Frenchman Valley Appraisal Study
Initial Modeling Needs

Modifying existing Republican River Compact Model

Input considerations for modeling effort
- Upper Republican Natural Resource District Integrated Management Plan
- Middle Republican Natural Resource District Integrated Management Plan
- Republican River Water Conservation District in Colorado
- Conservation Reserve Enhancement Program (CREP)
  - Colorado, Nebraska
- Environmental Quality Incentives Program (EQIP)
- Frenchman Valley Irrigation District – 9,295 acres
- H & RW Irrigation District – 11,695 acres
- Estimated 65% of releases from Enders reach Culbertson Diversion Dam
- Estimate District delivery system efficiency at 50%

Exiting Conditions – assuming no reservoir releases.

1. Future water supply at Enders Reservoir (without releases)

   Incorporate Upper Republican Natural Resource District's Integrated Management Plan regulations on upstream groundwater wells, new restrictions from the Republican River Water Conservation District in Colorado, CREP, EQIP, etc.

2. Future water supply at the Culbertson Diversion Dam (near Palisade) (without any releases from Enders)

   Incorporate Upper Republican Natural Resource District's Integrated Management Plan regulations on upstream groundwater wells, new restrictions from the Republican River Water Conservation District in Colorado, CREP, EQIP, etc.

3. Future water supply at the Frenchman River Gauge at Culbertson.

   Without diversions into Culbertson Canal and without releases from Enders.

Irrigation Alternatives

1. **Frenchman Valley ID Only** - Using future water supply at Culbertson Diversion Dam (from 2 above), what reduction in allocation would be required to supply the Frenchman Valley Irrigation District project irrigators with a minimum of 6 inches of water per acre. (assuming 65% of releases from Enders Reservoir reach Culbertson Diversion Dam, and assuming a delivery efficiency of 50%)

Example – to supply 3 inches per acre from Enders (assume 3 inches/acre from natural flow)

3 in/ac X 9295 acres / 50% delivery efficiency / 65% water released reaches div. dam

7,150 AF of Enders – to deliver 3 inches per acre to FVID only

2. **Frenchman Valley ID and H & RW ID** - Using future water supply at Culbertson Diversion Dam (from 2 above), what reduction in allocation would be required to supply both the Frenchman Valley Irrigation District and the H & RW Irrigation District project irrigators with a minimum of 6 inches of water per acre. (assuming 65% of releases from Enders Reservoir reach Culbertson Diversion Dam, and assuming a delivery efficiency of 50%)

   Example – to supply 3 inches per acre from Enders (assume 3 inches/acre from natural flow)

   3 in/ac X 20,990 acres / 50% delivery efficiency / 65% water released reaches div. dam

   16,146 AF of Enders – to deliver 3 inches per acre to FVID and H&RW ID

Recreation Alternatives (Enders elevations of 3089.4, 3099.0)

1. **Elevation 3089.40** - What reduction in allocation would be required to meet and/hold Enders Reservoir at elevation 3089.40?

   Estimated 4,900 AF inflow needed to sustain Enders elevation of 3089.40 (to offset evaporation losses and seepage losses).

2. **Elevation 3099.00** - What reduction in allocation would be required to meet and/hold Enders Reservoir at elevation 3099.00?

   Estimated 6,200 AF inflow needed to sustain Enders elevation of 3099.0 (to offset evaporation losses and seepage losses).

Combination – Irrigation & Recreation Alternative

1. **Elevation 3089.40 & FVID only** - What reduction in allocation would be required to meet and/hold Enders Reservoir at elevation 3089.40 and supply FVID with 3 in/ac?

Estimated 4,900 AF inflow needed to sustain Enders elevation of 3089.40 (to offset evaporation losses and seepage losses) and from example above, an additional 7,150 AF from Enders needed to supply 3 in/ac to FVID.

2. **Elevation 3089.40 & FVID and H&RW ID** - What reduction in allocation would be required to meet and/hold Enders Reservoir at elevation 3089.40 and supply FVID and H&RW with 3 in/ac?

   Estimated 4,900 AF inflow needed to sustain Enders elevation of 3089.40 (to offset evaporation losses and seepage losses) and from example above, an additional 16,146 AF from Enders needed to supply 3 in/ac to FVID and H&RWID.

3. **Elevation 3099.00 & FVID only** - What reduction in allocation would be required to meet and/hold Enders Reservoir at elevation 3099.00 and supply FVID with 3 in/ac?

