

Rattlesnake Creek Partnership Meetings

Meeting Summary Overview

January 25, 1994 – February 21, 2008

January 25, 1994 (DWR Library, Topeka, KS)

Meeting Overview: The Basin Management Team Process and the Rattlesnake Creek Partnership and how the two will interact were discussed. The idea of a representative for the Partnership to work with DWR was mentioned as a good way for the Partnership to get involved with the BMT process. Water PACK plans to send a letter suggesting some changes be made to the work plan which may alleviate some concerns of the Partnership.

June 6, 1994 (Quivira Environmental Education Center, Stafford, Kansas)

Meeting Overview: History of the Partnership was discussed briefly. USFWS had the original idea of a signed agreement. The proposed draft of the Partnership Agreement was reviewed. All agreed that a signed agreement would be best and there was some discussion on how the Partnership could provide input into the BMT process. Comments were made by each Partner. BMT provided an update on the Rattlesnake Creek project

- Educational program
- Contractual arrangements with KGS and KSU
- Input from interested parties
- Meeting between the partners and the BMT

Contact person for representing each partner was established. The Partnership plans to meet again in November closer to the model selection process being completed.

July 11, 1994 (GMD 5 Office, Stafford, Kansas)

Meeting Overview: The meeting provided updates to the Quivira Partnership on the Rattlesnake Creek Project. A review of the scope of work contracts with KGS and KSU for preliminary computer modeling work, which should alleviate some concerns with the level of DWR involvement in the computer modeling aspects of the project. BMT provided the partners with a list of nine models and a draft list of model qualifications and capabilities which they gave to the universities as a guideline in the model selection process. There was discussion on various aspects of the model and its capabilities. It was agreed that BMT would conduct seepage runs and pump tests at the same time to check the model. Funding for the Quivira Project Coalition did not go through this year. BMT recommended that the model should have peer reviewers and asked that Water PACK and USFWS consider this and offer any suggestions to BMT.

April 6, 1995 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Agenda items included discussions on computer model, irrigation system survey, compilation of data, fact sheets, BMT goals and objectives and the

subbasin Citizen's Management Committee. GMD 5 reported on the moratorium and aquifer pump test. USFWS reported on water budget model for the refuge. Water PACK reported on the trip to Washington, D.C.

(No official notes were available. Information based on Agenda.)

June 14, 1995 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Updates were given by partners. GMD 5 updated the group on the Mineral Intrusion project. Water PACK reported on the well log data and the plans for the field days. DWR gave an update on the computer modeling work, change in basin designation, distributed revised copies of the Rattlesnake Creek Fact Packet and data outline and peer review for computer model. USFWS updated the group on funding for water storage facilities proposal.

(No official notes were available. Information based on Agenda.)

November 7, 1995 (Quivira Wildlife Refuge Office, Stafford, Kansas)

Meeting Overview: Project was moving into Phase IV, the development of management strategies. The Partnership needs to discuss how to make brainstorming activity work and begin compiling management options. The five phase BMT process was reviewed and the status of each phase given.

Phase I: Compile and review all existing data-phase is completed

Phase II: Additional data collection-ongoing with stream-aquifer tests to occur within the next six months of the project.

Phase III: Complete a hydrologic model-ongoing with work proceeding according to schedule. Peer review activities will begin, DWR has contracted with ASCE and Dr. William Yeh to peer review on behalf of DWR.

Phase IV: Develop management strategies-phase just beginning

Phase V: Implement management strategies-final phase

Discussion on how the Partnership members plan to conduct additional technical reviews of the model. There should be a plan of action to ensure all reviewers receive the information needed.

December 5, 1995 (Stafford, KS)

Meeting Overview: An outline of the peer review process was provided to the Partnership and Dr. Yeh's resume. Dr. Yeh responsibility will be have broad oversight of scientific and technical underpinning of the entire computer modeling process. KSU graduate student will be presenting a paper regarding the SWAT model and its use in the Rattlesnake Creek subbasin. The paper will emphasize the linking procedure between SWAT and MODFLOW. A draft press release was reviewed by the Partnership that will be an invitation for all interested groups to get involved in the development of management strategies that are just beginning.

A review of the data being used for project analysis and computer modeling was completed by BMT. There are two objects that BMT is looking to use the model: 1) to better understand the hydrologic system; and 2) have a long-term tool which is improved each time new data is added. A presentation was given showing the partners the entire modeling process. The group discussed the linkage of the MODFLOW and SWAT models.

July 22, 1996 (GMD 5 Office, Stafford, Kansas)

Meeting Overview: Partnership updates were given. DWR provided a summary of projects and briefed on computer model. Other items discussed were format for the Water PACK approach for public information at field days and the Partnership role in public information.

(No official meeting notes are available. Information based on Agenda.)

August 23, 1996 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: The meeting is to review and evaluate management alternatives. The group listed the problems and then prioritized them according to the interests of the Partnership. List is as follows (not prioritized):

- Quivira's specific demand for water and timing of need
- Vested and senior rights upstream of Quivira need to be quantified and then calculate minimum streamflow needs
- Water quality of surface water upstream and on refuge. Also, non point source pollution problems
- Unregulated domestic uses basin wide
- Percent change in saturated thickness
- Groundwater and surface water interaction
- Pumping induced mineral intrusion
- Water right regulation, specifically overpumping
- Economic stability
- Education.

