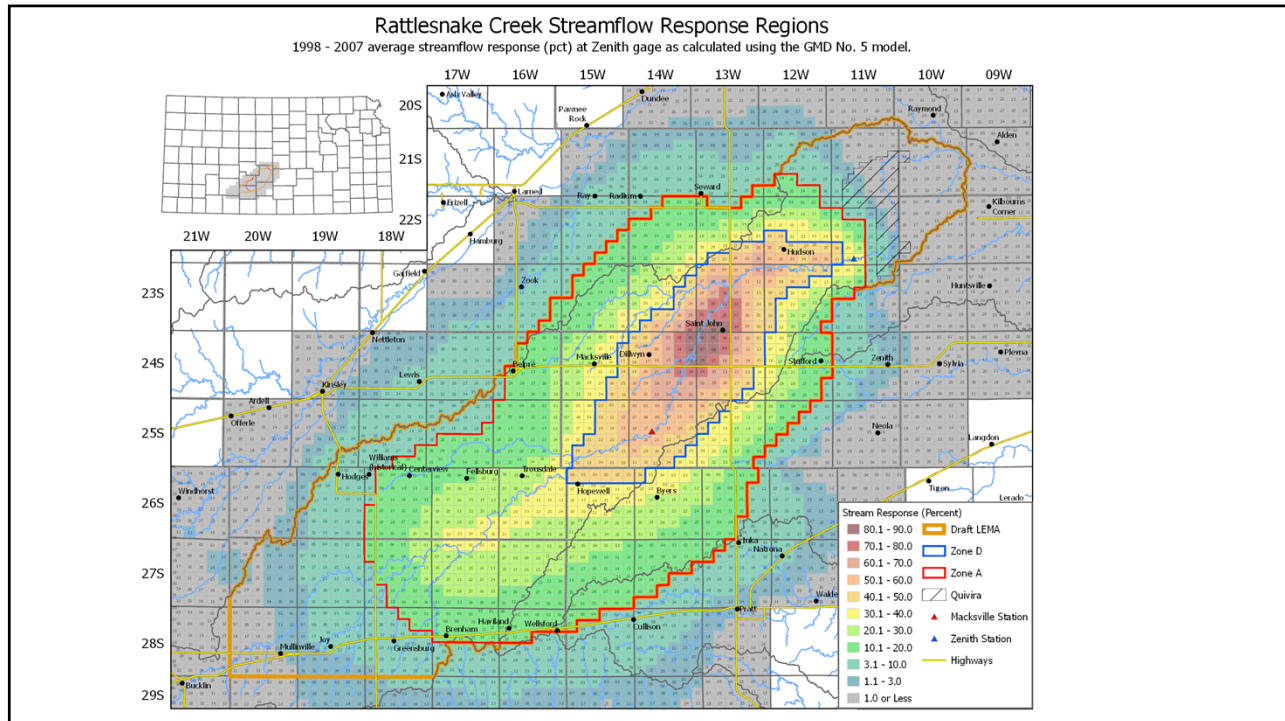
- While KDA-DWR did not develop a remedy in our impairment investigation, our modeling and impairment analysis suggests the following:
 - Due to the limited amount of pumping near the stream and lag-time between pumping shutoffs and stream benefits, “real-time administration” will not be sufficient to prevent impairment.
 - The plan will likely need to include long-term cuts in groundwater pumping to address the upward trend in depletions.
 - Augmentation can be used to reduce the need for the long-term pumping cuts

Tools to remedy impairment

- Augmentation. This cannot be ordered, the Basin must bring it.
- Long-term pumping reductions. This can be accomplished via:
 - water right administration,
 - an Intensive Groundwater Use Control Area (IGUCA), or
 - a Local Enhanced Management Area (LEMA)
- A combination of augmentation and pumping reductions

