LOWER PLATTE SOUTH
natural resources district
3125 Portia Street | P.O. Box 83581 • Lincoln, Nebraska 68501-3581
P: 402.476.2729 • F: 402.476.6454 | www.lpsnrd.org

Memorandum

Date: February 9, 2023

To: Board of Directors

From: Mike Murren Projects Coordinator MM

Subject: Water Resources Subcommittee meeting minutes

The Water Resources Subcommittee met on Wednesday February 8, 2023, at 6:00 pm. Members present included Susan Seacrest, Bob Andersen, Larry Ruth, Melissa Baker, Luke Peterson, Don Jacobson and Gary Hellerich. Others present were Dick Ehrman, Paul Zillig, Dave Potter, Drew Rathovec, Mike Murren, Steve Herdzina and Maclane Scott all with the LPSNRD. There were three items on the agenda. No action was taken. The meeting was called to order by Director Seacrest at 6:00 p.m.

9A. Groundwater Refresher Presentation (PowerPoint Attachment)

Ehrman gave a presentation to the committee that covered many of the LPSNRD groundwater programs as well explaining the unique aquifers that we have in our district and management and well permitting requirements. Our district has both groundwater quantity and quality issues that is dealt with by using the latest technology and data collection to help with management of our district. Please look at the informational PowerPoint that is attached.

10B. Aquifer Test/Hydrogeologic Analysis Cost Share Discussion

Director Hellerich led a discussion on his request to establish a cost share program to help pay part of the Aquifer Test/Hydrogeological Analysis that is required for all class 2, 4 and 5 well applications. Staff uses results of both studies to help determine if the aquifer is sustainable and the impact to wells within the area. An attached draft cost share proposal (Water Well Permit Study Assistance Program) was handed out to committee member's and discussed. It was decided to postpone any decision on this request, and it will be brought up at a later time.

10C NDEE/319 Drinking Water Protection Specialist Position

Ehrman updated the committee on the status of the new drinking water protection specialist position the board approved a few months ago. The project implementation plan (PIP) has been finalized and sent to EPA Region 7 for their approval. Once approval of the plan is received from EPA, the District can approve the plan and then can then advertise to fill this position.

With no further business the meeting adjourned at 7:44pm.

Enc.