The computer model was discussed and status report given by BMT. The Partnership requested that the BMT bring numbers for groundwater and surface water goals to be reached to the next Partnership meeting as a beginning point.

September 18, 1996 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: A review of the accomplishments of the Partnership was provided:

- Comments and recommendations on the computer modeling work
- Reviewed existing data and collected data during the project
- Water PACK and KSU conservation program
- GMD 5 closing the subbasin to further appropriations and installation of weather stations

- Cooperative work with the Quivira Coalition on getting funds for the feasibility study for the refuge

The remaining steps for developing new management alternatives were reviewed.

October 17, 1996, (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Each partner provided updates to the group. USFWS reported that the feasibility study proposals were due on October 7. The next step is cost analysis for the work and then a trip to DC for an audit. The job should be awarded by winter. USFWS plans to use the KDA-DWR model for some of the inputs into their model. GMD 5 reported that they are busy processing applications throughout the District and the Mineral Intrusion Area. The partnership discussed a letter written by Secretary of Agriculture to the NRCS, Stafford Board regarding a task force on comprehensive basin planning. The Partners agreed to all participate in this group to make sure efforts are not duplicated and to keep the task force up to date on the Partnerships work.

Dave Young, KGS gave a presentation on the mineral intrusion work study being conducted by KGS and GMD 5. The study will assist the group to make decisions on management options for that area of the subbasin.

A general discussion of how water management philosophies have changed over the years, what are the overall goals of the Partnership, what is appropriate level of management and what exactly does the Partnership want to accomplish. The hydrologic model should assist the Partnership in making some of these decisions. The overall conversation was identified as the most difficult type of decision facing the Partnership and that it wouldn't be resolved in one or two meetings. The group asked that it appear on every agenda until the group does work through the issues and make some decision.

The Partnership was divided into subgroups to work on issues related to mineral intrusion, stream flows and groundwater declines and to prioritize the list of management options. The group discussed how to make contact with the appropriate agencies and express interest in the programs they have to offer. It was decided that a letter would be drafted to each agency head to invite them to meet with the Partnership. A general list of ideas and an agenda will be generated prior to the meeting with the agency heads. A list of incentive programs was generated and a person responsible for looking into the program by the next meeting.

November 21, 1996 (Quivira National Wildlife Refuge, Stafford, Kansas)

Meeting Overview: Each partner was asked to lay out their idea of the Partnership overall goal. KDA-DWR goal is to adopt a program that addresses the issues of streamflow depletions, groundwater declines and mineral intrusion. GMD 5 goal is to address the high decline areas through proper management and conservation measures and low flows in the Rattlesnake Creek during times of drought, using wells to augment the stream. USFWS goals were similar to the irrigators who use the irrigation to take the

low water years out of their operation and have more sustained economic return from their investment. They desire to have a constant water supply to the refuge during the periods of highest need for the wildlife. No comments had been received from Water PACK at this meeting. The goals were discussed in terms of agreement/disagreement of the feasibility and how the Partnership could get to those ends.

A progress report was given by each person responsible for checking into issues from the previous meeting. The mineral intrusion study was discussed and should there be any enhancements to this study. An open forum was held for people to ask questions or identify topics for discussion. The main topic of discussion was on the computer model and its current status. USFWS reported on the status of the feasibility study bidding process. The wrap up the meeting the group discussed in more detail the identification of problems and the areas of the subbasin they occur. Based on these discussions the group was divided into two smaller groups to address groundwater declines and streamflow. The groups should look at the facts (general trends), look at ideas to stabilize the trends and extent of desired recovery and begin thinking about time frames for recovery.

December 13, 1996 (DWR Stafford Field Office, Stafford, Kansas)

Meeting Overview: Each Partner provided updates. The group discussed the time line and updated by identifying specific work and the length time it would take to complete. A meeting with SCC was scheduled to talk about CRP and the Water Rights Purchase Program. Gary Clark, KSU extension office, spoke to the group about the cooperative work they are doing with Water PACK in thirteen counties in south-central Kansas. There are conservation educational efforts conducted in the field last summer and there will be more events this winter.

Work began with the two groups as outlined in the last meeting. The Partnership divided into groundwater and streamflow groups and began analyzing the trends, considering ideas to stabilize and the extent of desired recovery. This work session will continue at the next meeting. The streamflow group identified the following as concerns

- Next to the refuge
- Upstream flows
- Gaining and losing reaches

Possible resolutions discussed were tree removal, especially Salt Cedar and leasing upstream surface water rights to provide Quivira additional flow during drought years. The discussion will continue at the next meeting.

The groundwater group discussed applying the management program subbasin wide as what is completed in one portion of the subbasin may affect another portion, but be more intensive in high decline areas. The group decided that immediate attention should be given to areas that have declined 16% or more in saturated thickness. The immediate goal is to reverse the current trends of groundwater declines by:

- Enhancing recharge-several small retention dunes to pool high rainfall events
- Eliminate appropriations-water rights buy back and water banking

- Conserve in appropriations-incentive programs

During the next meeting the group will begin to detail steps necessary to reverse the trends and match supply and demand.

