

Kearna
NRDs

3-25-03

Kearney 8:30 AM Rep. Riv. NRD's & DNR
March 25, 2003

- ① "Basin Association" - going well
- ② Adjudication Hearings - Above Harlan ~80% SFC permits Cancelled
- about 110 permits adjudicated

③ Certifying Acres from wells

a) Sources of Info about irrigated acres

- | | |
|------------------------|---------------------------|
| a) owner testimony | d) fsa aerial photography |
| b) fsa records - paper | e) satellite |
| c) County records | f) field investigations |
| | g) crop insurance records |

b) needs to have been irrigated between 1998-2002

Unless it was in a 10 year crop program

- i) What if sfc irrigated on same acres + let well sit idle because sfc was more plentiful & cheaper

Roger is leaning toward letting them switch to wells
Ann says it should be "OK" if not expanding

- ii) Wells put in in 2002 -

Proposed MNRD - no more than 160 acres per well

- If irrigated between 2003 + 2008 then they

keep what they actually irrigate

- ONLY 5 or 6 drilled in 2002, 100 since 1-1-2001

LRNRD - 300 new drilled in 2002

- iii) Certify Acres to a well or Group of wells

★ Roger is going to send a letter to NRD's about Acres

- iv) Integrated Management Program under "option 1" LB108
+ promulgate rules to manage sfc & gw together
(According to Jim Cook)

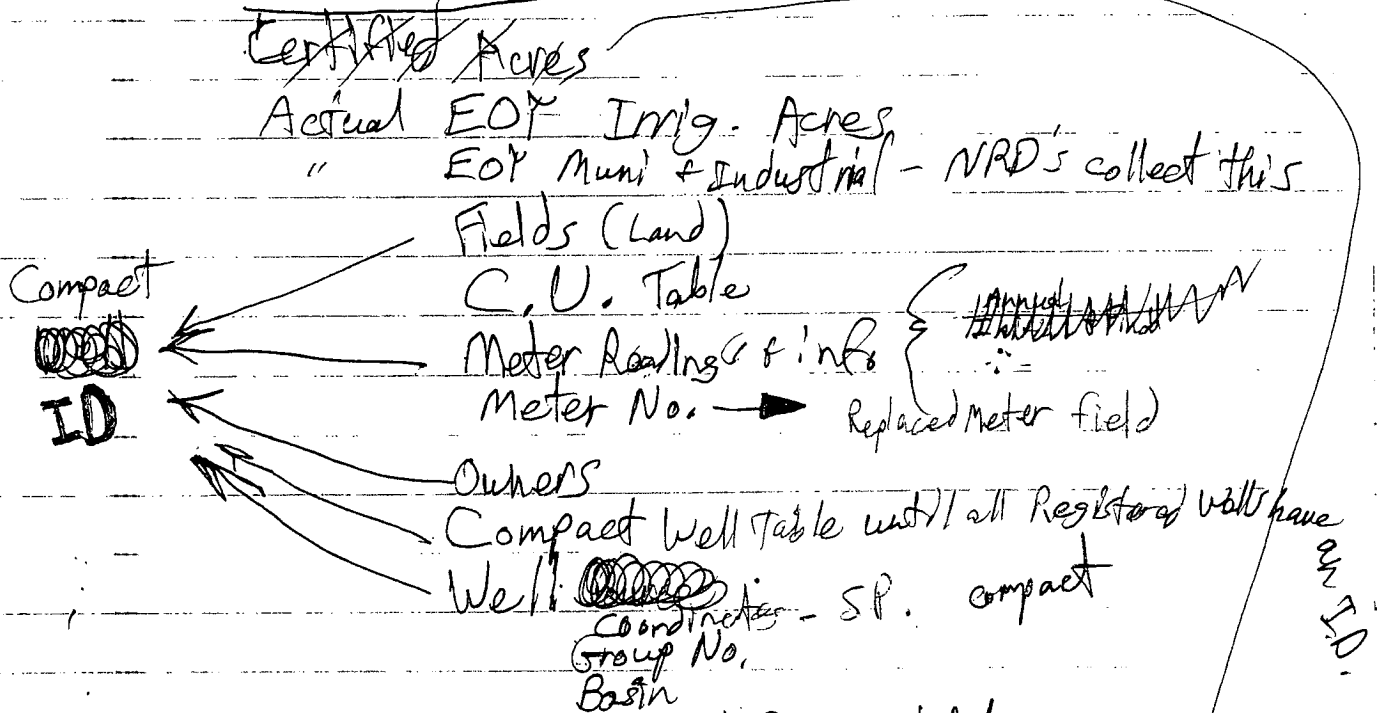
MRND
TABLES
Design

4-1-03

Wells Database -

Lat-Lon → update - procedure for GLW Lincoln to update coord.
 Ownership Process → Add authority to NRD's ASK Kim about
 sign. requirements for well Reg.