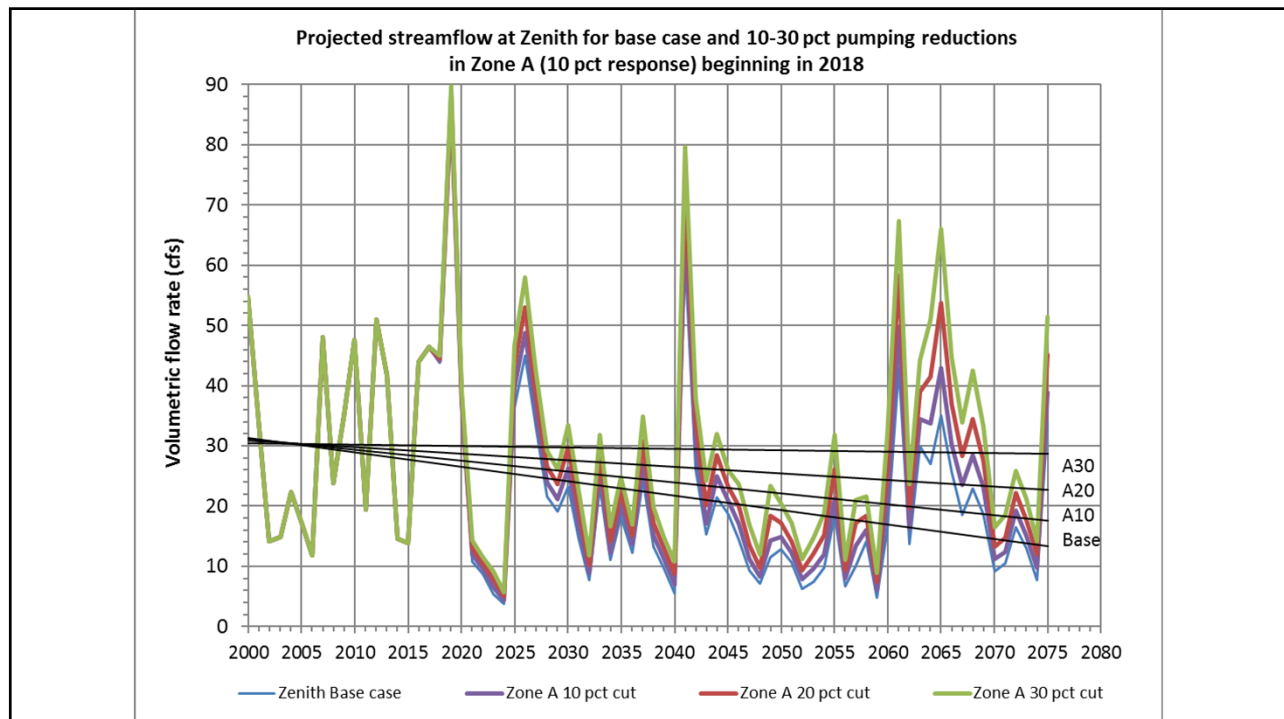
Negotiations seeking a Remedy

- GMD 5 provided two offers to the U.S. Fish and Wildlife Service (Service) to settle the matter but were unable to reach agreement.
- The Service indicated that augmentation could be an acceptable part of the solution if the quantity and quality are sufficient, but that some level of pumping reductions is needed to make the plan sustainable over the longer term.
- With the inability to reach agreement with the Service, GMD asked what DWR would require to resolve the impairment.
- DWR completed additional technical work to provide a preliminary answer to the question, presented in July 2017



What level of pumping reductions would be required to stabilize the streamflow depletions?

- We reviewed the benefit of pumping reductions of 10, 20 and 30% within two zones.
 - **Zone A** – area of 10% or greater long-term impact (approx. 135,000 acres with 160,000 AF of average pumping).
 - 10% reduction, averaging 16,000 AF (13,500 AF net pumping)
 - 20% reduction, averaging 32,000 AF (27,000 AF net pumping)
 - 30% reduction, averaging 48,700 AF (40,700 AF net pumping)
 - **Zone B** – area of 20% or greater long-term impact (approx. 85,000 acres with 100,000 AF of average pumping).
 - 10% reduction, averaging 10,000 AF (8,500 AF net pumping)
 - 20% reduction, averaging 20,000 AF (17,000 AF net pumping)
 - 30% reduction, averaging 30,000 AF (25,500 AF net pumping)



Draft Proposal to remedy impairment to QNWR, July 2017

- **Zone A** is the area of 10% or greater long-term impact (approx. 135,000 acres)
- An immediate 15% reduction in pumping in Zone A for 5 years, 2018-2022.
 - Provided as a 5-year allocation, in inches per acre, with significant flexibility in use. As average use is approx. 14 inches per acre, a 15% reduction would be 11.9 inches per acre (92% of NIR).
- If Augmentation provided within 5-years:
 - the 15% reduction phase will be extended to 10 years (through 2027).
 - The needed additional reduction to stabilize streamflows beyond 2027 will be determined and implemented via a second IGUCA process (or negotiation)
- If Augmentation is not provided, a 30% reduction will be implemented in years 2023-2027, and a future process would determine additional reductions required.

KDA DWR 7/6/2017

Local Enhanced Management Areas (LEMA)

K.S.A. 82a-1041

- Like IGUCAs, requires demonstrated problem: groundwater declines, dropping rates, etc.
- Similar tools as IGUCAs: allocations, rotation of use, etc.
- Like IGUCAs, due process required via hearings (as adjusting water rights)
- LEMA Plan to include conservation measures to address specific water resource problems.
- Hearings before the Chief Engineer to adopt, reject or return plan to the GMD
- Chief Engineer decision: is it consistent with state law; does it address the problem appropriately?

GMD LEMA discussions

- During September, the GMD indicated its desire to implement a LEMA to resolve the impairment:
 - Augmentation, up to 5,000 AF/year, 15 cfs
 - End gun removal
 - Other un-ordered means to accomplish the 15% reduction (reductions via buyouts, moving water out of the high impact area, voluntary reductions, etc.).
 - GMD believes the removal of end guns will accomplish most of the required reductions.

LEMA requirements to resolve impairment

- LEMAs have a goal and corrective controls to implement those goals.
- To allow use of a LEMA to resolve this impairment, we need certainty that the augmentation and pumping cuts will happen. This will require:
 - A schedule to put augmentation in place.
 - A quantitative goal to reduce pumping over 2020-2024 which will lead to halving the rate of increase of depletions
 - Early 2025 – an evaluation of whether required reductions are on track.
 - If required reductions are achieved, the plan continues for another 5-years, with evaluations at the end of each period.
 - If the required reductions are not achieved, allocations prescribed in the LEMA will be implemented for 2025-2029 to insure the required reductions over the entire 2020-2029 period are met.

Questions