January 22, 1997 (DWR Stafford Field Office, Stafford, Kansas)

Meeting Overview: Each partner provided an update. Water PACK reported that they gave testimony to the legislature for the KSU research station as part of their ongoing work for conservation. Water PACK is currently funding the program with \$20,000. The process of public education is slow but making headway. They encouraged the Partnership to mention the work they are doing whenever possible. They are noticing a change in attitudes amongst their members. They presented the Buy Back Program and the group appeared receptive this concept. GMD 5 reported that they are doing a lot of work on well drilling related to the hold on applications during the moratorium. They are planning water use workshops. They added that the EQIP program is going ahead and that areas of the state are getting involved. USFWS reported that they continue work on the water budget model and that KGS preliminary work is being reviewed. DWR reported that the chief engineer had accepted the changes to the timeline proposed by the Partnership. It was announced that similar efforts are beginning in the Middle Arkansas River subbasin.

It was suggested that a summary of work be completed by the Partnership. This summary could eventually be used as a portion of the written management program. Staff will draft a summary and provide to the partners for review. Staff proposed holding small meetings with subbasin residents to discuss issues.

Staff briefed the group on meetings held with SCC and KWO. The meetings were positive, but there were concerns expressed about the amount of money it would take to purchase all water rights coming out of CRP. The group began discussing prioritizing areas in order to get the most bangs for their buck. The group agreed that the buy back program and water banking should be agenda items for the next meeting. The group reviewed a proposal developed by NRCS to be submitted to the state technical committee. The Partnership felt the proposal needed some more work and developed a list of what they hope to accomplish with the EQIP program.

- Change in water management
- Change in water delivery technology
- Reduce water appropriations
- Recharge projects
- Residue management \$2/acre

The group agreed that the money from EQIP has potential. The group felt there is a need to create incentives instead of forced regulations, working with Water PACK and KSU for conservation and improved water users, technical and management advances as well as water scouts to work with smaller farm operations.

February 27, 1997 (Stafford, Kansas)

Meeting Overview: Each partner provided an update. Water PACK reported they met with SCC, Governor Bill Graves, KWO, DWR, Sierra Club and Audubon Society. Overall the meetings went well. GMD 5 reported that they are doing research on GMD 3 depletion policy related to tax deductions being given for allowable depletion of the Ogallala aquifer. They reported that the water use workshops were beneficial and had a good turn out. The focus of the workshops was on maintenance of water rights, irrigation scheduling, weather stations and updates on the Partnership. The GMD 5 is proposing an irrigation demonstration project that would be assisted by Pioneer and Crop Quest as well as other businesses. USFWS reported that the water budget model is coming along. Data collection is still occurring and that the feasibility study went to the auditors. DWR report included asking if each Partner had completed their inserts for the progress report and pamphlet. Staff provided an update on the status of EQIP proposal. DWR reported on regulatory notices sent out in the subbasin for overpumping, abandonment and incorrect meter installations.

The Partnership separated into the smaller groups to focus on streamflow and groundwater issues. Streamflow group discussed avoiding the peaks in extremely dry or wet years as a goal for the refuge. The goal of the group is to change the direction of the trend in an upward direction. Staff will prepare a packet of information and a list of quality and quantity issues previously listed by this group. The groundwater group discussed the concept of isolating areas of the subbasin for different management approaches. It was decided that management alternatives developed that require funding to accomplish should be focused to those areas as declining 16% or more in saturated thickness. This is not singling out individual water uses but providing assistance to those individuals to continue irrigating. It was also discussed to not look at pre-development water levels but use 1997 as a base for the future. Use of small retention dams to enhance recharge was discussed. The group wants to use the model to test the viability of this option and to compare differences in recharge and hydrology in the decline areas versus non-decline areas. The group wants to use the model to evaluate how much water use must be reduced to decrease current trends. The group decided that the model is needed to establish best acceptable goals and during the next meeting will begin to address the water use versus water level changes over time.

March 18, 1997 (USFWS Regional Office, Denver, Colorado)

Meeting Overview: Updates were given by each partner. Water PACK had recently traveled to Topeka and DC to discuss EQIP proposal and pursue funding for the water rights buy back program. GMD 5 reported current projects within the District as irrigation scheduling, installation of weather stations, atrazine sampling of area streams and rivers and the EQIP proposal. DWR provided information on the BMT program and why it was initiated and how the Partnership was involved with this process. The final computer model report, users manual and fact sheets will be presented at the April Partnership meeting. The model will be demonstrated during the May meeting. USFWS summarized the situation that occurred with Cheyenne Bottoms, Wildlife Federation and

DWR that lead to the Walnut Creek IGUCA. The Partnership has been able to lobby for funds for the refuge to complete the feasibility study. The model will enhance the ability of the refuge staff to manage incoming Rattlesnake Creek flows. The water budget model and the feasibility study are scheduled for completion fall 1997.

The group discussed the upcoming Coalition meeting. The agenda and invitation list was discussed. Staff provided a streamflow handbook to those who are on the streamflow group. The workbook has key streamflow data and management strategies in on location. The work book should be brought to all meetings. Also handed out was a table of the groundwater data that will be used in the future by the groundwater group.

April 14, 1997 (GMD 5 Office, Stafford, Kansas)

Meeting Overview: Each partner provided updates. USFWS reported that the bid for feasibility study was to be accepted during May. They spoke with Ducks Unlimited about the refuge acquiring land adjacent to and upstream of the current refuge boundary. They are interested in funding possible structures that could be built on this property. They met with KGS and they continue to collect data for the water budget model. GMD 5 reported the board voted to suspend further processing of twelve new applications in Northern Stafford County for a period of 30 days. This will allow time for a public meeting or hearing to obtain information on the public interest associated with these applications in the salt water area. Water PACK reported that the final copies of the EQIP proposal are ready to be distributed. Monsanto has agreed to fund the irrigation project. KSU is applying for a grant from the Fund for Rural America program that will assist in the continued funding of the project. DWR reported the computer model final report is undergoing minor revisions as a result of peer review. It will be finalized in the next 2-3 weeks. Demonstration of the model is planned for May.