Tables



*Underlines below indicate a field required for the database

Compact Table		No. of wells	Certified Acres
<u>NRD</u>	<u>Type</u>	Auto gen to check validity of well group info	
What about a well in one NRD + use in another?	Irrig. Comm./Indust. Muni.		Rapid Resp Alluvial Y/N? Trenton West Y/N? Below Substrat Y/N?
Answer → this field is for the NRD that pop only use	Stock? > 300gpm		→ Lump by code into one field
Special Sub-Area for NRD Action	Agriculture	Exempt Y/N	

Ann +
Roger

5-5-03

Monday 8:15 AM May 5, 2003 Summer Interns

① ★ Annual Work Plan for 2003

② Certified Acres - Definition

Reg. Well & GPS Procedure Kit

- Get Agenda Items from managers by Friday

For 2003 use 2002 methods + start using Water Data

★ Tom Riley - Data needs for Model

- KS vs NE Data base Cont.

- Will do 2002

NRD requirements for Data?

③ ★ How will you cut back, if some expand
2002 Base → evenly distribute

→ if an NRD expands after 2002, then
a cut back (based on CIR) will
be applied in proportion to their
expansion

'84-94
312,000 AF
"Summary of
CU by
NRD"
slide that
Roger had

④ (AB - CIR is Not the Depletion) How work

Total Acres by NRD for Friday			
Alluvial Upland SFC Water -			
1.1	0.8 upland wells	160,000 alluvial 140,000 SW	guess new acres Hartex - Cambridge below Hartex Private Rights

★ April 30 + June 30 Reports - Appendix B
Tracking System - Jennifer

⑤ Coordinating Body
⑥ Susan Secured meeting

Depletions vs CIR → over time it will affect the River

Martin
Mtg
5-8-03

5-8-2003 FWG + Darrel Martin

Irrig Acres - $\left. \begin{array}{l} \text{GW} \\ \text{SW} \\ \text{GW \& SW} \end{array} \right\}$ Based on NAS

? URNRD Certified is significantly more than NAS acres

NAS underestimates Acres & Yields
Planted vs Harvested

① Acres - migrate to mapping & reporting irrigated fields
from NAS figures

② Pumpage Est.

(a) Power records used to derive the time of pumping

(b) Registered Flow Rate vs actual was tested
for ~ 200 wells

hours x rate = volume

Tri-Basin NRD could use Central Platte
method of hours times pump rate

③ Water Source

Before meters are read - we need to ID the land

④ Water Bodies - HDR + SORGO

NE Rep
Riv Mang
Districts

5-21-03

Agenda
Item Number

Nebraska Republican River Management Districts Association
May 21, 2003 10:00 AM Holdrege NE

- ③ ✓ Agenda Approved
- ④ ✓ Minutes Approved

Meeting Begins -

⑤ Patterson - explanation of additional members to NRRMDA
- RR Council, Recreation, Municipal etc.

Hipple - Motion to Accept new Advisory Delegates to NRRMDA
- No Discussion offered

- Motion Approved ^{sp. note? - Imperial} ← Motion to Accept; carried

Municipal - 1 ^{Hopland - Alma} delegate and 1 alternate will be selected

County Govt. Fred Trasper " → T.B. Announced

⑥ @ Patterson - Settlement Approved Monday May 19, 2003
model should be ready

Edgeton - Adj. update
- Above Harlan have received their orders or Draft transfer where a is needed
- Below Harlan orders pending & shut off orders will be enforced as needed

We must now implement the Settlement

Meter Cost Share

Coordinator hired

Modeler to be hired

Compact Mtg in Alma Aug 21 + 22 (maybe) at the Johnson Center

Model explanation in June for the non-experts

Dry Year Consumptive Use Plans to get approved

Collection of Data Must Start in 2003

LB/OP Joint Action Plan

⑦ John Thorburn - Flow Meters Rules being considered

- Bob Betger Mtg in Cambridge - ^{Retire irrig. acres to wildlife habitat.}

- Delka is concerned about I.D. tax role being impacted by the retirement package