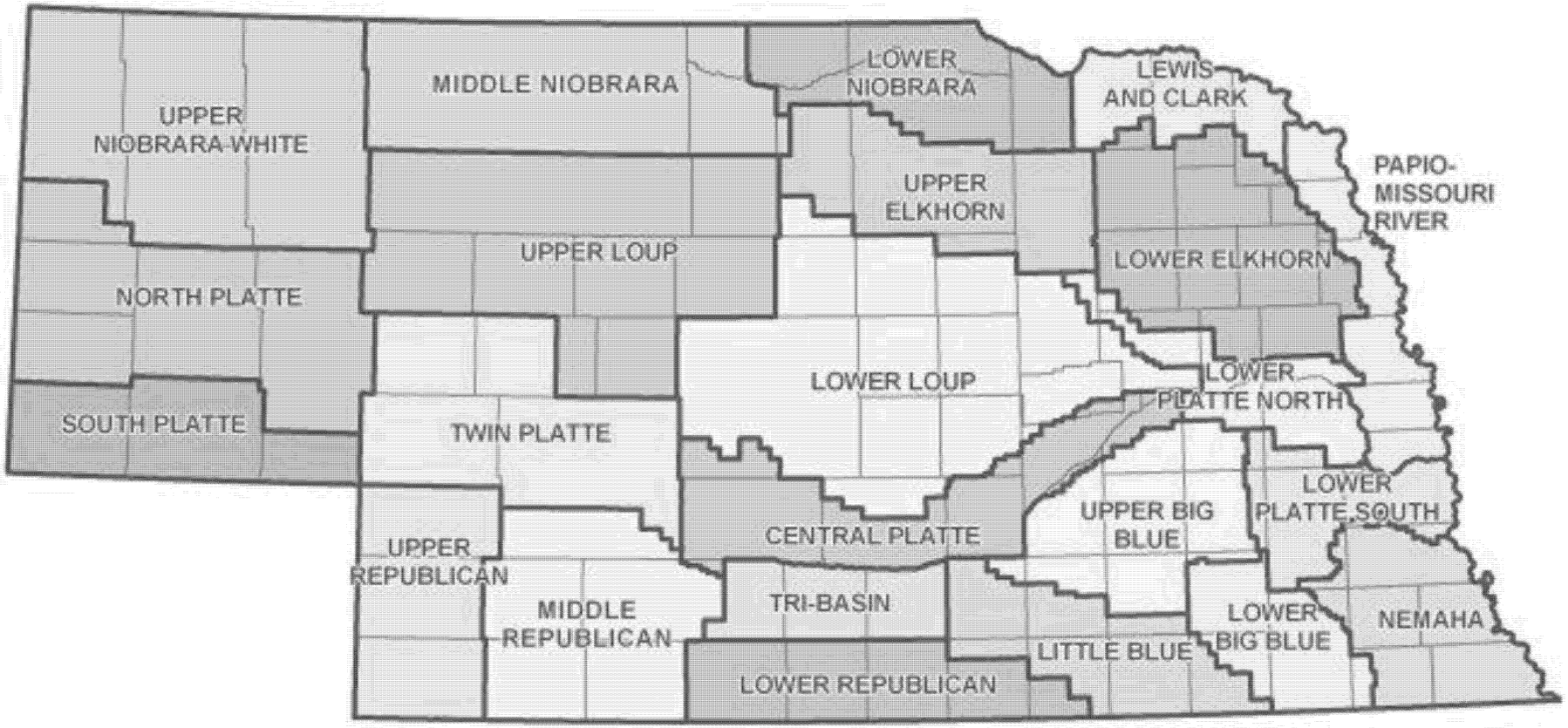
Cc: Steve Seglin

Corey Wasserburger

GROUND WATER "REFRESHER"