The group decided to approach all granting agencies with the overall goal of water conservation. The divided the potential projects into three categories

- Structural Program
- Best Management Programs
- Research

A list of potential grantors was created by the group for outlining projects in a grant proposal.

May 20, 1997 (DWR Stafford Field Office, Stafford, Kansas)

Meeting Overview: Water PACK reported the grant proposal was submitted, they will be announcing a winner of their scholarship student studying Biological Sciences and the funding for the SCC irrigation initiative and demonstration project. GMD 5 provided a summary of the public meeting hosted by DWR to obtain input from local residents on the 12 pending new applications. As a result the GMD 5 board may require additional monitoring requirements of the existing irrigation wells in the area. USFWS reported they have delayed acceptance of a bid for the feasibility study until June. Congressman

Moran will be stopping at Quivira on his listening tour. The plan is to prepare a short program summarizing the Partnership, specific federal funding issues and EQIP to discuss with Moran. DWR reported that a meeting time had been set to work out the logistics of the irrigation initiative funding for the subbasin. The group is discussing creating a video of the project. DWR provided the final model report to the Partnership and demonstration was conducted.

June 20, 1997 (GMD 5 Office, Stafford, Kansas)

Meeting Overview: Each partner provided an update. DWR presented the idea of working on the development of management alternatives with each Partner between meetings. Other alternatives were discussed as well. The group agreed that more work on the management alternatives is necessary. They will all come to the next meeting with five draft management alternatives outlined in the workbooks and discussed at the next meeting. Revised goals and objectives will be mailed for discussion at the next meeting. The Partnership agreed a letter should be send to SCC updating them on the meetings held the previous data and ask for consideration of targeting areas as part of the program requirement for additional cost share money.

August 29, 1997 (Stafford, Kansas)

Meeting Overview: A review of the details of the management alternatives presented at the last meeting. Each partner had a chance to review prior to the meeting. USFWS reported work on the water budget model and the feasibility study. GMD 5 reported on the water rights buy back program and that the district would need a 20% match. USFWS asked for enforcement of over-pumping and other permit restrictions, calculate safe yield more accurately and decide the level of management to be achieved, and water banking. Water PACK's and GMD 5 discussed how they could jointly peer review the model using the same reviewer. The group developed an outline to define the pieces of work that are to be completed to define sustainable yield.

- Quality of ground and surface water
- Streamflow-surface water rights timing and MDS
- Groundwater-areas with greatest change in percent saturated thickness
- Target goal for quality of streamflow and groundwater

The group decided they needed to look and see if the current level of appropriation is sustainable within the subbasin. They want to look at a range of number with minimum and target levels to be met within a set timeframe.

Water PACK wants to include a five year rolling average for allocations program. USFWS updated the group on the completed KGS and USGS models for Quivira. GMD 5 reported that the board is discussing a five year plan with DWR. More detail will be provided to DWR after their next board meeting. Water PACK provided an update on the educational program with Monsanto. They would like to use the model before making any further suggested management alternatives. No comments on the revised goals and objectives so the group agreed to bring prepared documents to the next

meeting. DWR staff will begin to write the management program and discussed how each partner could be involved. GMD 5 will reference the subbasin in the district management program. An update was provided on the Middle Arkansas River subbasin project.

October 10, 1997 (GMD 5 Office, Stafford, Kansas)

Meeting Overview: The group discussed how to approach the grant proposal process. The group decided that it would be best to hire a professional grant writer.

January 15, 1998 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: DWR provided groundwater maps to assist in developing the target ranges for groundwater levels in the basin and explained how these maps were generated. DWR also explained how baseflow estimations were generated using HYSEP. Using HYSEP DWR created graphs for both USGS gages. The partnership requested further streamflow analyses. Using the previous information, the partners discussed target ranges for both streamflow and groundwater in the subbasin. John Jackson and Sharon Falk are still working on grant funding for management activities. They are asked for money for retention dams and the KSU conservation project. Partners discussed educational activities. The Partnership Video was revised and ready to be shown at ED, SF and KW counties Conservation District annual meetings. GMD 5 reported that water use workshops will take place and are planning to talk about irrigation conservation project and the use of weather stations. GMD 5 has submitted their management program to DWR for review. Water PACK reported that their consultant will meet with DWR and the computer modelers. Their consultant wants to review three general issues with the model

- Can the model adequately reflect pumping changes
- Sustainability
- Groundwater movement

DWR handed out a packet which described the water planning process as requested by the partners at the last meeting and the final reports from KSU and KGS. A progress report was also being drafted for the chief engineer. USFWS reported work was still progressing on the feasibility project. A progress report is being reviewed and the partners will be updated at the next meeting.

A draft table with target ranges for management program was provided. Each partner is being asked to fill in their suggested goals for each category and performance measurement.