Mike Clements - June 12 board mtg. - Rules + Regs. about

- SW Committee guidelines on certification of acres
- will be publishing info. in Paper about potential Rules

market price + meters + permit process for replacement

175
NOZZE
etc.

Brad B. v
Mike T.
Work List

cut

5-29-03

May 29, 2003 Brad Edgerton + Mike Thompson

Job list for Summer 2003

① Cambridge Canal "Map Transfer" Bartley Canal
Red Willow Canal } Well Irrigation in 2003
Meeker - Driftwood Canal }

Culbertson Canal (FV)
Culbertson^{Ext} Canal (H+RW) } =====> At least well find out <===== where they "can't" use GW

- Tasks -
- a) GPS Turnouts
 - b) Locate laterals, waste ways, buried pipes, siphons
 - c) delivery system (many new pivots) - nozzle type etc.
 - d) GPS wells inside District
 - e) GPS pivot center, end, note corner unit

② Digitizing Water Rights + Scanning

e. Gather, Sort + Reorganize previously scanned maps

a. 1995 Adjudication

Above Swanson Res.

Frenchman Creek

b. scan + Rectify Maps for 2004 Adjudication

c. scan + rectify District Maps

FURNAS
COUNTY
OFFICES

5-29-03

Furnas County -

FSA Slides - Looking for Pivots

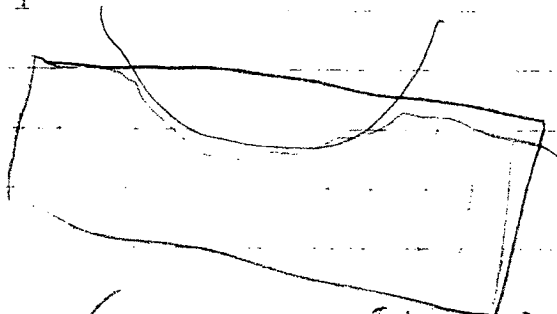
Have used FSA records - Don't think FSA really cares
before 2003 whether it is irrigated or not.

Hitchcock - Has driven whole county

Carolyn Wentling

Furnas AR @ atjeet.net

FSA



whole field - Acres #
irrigated
+ not by
report farmers

(No Info on ^{Irrig.} Grass)

"Sod busting" report

At least 4 pivots for grass to run cattle

Reuse of Hog Waste water → Meter Placement

Ann +
Roger
Pub. Mtg.
Pref.

6-5-6-03

June 5 - Roger & Ann + GW Modelers

Roger on the hearings on LBOP determination
Court decision is already prescribed
by the Court Settlement

Ann - Power Point on Settlement + tweak
18th + 17th

And do same thing on 24th + 25th
before the hearings

!!! Be real careful about treatment of
Adjudication question

Briefing Needs to be cooked + canned soon.

Modelers Data Gathering Questions -

seep runs on mound water?

Base flow + piezometers on streambeds in Mainstem
→ regular spacing + intervals over years

Summer 2003 - pump sampling in mound area

- comingled

- alluvial meter numbers

Martin Precip. Approach - credit for slow runs incorrect recharge
because wet fields recharge more than dry
This an accounting issue, not a modelling issue

GW Brief
for NRDs
in Holders

7-24-03

July 24, 2003 Holdrege, NE 10:00 AM

GW Model Briefing with Republican River NRD's

Mike McDonald - Describe GW System
Physical System RRCA^{Model} by Global Water Budget - Inflow
- outflow
~~Precip~~ Precip: Red Cloud Area seemed to have more impact in drought of the 30's than the imperial area

STATS GO - ~~water~~ divided into 3 soil types + Modellers

- ① ~~Coarse~~ Fine
- ② Medium
- ③ Coarse

Recharge is affected by soil type

Usually less than 1" in areas w/ fine soil

Canals - 3 groups for seepage analysis - canals, irrigated land, lakes

- ① Platte Canals - western ①
- eastern ②
- ② Republican Canals

Irrigation well density

Irrigated Acres density

Phreatophyte Distribution

~~Potential~~ Potentiometric Surface (velocity vectors of flow)
Water Level Changes

Model - Inputs + Outputs List

Baseflow Water Levels

↳ component of river flow that is derived from GW infiltration
Precip. * recharge curves - irrig. land has more recharge
for same soil

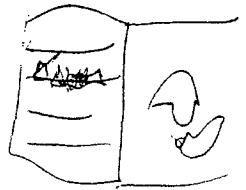
DNR 11/9
W/11/10/03

7-25-03

★ Need to get shapefiles w/ completion dates

★ Install Hatch Set at MRNRD → email

Aug 15 Next Meeting

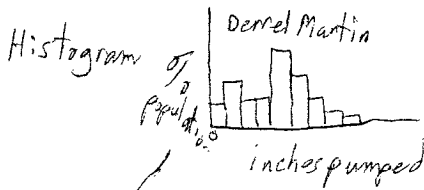


July 25, 2003 Mtg w/ GW Model Team @ DNR

Scenarios
Work Program
Schedule
Eleven Tasks

① "No Action" Run

Martin - Pumpage per well in 1981 and multiply by well for future wells by county. Use precip + SW recharge. Use 2000 Acres. ^{Really, 1992 acres} This would get a range of weather 1981-2000 and current development levels and then we could cut back pumpage to 12", 9", 6", 0" as requested by NRPS.