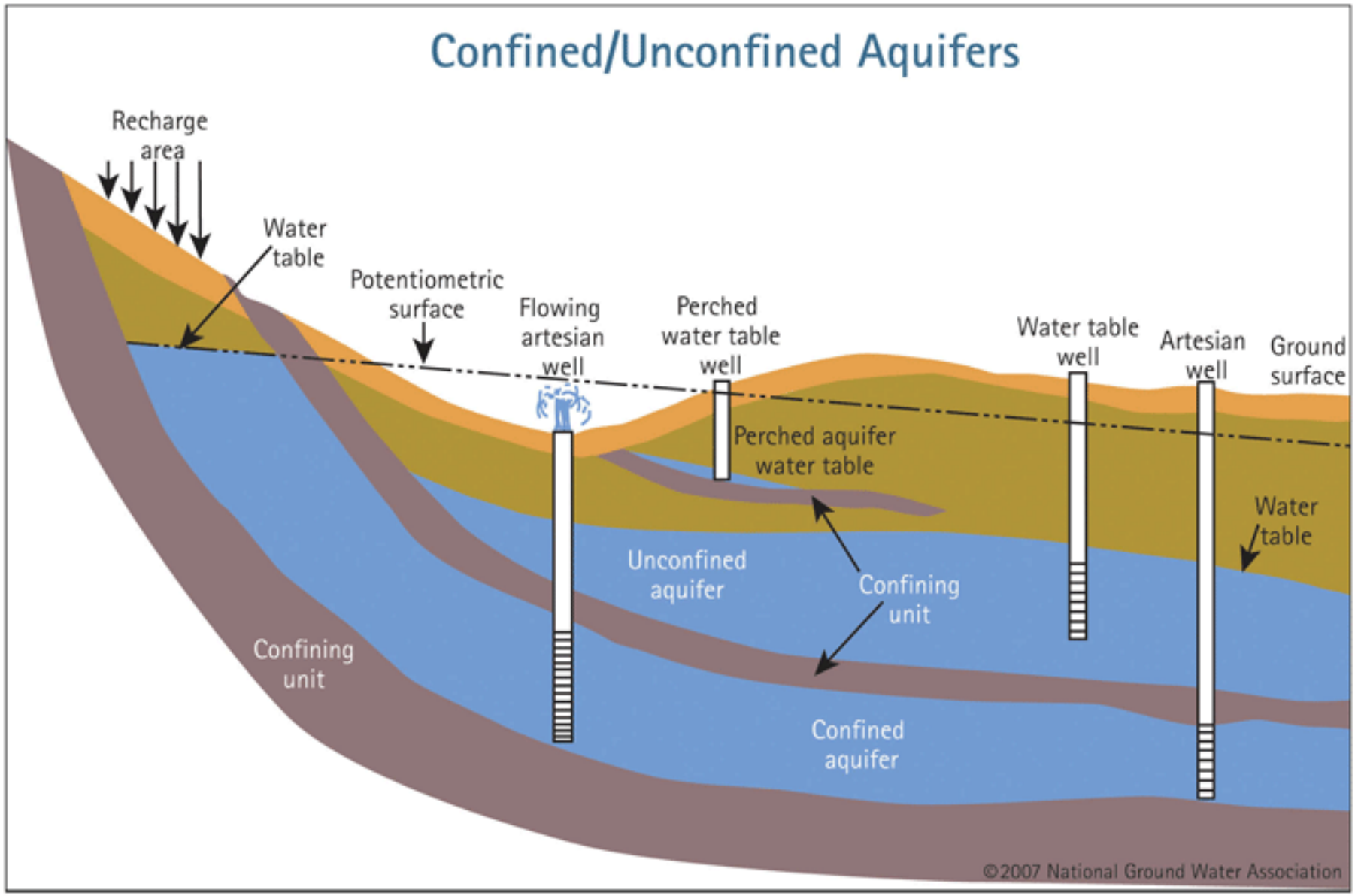
Water Resources Subcommittee

February 8, 2023

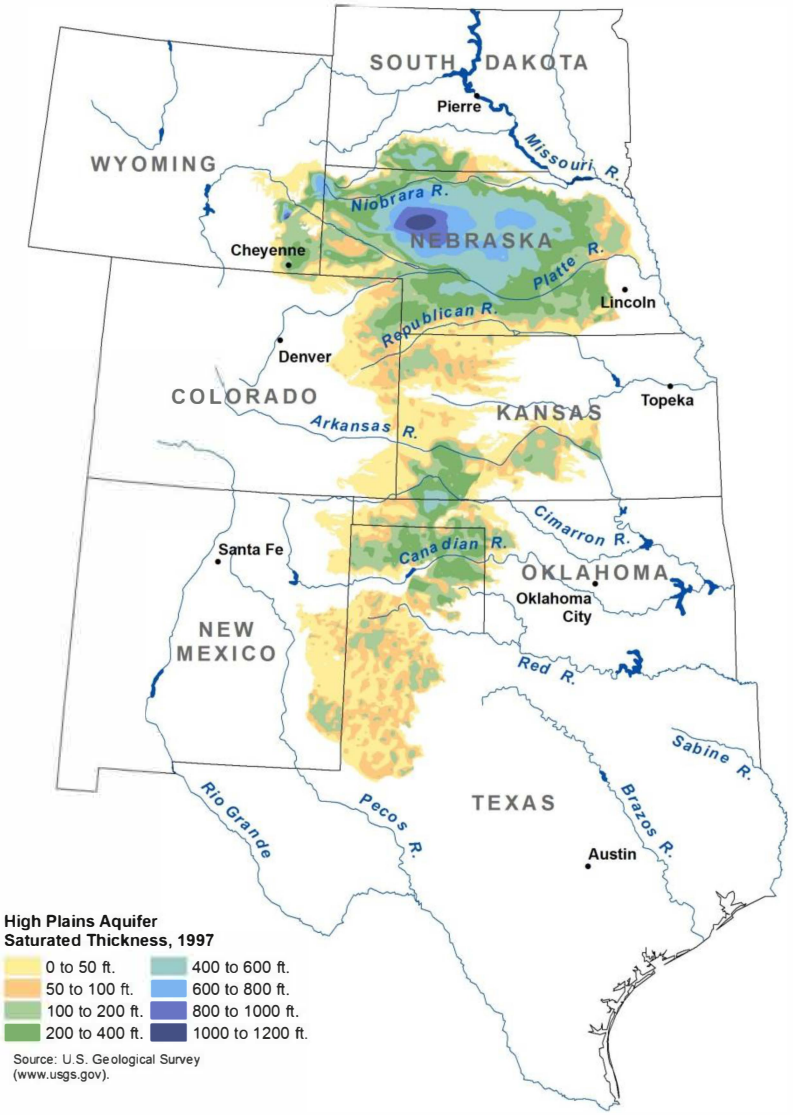

UPPER NIOBRARA-WHITE
MIDDLE NIOBRARA
LOWER NIOBRARA
LEWIS AND CLARK
PAPIO-MISSOURI RIVER
UPPER ELKHORN
LOWER ELKHORN
UPPER LOUP
NORTH PLATTE
LOWER LOUP
LOWER PLATTE NORTH
SOUTH PLATTE
TWIN PLATTE
LOWER PLATTE SOUTH
UPPER BIG BLUE
CENTRAL PLATTE
UPPER REPUBLICAN
TRI-BASIN
MIDDLE REPUBLICAN
LOWER BIG BLUE
NEMAHA
LITTLE BLUE
LOWER REPUBLICAN