March 6, 1998 (KDA-DWR Headquarters, Topeka, Kansas)

Meeting Overview: Each partner provided updates. USFWS reported that a draft final report is due March 23. The final report is scheduled for completion in April. The report

will likely conclude only two options are feasible to improve water supply to Quivira, which are supplementing water to the refuge from Arkansas River or streamflow from wells upstream of the refuge. Other options are not cost effective. GMD 5 reported that they had positive responses to their questionnaire and it will be discussed at their annual meeting. No report from Water PACK. DWR staff provided a summary of the meeting held on March 5, with computer modelers and the Partnership. A list was generated on the items DWR agreed to complete related to the SWATMOD model.

Analyses requested from last meeting regarding winter streamflow were presented to the Partnership. The analyses show that streamflow has declined over time at both USGS stream gages. USFWS also conducted an analysis of streamflow duration frequency. The analysis illustrates results similar to the baseflow analysis by DWR, but in a different way. USFWS feels these declines are likely detrimental to the Service. Precipitation was also analyzed. It was requested that a double mass balance be conducted. USFWS agreed to do the analysis.

Water PACK reported that want to discuss where Water PACK is going from this point with the Partnership. They introduced their consultant, whom provided comments on the previous days computer modeling meeting. The consultant pointed out that the SWATMOD is only one tool that can be used to develop the management program. Water PAK wants to know how well SWATMOD can be used as a tool to address the primary target areas identified by them.

- Declining streamflow
- Declining groundwater levels
- Quivira

The consultant felt that SWATMOD would not give them the best answers to their questions. This led to further discussion by all partners. Water PACK does not want to spend anymore money on SWATMOD. USFWS felt that the Refuge is not getting the water it needs, but stressed the importance of addressing groundwater declines. USFWS wanted to avoid calling for administration. Streamflow augmentation is being proposed by Water PACK and USFWS seems to think it would be a viable option for the partners to make sure the Refuge receives its water.

The partners discussed how to address the groundwater declines. Options are the water right buy back and water banking. USFWS did state that the group needs to address the decline areas and not just Quivira. The Service doesn't want the status quo to be maintained. An update was given on securing funding for the projects. It appears many of the outside organizations and Kansas delegation are impressed with the work of the Partnership.

DWR stressed that the models purpose is to evaluate long term solutions and make sure this not a negative solution. DWR is ok with not using SWATMOD if that is the wishes of the group. The goal of SWATMOD is to simulate the long term trends associated with management alternatives. It has its limitations but can be a valuable tool.

June 23, 1998 (Stafford, Kansas)

Meeting Overview: USFWS introduced Burns & McDonnell personnel who had completed a study on Quivira Refuge. The study outlined several options to help Quivira get the water it needs.

- Identify potential reservoir sites in the subbasin-the cost/benefit ration is not feasible
- Aquifer recharge-streamflow averages show there is not a lot of water available for storage. There is water only available during wet periods. This yield a very low cost/benefit ratio.
- Quantify groundwater flow near big salt marsh-results of the steady state model were discussed
- Alternatives for optimizing refuge operations-none provided new additional wetland habitat without additional water supply.
- Streamflow augmentation seems to have the best cost/benefit ratio of all the options and is being recommended by the consultants.

Alternative comparisons were discussed. The average amount of water in Rattlesnake Creek available to the refuge is approximately 6,000 AF. Storing excess water from the creek is not feasible because of cost and the fact that no water is left over to use after one year or so. Implementation of the augmentation project was discussed.

Temporary impoundments were discussed. KDWP are asking for no impoundments as they obstruct habitat of endangered species. Along Wildhorse Creek, could be an option to stop runoff during rainfall events. The group is looking at these for recharge to groundwater. Impounding water upstream does not directly benefit the refuge.

Water banking is discussed. The proposal has both short and long term corrective measures for the entire subbasin. Water Rights buy back program was also discussed. The mineral intrusion area was discussed. Any well testing >500 ppm chloride at bedrock will be required to have an observation well. They also discussed using the buy back program as an incentive to not drill a new well and permanently retire the water right.

GMD 5 handed out a review outlining their target ranges which will be discussed at the next meeting. USFWS provided the double mass balance analysis. It was decided for the next meeting that GMD #5 will look at 2-mile corridor, everyone will review the proposal submitted today and target ranges will be further discussed by each partner.

July 29, 1998 (Stafford, Kansas)

Meeting Overview: USFWS provided a handout of comments from the previous meeting proposal. The group was trying to understand the intent of USFWS. The majority of the discussion was focused on the goal to get Macksville gage + or - 10% of pre-development. The discussion then led to defining the corridor. GMD 5 used the model and DWR seepage run data to identify key areas of the subbasin.

- Flux boundary areas on the south side of the subbasin where groundwater exits

- Areas where flow vectors show direction of flow toward and away from the stream
- Areas where there are many or very few wells

GMD 5 feels that water levels are key to the management of the subbasin. Gaining and losing stretches of the stream were reviewed. The group agreed that they needed to decide how to use the data. GMD 5 agreed to write a description of the recommended area to focus management alternatives for streamflow and draw a map. Timeline of the management program were discussed. USFWS commented that it should be shortened but long enough to let people make use of volunteer programs. USFWS and environmental groups would not agree to 25 years. If goals are not met in 12 years then there would be stringent cut backs. The group needs to decide on some specific standard terms and definitions. Decide if they will use water use or appropriated quantity in the reductions in the plan. This will be discussed at the next meeting. GMD 5 is using an average 60% of appropriations to calculate the water use portions of water rights in the corridor. The stream augmentation proposal was discussed. USFWS feel that this is a short term solution. GMD agreed that augmentation should be a short term solution.