↪ because county average may be less than the scenario (i.e. 12, 9, 6, 0)

② "No Action" Run will be run with 10% increments of reduction, instead of specifying inches. Then Derrel's histogram info will be applied. 0% (100% reduction) will be run. Tri-Basin will be excluded, so only Lower, Middle + Upper will be affected.

115% → 0%

Model uses 80% of pumping as efficiency factor?

③ Quick Response Well Identification

- 1st Tier is if 75% of water pumped would get back to river in 1st year
Start with wells in stream cells
- 2nd Tier - significant effect in 3 years
Anything with less than a 50% effect in 3 years would not make any

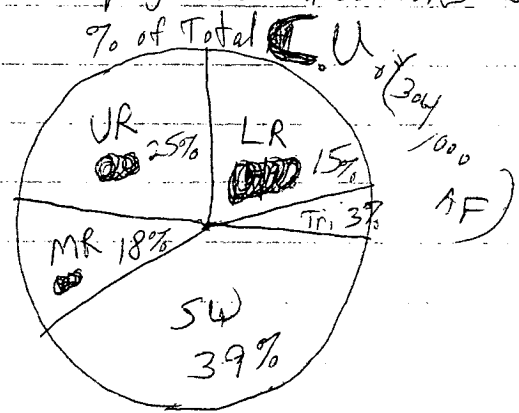
~~Accrual Curtailment Rpt~~ - won't be done ###

Next Meeting Between Modelers, DNR + NRD: Sept. 4 in Holdrege?

(Derive curves in areas for volume pumped vs allocations)
he will do "two translations" for ~~runs~~ runs 1-3

(Accounting sheet would then be applied (Ann will give draft to Mike med))

Next Generation of "runs" will need to separate SW & GW & then prorate the projected allocations by NRD.



Depletions (rough rounded)

- Up: 75,100 AF
- Mid: 55,000 AF
- Low: 45,000 AF
- SW: 100,000 AF
- Tri B: 10,000 AF

Total: 285,000 AF
 GW: 185,000
 SW: 100,000

Received during meeting on July 25, 2003
Notes are from this meeting + augment other
notes in yellow 8 1/2 x 11" notepad.

To: Ann Bleed
cc: Roger Patterson, Mike Thompson, Jennifer Schellpepper, Tom Riley, Marc Groff, Derrel Martin,
Mike McDonald, Larry Land, Jerry Kenny
Date: 7 July 2003
Re: Update of the regional ground water model and 2003 accounting

The regional model must be updated through 2003 in order to be used for official accounting purposes. All three states must provide data, and presumably at least some of the work will be done by the modeling committee. This memo focuses on Nebraska's work program, but we should begin to give thought to an appropriate process and schedule for the multi-state effort. In particular, it seems like the process should include road-testing of the user's manual and accounting manual (being drafted by Barfield?).

In addition, if funding permits, I would hope the update process will allow for an initial evaluation of model performance (verification against actual data) as well as consensus changes to clean-up the files. The verification process could include (for example) comparisons against the synoptic baseflow data base, the "headwater location" data base, and Cohyst. We might also coordinate the update with Tom's "legacy" assignment, i.e. final organization and documentation of all model inputs.

Unless there is some other method available to us, input data for 2001-2002 must be generated using the same methods that were applied for 1940-2000. In particular this means that Derrel and Marc need to make pumping estimates, and Jerry needs to provide the surface water files. A unique circumstance for the update that didn't apply to the prior modeling is that we can coordinate the 2001-2002 update with the collection of "actual" 2003 data (see below), which in turn should help determine whether there are major problems in the 1940-2000 inputs.

The model inputs for year 2003 are to be obtained in a manner that conforms exactly with the specifications in the accounting section of the settlement, which in turn means they are to be obtained through field observations or otherwise reflective of actual measurements. Moreover, for 2003 we also need to gather the data that will be used in surface water accounting (i.e. not just the model). My understanding is that Mike Thompson has been actively working to organize and implement the data gathering effort for 2003, with close involvement of the NRDs. My assumption is that he is aiming at some type of master data base (with meta-data) that provides the structure for years to come. When we gather in Lincoln later this month, it would be great to get a report on his work.