"**Ground water** shall mean that water which occurs in or moves, seeps, filters, or percolates through ground under the surface of the land, and shall include ground water which becomes commingled with water from surface sources."—LPSNRD Ground Water Rules & Regs

Aquifer: An underground geological formation able to store and yield water. (The Groundwater Foundation)



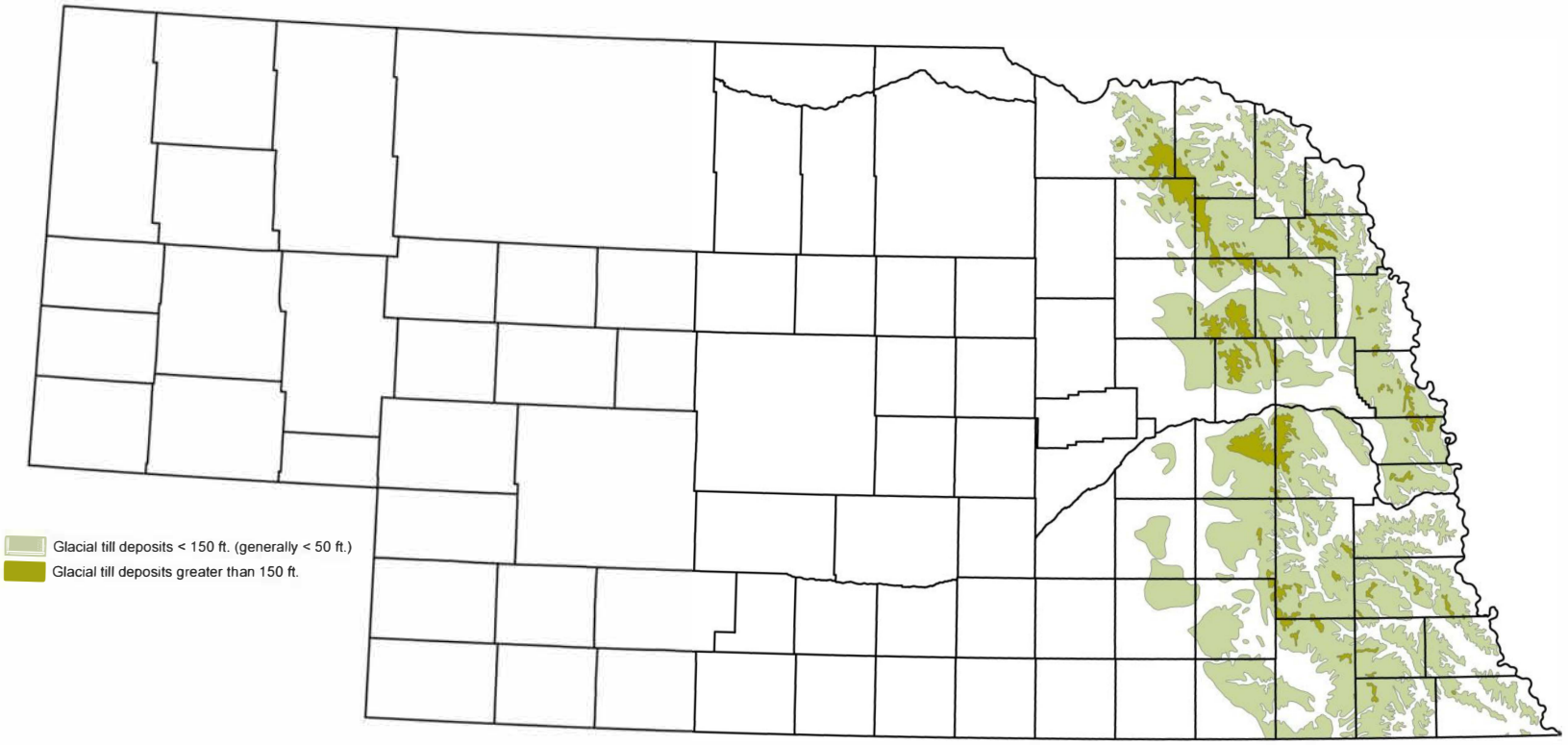
http://www.ngwa.org/Fundamentals/use/PublishingImages/aquifer_types.gif