   Estimated 6,200 AF inflow needed to sustain Enders elevation of 3099.00 (to offset evaporation losses and seepage losses) and from example above, an additional 7,150 AF from Enders needed to supply 3 in/ac to FVID.

4. **Elevation 3099.00 & FVID and H&RW ID** - What reduction in allocation would be required to meet and/hold Enders Reservoir at elevation 3099.00 and supply FVID and H&RW with 3 in/ac?

   Estimated 6,200 AF inflow needed to sustain Enders elevation of 3089.40 (to offset evaporation losses and seepage losses) and from example above, an additional 16,146 AF from Enders needed to supply 3 in/ac to FVID and H&RWID.

Groundwater Recharge Alternative

Modeling results from above alternatives could be used to analyze the groundwater recharge alternatives.

1. Utilizing natural flows only
2. Utilizing natural flows and occasional Enders Releases.
3. Using only existing distribution system
4. With possible additional recharge storage facilities along existing distribution system.
5. Determine area benefiting from recharge.

Mike Thompson

From: Steve Gaul [sgaul@dnr.ne.gov]
Sent: Thursday, July 20, 2006 7:57 AM
To: Paul Koester ; Kevin Schwartman
Cc: Mike Thompson
Subject: FW: Frenchman Valley Appraisal Study - Modeling

Frenchman
ley Appraisal St

Paul and Kevin -

We are having a meeting on the Frenchman Valley Study this afternoon at 2 PM in the large DNR Conference Room. I would appreciate it if you could attend even though I know this is short notice. I have placed a Plan of Study for the Appraisal Study on your chairs and we will be discussing some of the modeling/scenarios in the attachment to Jack Wergin's e-mail. We will be trying to find the best ways for analyzing what the future of Enders and its water would be under a variety of scenarios. We are trying to determine what it is possible for agencies to analyze given time and budget constraints. I'll try to talk with you about this this morning. It will probably be just Jack, but possibly Jack and Jill Manring attending for Reclamation - so it should be a fairly small group. I look for the meeting to last 1 to 2 hours.

Steve

-----Original Message-----
From: Jack Wergin [mailto:JWERGIN@gp.usbr.gov]
Sent: Tuesday, July 18, 2006 3:02 PM
To: sgaul@dnr.state.ne.us
Cc: Jill Manring; Michael Kube
Subject: Frenchman Valley Appraisal Study - Modeling

Steve,

As I mentioned in our phone conversation, I was hoping we could get some estimates for some of the modeling needs for the study.

If we get the estimates, our current plan to utilize FY06 funding would be to enter into a cooperative agreement with the Nebraska Department of Natural Resources for the modeling needs. Our fiscal year ends September 30th, and we will need some lead time for completing the cooperative agreement.

I've attached a description of some of the alternatives with my shot at the initial modeling needs for these alternatives. I believe as this study develops we will identify additional modeling needs, which could be funded through modifications to the cooperative agreement.

If you can contact your modeling consultant and see if you can come up with an estimate for the modeling.

Earlier this year, in my discussions with Mark Phillips, the model may have to use the groundwater model (Republican River Compact Model) as input for a surface water model.

I will plan on meeting with you to discuss these issues at 2:00 on Thursday at the Nebraska DNR Office. I am flexible on this time so if you need to slide the time just let me know.

Let me know if you have any questions.

See you Thursday.

Jack

Mike Thompson

From: Steve Gaul [sgaul@dnr.ne.gov]
Sent: Tuesday, July 18, 2006 3:35 PM
To: Ann Bleed; Mike Thompson; Jeff Shafer
Subject: FW: Frenchman Valley Appraisal Study - Modeling

Frenchman
ley Appraisal St

Ann, Mike and Jeff -

Jack Wergin called earlier this afternoon and indicated he would like to start working on the modeling related effort that would be taken on as part of the Frenchman Valley Study. He mentioned he would like to stop by later this week (we agreed to 2 pm Tuesday) and talk about when to contact the modelers and what we may want to have the modelers accomplish. He said he would send an e-mail with his initial ideas and I have attached what he just sent. I am going to ask that Mike sit in on the meeting. I am not sure that all of the items he mentions can be done with existing models or at a cost of $220,000 or less. Certainly there would need to be a lot of caveats. However, if we are going to do this study, we will need to contact the modelers soon. I would appreciate any thoughts you have.

Steve

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