In the meantime, for the benefit of all, here is a reminder of what the accounting requires us to do (cribbed from a memo on the same subject I wrote to Jennifer last January).

1. Surface water diversions and irrigated acreage. Each State will tabulate the canal, ditch and other surface water diversions that are required by RRCA annual compact accounting and the Republican

For Platte - C.N.P.P.I.D. (20) } meet
(Central Platte NRD) N.P.P.D. }
+ 30 mile etc }

Jerry Kenney H.D.R.
Denver

May need to finish canal investigation & those areas of individual rights not already adjudicated.

Brand Muni. + Ind.

Platte River Reservoirs - separate section see 6 below

Ground Water Model on a monthly format (or a procedure to distribute annual data to a monthly basis) and will forward the surface water diversions to the other RRCA participatory States. Each State will provided the water right number, type of use, system type, location, diversion amount, and acres irrigated. (Item 6 below is in addition.) (Note, it is my great desire that we get co-mingled acres correctly identified for 2003. Note that we also need to gather data related to surface water returns.)

Meters

Split Compact IDs by 4 NRD's - use meter tags

2. Ground water pumping and irrigated acreage. Each State will tabulate and provide all ground water well pumping estimates that are required for the Republican Ground Water Model to the other RRCA participatory States. Nebraska's specific assignments are to provide an annual tabulation through the representative Natural Resource District (NRD) in Nebraska that includes: the well registration number or other ID number, ground water pumping determined by a meter on each well (or group of wells in a manifold system) or by reported hours of use and rate; and well information -- location; system type (gravity, sprinkler, LEPA, drip, etc.); and irrigated acreage. Irrigated acreage by crop will be provided on a county basis. (I'm not sure if we are expect to use the system-type data for 2003 to calculate an "actual" ground water return coefficient.)

get rate readings from NRD's for non-metered Wells

3. Climate information. Each State will tabulate and provide (available data on) precipitation, temperature, relative humidity or dew point, (average wind speed) and solar radiation for specified climate stations. (Note that there needs to be some calculations of phreatophyte ET from these data. We don't have to, but may want to revisit the subject of acreage and locations.)

4. Crop Irrigation Requirements. Each State will tabulate and provide estimates of crop irrigation requirement information on a county format. Each State will provide the percentage of the crop irrigation requirement met by pumping; the percentage of ground water irrigated lands served by sprinkler or flood irrigation systems; crop distribution; crop coefficients; gain in soil moisture from winter and spring precipitation, net crop irrigation requirement; and/or other information necessary to compute a soil/water balance. (Note that this obligation doesn't really fit with how the model ended up being developed, but we are stuck with it nonetheless.)

MLT,

5. Streamflow Records from State-Maintained Gaging Records. Streamflow gaging records from specified State maintained gages. (The multi-state group and/or the accounting committee will need to get the federal records. For verification purposes, it would be useful to extend the baseflow targets, but this isn't essential.)

6. Platte River Reservoirs. The State of Nebraska will provide the end-of-month contents, inflow data, outflow data, area-capacity data, and monthly net evaporation, if available, from Johnson Lake; Elwood Reservoir; Sutherland Reservoir; Maloney Reservoir; and Jeffrey Lake. (I'm not sure if the accounting description fully captures what Jerry ended up doing.)

↓ ?

7. Water Administration Notification. The State of Nebraska will provide the information that describes the protection of reservoir releases from Harlan County Lake and for the administration of water rights junior in priority to February 26, 1948.

8. Moratorium. Each State will provide a description of all new wells constructed in the Basin upstream of Guide Rock (including the owner, location (legal description), depth and diameter or dimension of the constructed water well, casing and screen information, static water level, yield of the water well in gallons per minute or gallons per hour, and intended use of the water well.

9. Non-federal reservoirs. Each State will provide an updated inventory of reservoirs that includes the location, surface area (acres), and capacity (in acre-feet), of each non-federal reservoir with storage capacity of fifteen (15) acre-feet or greater at the principal spillway elevation. Supporting data to substantiate the average surface water areas that are different than the presumptive average annual surface area may be tendered by the offering State. (Will be important to ground-truth CO and KS data as we get allocations from this use. Also, for purposes of surface water accounting, we need to coordinate with the other states regarding federal reservoir data.)

10. Modflow input files. Each state will provide monthly ground water pumping, surface water recharge, ground water recharge, and precipitation recharge indexed to the one square mile cells, and summarized by County.