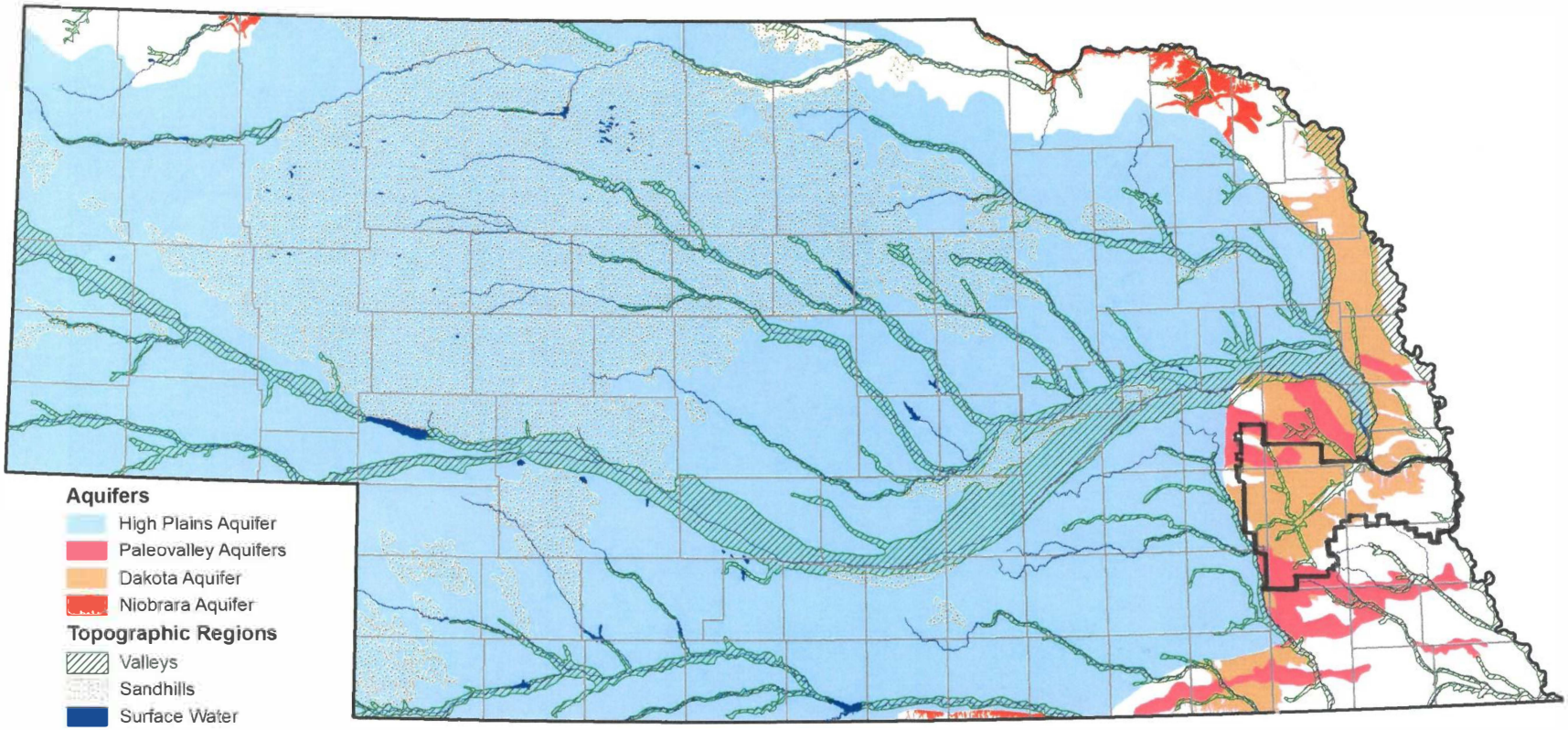
This map was produced by the University of Nebraska-Lincoln.
For additional information and an interactive version of this map
visit http:// water.unl.edu