Mineral intrusion area's aquifer is full at present. The group discussed redrilling wells and how long it takes. They discussed requiring water samples. Public relations of the program were a concern. Most people at the meeting felt that operators would be willing to incorporate part of the program if they were properly educated. Some members of the discussion think that getting the water to Quivira is the only issue. DWR point out that groundwater declines is also an issue. DWR provided an updated version of the program and water savings for each program. A press release was drafted by DWR and provided to the partners for review.

August 26, 1998 (Stafford, Kansas)

Meeting Overview: Partners discussed revisions to the streamflow section of the management program. GMD 5 handed out their revisions to the proposal. The water banking section contains more restrictions and they added the five year water right program. Another proposal by GMD 5 is to purchase water on an annual basis through the water bank in dry years instead of using the buy back program to permanently retire water rights. Basically pay people not to irrigate. GMD 5 presented the work on the defining the corridor management unit. They noted that during dry years significant amounts of over-pumping occurred in this area. A suggestion by GMD 5 is to install a monitoring network south of the creek to determine how to improve the corridor area. Water PACK has not made any changes to the proposal. USFWS presented their comments on the proposal. The numbers proposed do not meet the timing issue and the only way they are going to do that is to pump water to the stream. They would like to have the supply of water and timing issue addressed. USFWS would like for GMD 5 proposal to include that it would improve conditions and that GMD numbers should not be used to set targets.

There was discussion about goals whether they should be based on water use, appropriation or streamflow. The consensus was streamflow. There was discussion on whether the corridor should be set at 2 miles. Based on GMD 5 data it appears this would be best and would have the biggest impact to the stream. They agreed that the goal is improvement in the hydrologic system. The groundwater management area was discussed next. GMD 5 focused on smaller areas that have declined 20-25 feet. It was decided to use the GMD 5 area as tier 1 and DWR area as tier 2. The final report will include management alternatives developed and the involvement with the Partnership. DWR will write up their part and suggested that each partner write up theirs. The Press Release was approved by the group to send out to all newspapers and the Water PACK and GMD 5 newsletter. GMD 5 and Water PACK reported they have started working together on writing grant applications. It was agreed that DWR will attend the GMD board meeting with analysis and Water PACK will attend as well. This will allow some progress without having to have a full partnership meeting in October.

October 28, 1998 (Stafford, Kansas)

Meeting Overview: Discussion on water use verses water appropriations was the first topic. The group decided to focus on reducing water use. Proposals from Water PACK and DWR were handed out and discussed. The goal was changed from reducing groundwater use to improving streamflow and groundwater levels. The timeframe was discussed. It was suggested to start with a 15 year timeframe. Partners talked about raising money and the particulars of the water rights purchase program. GMD #5 agreed to consider going to the legislature to ask for the flexibility to complete special assessments. The partners discussed the particulars of the water rights purchase program and how the bid process will work. The group decided to let the free market drive the bidding process. A new concept was discussed, water transfers. This would be moving water rights out of the corridor to another part of the subbasin. Time was spent reviewing the regression analysis that was completed to get the water use numbers for the corridor and groundwater decline areas. Water Banking was discussed and how much water can be saved. The group decided that each would read the water banking task force report and discuss at the next meeting. The consensus of Water PACK is that not lot water could be saved through conservation. GMD #5 provided a hand out of how the 5-year program could benefit a producer. GMD #5 thought that compliance and enforcement would be an important and necessary part of the program. Other partners were not easily convinced. They asked for a more detailed report for the next meeting. USFWS did not think 2500 AF every 5-years would be enough water for the refuge especially in drought years. USFWS also wanted to know the definition of a drought year. Water PACK felt that the whole basin should be available for management options. DWR agreed to run SWAT MOD at 12% and 15% water use reductions. DWR agreed to provide a draft of the management program to all partners before the next meeting.

November 24, 1998(Stafford, Kansas)

Meeting Overview: The overall goal for the groundwater management untie as discussed. It was suggested that the wording change to describe stabilization of

groundwater levels and increase them over the long-term. DWR described the different model runs requested. Comments being returned to the partners on the water rights purchase program are not positive but they did like the drought contingency plan. A five year rolling average of 25 cfs and groundwater of 12 inches was proposed. Use the streamflow as an indicator for drought for the water use reductions. After a 12-year period need a program in place that considers groundwater and streamflow on an annual basis. Each partner describes the areas they would like to include in the groundwater unit. Partners re-wrote the groundwater section during the meeting.

- Goal: stabilize groundwater declines and over the long-term increase the levels
- Objective: reduce water use in the groundwater management unit through incentive based programs
- Method: achieve by saving 22, 074 acre-feet in average annual water use
- Progress: review and evaluate the effectiveness at least every 4 years. After 12 years, if necessary alternative action plan should be put into place, such as more restrictive water use goals. The volume should be revisited at the 12 year evaluation.

There was discussion on where to target the water rights purchase program. GMD 5 thinks the stream corridor should be the area before the groundwater area. The group agreed that DWR should make the changes discussed and send the updated document it to them. They also agreed that the low head dams and potential recharge effects was of interest to them.