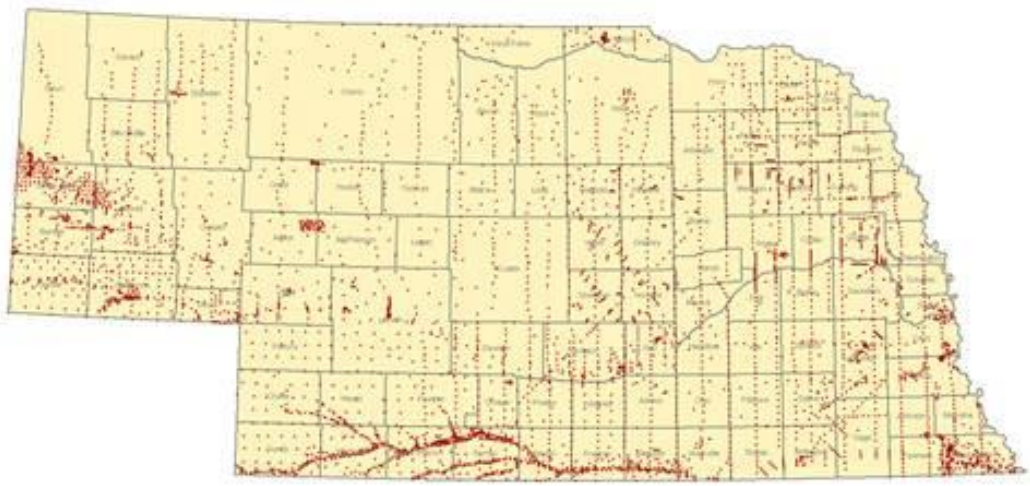
The information presented on this map is the best available as of July 2008. To order a copy of this map go to nebraskamaps.unl.edu. Any questions or comments

Glacial Till Deposits



Important Aquifers and Topographic Regions of Nebraska





6,000 Test Holes in Nebraska

>

Test-hole No. 20-B-44
(7N-6E-3BBBB)
Lancaster County

Legal Description: T7N, R6E, Sec 3, NW NW NW NW
Footages from Section Lines: South 6.0 ft; East 86.0 ft
Latitude: 40.610023 [40d 36m 36.082s]
Longitude: -96.743128 [-96d 44m 35.262s]
Source Lat/Long: GIS derived - Datum: NAD27
USGS Quad Map Name: Cortland
Nat. Res. District: Lower Platte South
Ground Elevation: 1340.0 ft
Source Elev: DEM
Depth to Water: 15.5 ft. (8-10-44).
Geophysical Log(s): No
Note: None

	Depth, in feet From	To
Quaternary System:		
Soil, no detailed description recorded.....	0.0	2.0
Silt, slightly clayey, sandy, reddish brown, sand is very fine to fine with a few coarse grains.....	2.0	5.0
Sand, silty, slightly clayey, sand is very fine to coarse with some very coarse, contains limestone nodules, limonitic fragments, and some fine gravel grains.....	5.0	20.0
Sand, very fine to coarse with some very coarse, contains some interbedded light gray silty clay layers.....	20.0	33.5
Till, clay, calcareous, sandy to gravelly, bluish gray.....	33.5	36.0
Sand, very fine to medium with a trace of coarser material.....	36.0	44.0
Till, clay, sandy to gravelly, calcareous, bluish gray, contains some thin gravel zones from 60 to 80 ft.....	44.0	113.0
Till, clay, very sandy to very gravelly, bluish gray, contains possible gravel layers.....	113.0	125.0
Sand and gravel, medium sand to fine gravel with some medium gravel (60 percent gravel), contains mostly coarse sand with some fine gravel from 130 to 135 ft, contains 50 percent gravel below 135 ft.	125.0	140.5
Till, clay, calcareous, sandy to gravelly, bluish gray.....	140.5	155.0
Sand, fine to very coarse with some fine gravel.....	155.0	169.0
Silt, slightly clayey, calcareous, bluish gray, contains some limestone fragments.....	169.0	185.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Sand, fine.....	185.5	190.0
Shale, olive gray to light blue, clayey.....	190.0	193.0
Permian System - Gearyan Series - Council Grove Group:		
Limestone, gray to pink.....	193.0	194.0