May 24, 1999 (Stafford, Kansas)

Meeting Overview: The meeting was held to discuss the Confirmation of Program Components document. The document covers the key points contained in the management program. It was used during the meeting to come to a consensus on how the program is written. Several changes were made and was approved all the partners. The Partners discussed the information/educational efforts that are needed to advise the public of the new management options. Five key elements were identified to stress at these meetings.

- Environmental
- Competing Uses
- Politics
- Society
- Time

It was also suggest that a booklet be developed for use by water users to determine how to use the new management options. The USFWS provided an update on the Burns and McDonnell's findings. The conclusions are that drought contingency plan was not cost effective. USFWS is willing to wait, provided that the progress checkpoints are made. Progress needs to be made. This section was removed from the program.

July 27, 1999 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: A roundtable discussion was held with the chief engineer.

Water PACK stated that good, clear, defensible numbers must be used in the management program. They hired a consultant to review the number in the corridor and groundwater units. The organization remains deeply committed to the Partnership. A report of the findings was presented to the group. The numbers are different than DWR's regression analysis. The corridor analysis is separate from the high decline area. An explanation was given on why there were differences. The consultant feels augmentation is the best way to meet Quivira's needs. GMD 5 would like to have the analysis completed by Water PACK to be looked at. GMD 5 felt that if water use could be lowered than the problem could be handled locally and there would be no need for expensive programs such as augmentation and water right purchase. USFWS is getting more uncomfortable with the management program because of the amount of time it has taken to get to this point and the manner in which the management plan is written. There is no guarantee that things will be any better at the end of 12 years. Upper management is starting to put deadlines on the management program. They also provided direction for future work. Chief Engineer opened discussion on the importance of wrapping up the program and the goals. Partners wanted a conference call in 1-2 weeks to discuss revisions to program. Numbers will be discussed. DWR and USFWS need to provide feedback to the rest of the group.

August 24, 1999 (Stafford, Kansas)

Meeting Overview: A list of items to be resolved was generated

- Need to complete management plan soon if funding is obtained
- Alternative actions-new method
- Agree 25 cfs in January at Zenith gage is #1 goal for corridor
- Addition of detention dams on Wildhorse Creek
- Water use numbers to maintain streamflow and stabilize declines in groundwater units
- Numbers from GMD 5
- Funding for augmentation wells
- Overall funding the management plan

A design of detention dams on Wildhorse Creek was presented as a pilot project. GMD 5 has identified high priority areas and would like to discuss a point system that could be developed. This would be used for the bid process for the water rights purchase program. DWR summarized a review of Water PACK analysis and felt the most recent numbers were more valid than previous ones. Partners revised numbers on alternatives funding spreadsheet. Water PACK and GMD 5 will be testifying at the interim committee meetings to support water banking and water purchase programs. The draft management program proposal will be revised. Another meeting will need to be scheduled to review the changes. Draft of management program needs to be updated by October 1st.

October 12, 1999 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Discussed addressed application of USFWS suggested augmentation needs and time-frame (15 days). A more specific volume of water needed

will be decided by USFWS so that a trigger point can be determined at the Little Salt Marsh. The consensus was that augmentation prior to a critical drought status at the refuge would be more effective water management. Information on chloride and water quality characteristics will be required for augmentation. GMD 5 is working with a grant writing specialist for the low head dam project. GMD 5 completed the assessment using 1999 water level data to determine priority areas in the subbasin. Funding of the water banking and water rights purchase program was discussed. They also decided to look at the CREP program. The group decided work needs to be done on the rules and regulations associated with each of the management alternatives.

November 30, 1999 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: The priority areas were discussed. It was decided to extend the program area #3 to meet program area #1 and eliminate the middle #4 area. Add program area #5 which would be the area north of the stream to highway 281 and the other program areas remain as originally proposed. The alternative actions were discussed. USFWS provided an augmentation plan update. USFWS will continue to work on the augmentation plan. The management plan was reviewed and edited.

February 24, 2000 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: The Partners discussed priority areas. Alternative actions, augmentation, the water rights purchase program, five year water rights concept, end guns and water right transfers. Partners discussed initial writing of rules and regulations of the different programs, description of augmentation program including trigger point and definition of 'drought' time when augmentation is not effective. Final edits to document, maps and spreadsheet are being completed.

March 14, 2000 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Final edits and updates are being completed by assigned partners. These include boundary issues, educational pamphlets, groundwater and streamflow monitoring program, writing of rules and regulations, augmentation program. Each partner needs to have a draft of the management program for the next meeting.

June 29, 2000 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Final edits and signed off the Rattlesnake Creek Partnership Management Program. Final Draft of Rattlesnake Creek Partnership Management Program is signed off by all partners.

April 13, 2004 (Big Bend GMD #5, Stafford, Kansas)

Meeting Overview: Partners updated the Partnership mailing list. SCC provided an overview of the Water Issues Strategic Team (WIST) process and how the issues are

addressed through the Natural Resource Sub-Cabinet, KWA, and BAC. Staff provided an overview of the Rattlesnake Creek Water Issues Strategic Plan (WISP). Partnership provided information that will be updated in the WISP and tagged the Water Rights Purchase Program as the number one priority to be funded in the subbasin. The Partnership plans to set up a meeting with Senator Brownback to provide a tour of the subbasin in an effort to reacquaint with the water issues in South-Central, Kansas. The Partnership plans to develop a Public Relations Plan that is agricultural related, provides visual aides to hand out to irrigations in the subbasin.

Criteria for 4 year review were set on streamflow and the interaction between the stream and aquifer system. GMD 5 will update the moving average of water use and will be requesting 2002 and 2003 water use. GMD 5 provided two reports, 2003 data on transect wells and the Mineral Intrusion Area Report. Next meeting Partnership will review the RSC WISP and the 4-year Management Program.

August 18, 2004 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Partnership provided updates. USFWS announced that Quivira Wetlands has been designated by the Ramsar Foundation as a “wetland of international significance”. Water PACK gave Sen. Brownback a tour of the subbasin. GMD 5 stated they installed transect wells to study the stream-aquifer interaction, determined augmentation to be too costly to implement, no money to make the water rights purchase program successful and a water banking committee has been established. DWR described the agency’s enforcement activities, continued monitoring of groundwater levels, state agencies have been working to develop a new pilot project called ITAP and the water banking rules and regulations have been completed and are effective.

Staff provided an update on water use by year in each priority area. Comments were made about how the aquifer recharges and now due to lack of significant rainfall, the water levels are at their lowest and all recharge of the 1990’s has been consumed. Review of goals and their successes over four years. Some of the programs have seen no participation or very little. A data analysis discussion followed. Irrigation systems have been upgraded to more efficient systems. Management needs to be the focus. It was felt the WISP concept is a good one and will hopefully lead to more action than in the past. But, local people need to be involved in the discussion with the government agency people so that what is developed can be realistically implemented. Another comment was the Partnership needs to account for the lack of rainfall. How does the Partnership know that water was actually being saved but the effect is lost by lack of rainfall and recharge? The effect of CRP land coming back into production also needs to be included in the water use evaluations. The responsibility for conservation needs to be shared. Joint effort by all partners is needed to publish and distribute newsletter about the subbasin. USFWS made the point that many of their agency’s people who participated in Partnership will be retiring within the next four years. USFWS will be closely monitoring the success of the next four years. All partners are to summarize their ideas on each program objective as to how to make the overall program more effective. DWR will assemble the summaries and the partnership will discuss them at the next meeting.

November 10, 2004 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Partnership updates were given. Water PACK gave Senator Brownback a tour of the subbasin. GMD 5 emphasized the need to remove end guns to meet conservation goals. DWR updated the group on abandonment files and the deadline to have these files identified and the effectiveness of the BRO project in the subbasin. The Partnership agreed to a quarterly newsletter. The group discussed the ITAP program. It was stated that ITAP is being supported by KLA. GMD 5 would like to see end guns purchased through the program or something similar. Partners agreed to an addendum to the original management program that would outline the effectiveness of the first four years and the goals for the next four years. The group agreed that the corridor is still the primary target but water conservation is needed in the entire subbasin to meet goals. The goal is to maintain baseflow and if met then they have made progress. Since funding is limited for the programs the focus over the next four years is on programs that focus on conservation and enforcement by DWR. KLA supported the restoration of the state water plan fund to target conservation in the subbasin and stressed that Water PACK should as well. Other groups need to get on board and understand the big picture; the result is an IGUCA if the goals are not met. This will be a large economic impact than ITAP or similar programs. The Partnership will finalize the 4-year review in January.

January 25, 2005 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Partnership updates were given. Water PACK held a conference on water conservation and Ag profitability. The management program was also presented. GMD 5 held their annual meeting and hearing on revised budget. USFWS and DWR had nothing to report. Partners discussed edits and updates for addendum and also proposed new ideas for conservation. GMD 5 discussed creating a 5-year program that would give credit towards mandatory reductions. GMD 5 and Water PACK suggest that this program would work if they could get assurance from the chief engineer that cuts made will not double whammy those who conserved. They want a credit for conservation. Some of the proposed new ideas were:

- Shut off MDS wells
- Mandatory end gun removal
- Develop a point system to give credit for each conservation practice
- Find ways to get more people to attend conferences and meetings for increased participation in programs

Water PACK and GMD 5 asked USFWS if an extension of four more years is possible if strategies like end gun removal is implemented in the subbasin. USFWS would review, but did not see any immediate reason why the extension would not be possible.

March 15, 2005 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Partners provide updates. Water PACK have been working with legislators and state agencies on getting the ITAP bill passed this year. It is stalled in the House and introduced in the Senate. Water Congress is assisting as well. GMD 5 plans to have meeting that will provide water users in the district information on water banking and the timeframe to participate. Partners discussed four-year goals such as GMD 5 end gun removal, establishment of point system for conservation credit, promotion of management program to get participation and tillage practices and alternative cropping. Partners added final edits to addendum and reached a consensus.

February 21, 2008 (Stafford Field Office, Stafford, Kansas)

Meeting Overview: Partnership gave updates. GMD 5 stated that there had been one water right approved for the Water TAP program. USFWS has a couple of staff retiring and Kansas will be moving into a new district. Water PACK will be electing a new president at their annual meeting. DWR has a new chief engineer and new staff members on Basin Team. Compliance and enforcement has had significant impact on water savings. Other updates were given as well. KWO completed an augmentation study per legislative request. There appears to not be a lot of interest in the program. An overview was given on the Partnership and the project area. DWR presented Rattlesnake Creek modeling project including the purpose of model, reasons to collaborate and reasons to update an existing model. Discussion and questions followed from all the partners. Written responses from each of the partners regarding whether they wish to participate in the Rattlesnake Creek model TAC are expected by mid to late-March.