190,000 non-abandoned wells in Nebraska; **7,252** in LPSNRD

STATE OF NEBRASKA
DEPARTMENT OF NATURAL RESOURCES
WATER WELL REGISTRATION

Fee Paid $70.00 DNR Cash Fund $18.50
HHSS Fee $30.00 HHSS-DNR Cash Fun $0.00
Get Billing 13105

FOR DEPARTMENT USE ONLY

NOL ID 113354856516032 NOL Status Accepted Well Status A Registration Code G-137715 Add
Owner ID 14276 NOL Date 12/03/2005 Call Up Code Registration Date 12/05/2005
Seq Num 173053 Call Up Date

12052005 - 173053 -WWRF Page 1 of 3

1a Owner's Name
b Company Name Lower Platte South Natural Resources District
c Correspondent Name Attention Name Jesse T. Korus
Address PO Box 83581
City: Lincoln State NE Zip Code 68501 - 3581 Phone 402 - 476-2729

2a HHSS Contractor Lic ID: 16593903 Contractor's Name: Loren C.Taylor
Contractor's License No: 3919403 Contractor's Email Address:
b Drilling Firm Name Charles Sargent Irrigation Inc - Geneva
Address P.O. Box 367
City: Geneva State NE Zip Code 68361 Phone 402 - 759-3902
Drilling Firms Email Address sargentdrilling@alltel.net

3a Well Location NENE of Section 15 Township 13 North, Range 4 E (E/W), Butler County
b Natural Resource District Lower Platte South
c The well is 43 feet from the N (N/S) section line and 489 feet from the E (E/W) section line
GPS: or Latitude: 41 06' 14.70" Longitude: -096 56' 56.40"
d Street address or block, lot and subdivision, if applicable: Block No Lot
e Location of water use, if applicable (give legal descriptions) NENE S15 T13 R4E
f If for irrigation, the land to be irrigated is Acres
g Well Reference letter(s), if applicable DV#6

4 Permits

Permits	Permits Number	Date	Permits	Permits Number	Date
Management Area Permit			Transfer Out-Of-State		
Surface Water			Well Spacing		
Geothermal			Conduct Water		
Industrial			Municipal		
Industrial Transfer Notice			Other		

5 Purpose of Well Monitoring (Ground Water Quality) Other
Notes

6 Wells in a Series
a Is this well a part of a series?
b If one or more of the wells in the series is currently registered, give the well registration number
c How many wells in the series are you registering at this time?

7 Replacement and abandoned well information Replacement Number
a Is this well a replacement well? b Registration number of abandoned well
If not registered, date abandoned well was constructed
c Replacement well is feet from abandoned well. d Abandoned well last operated

12052005 - 173053 -WWRF Page 2 of 3

e Original well pump column size: inches. f Completion of original well abandonment on
g Location of water use of abandoned well

8 Pump Information
a Is pump installed at this time?
Is pump installed by well owner in section 1? Is pump installed by contractor in section 2?
Else installed by pump installer.
b HHSS Installer's License ID.
Pump Installer's License No. Pump Installer's Name
Pump Installer's Email Address
Pump Installer's Firm Name
Pump Installer's Firm Address
City: State Zip Code -0000 Phone -
Pump Installer's Firm Email Address
c Pumping Rate gallons per minute measured or estimated
d Drop pipe diameter inches e Length of drop pipe feet.
f Pumping equipment installed / / g Pump Brand
h This well will be used to pump less than 50 gpm ☑

9 Well Construction Information
a Total well depth 267. feet. b Static Water Level 231. feet.
c Pumping Water Level 248. feet. d Well construction began: 11 / 08 / 2005
e Well construction completed: 11 / 08 / 2005 f Bore hole diameter in inches. Top 10. Bottom 10.
g Casing and Screen Joints Glued Other

10 Well Construction (Casing and Screen)

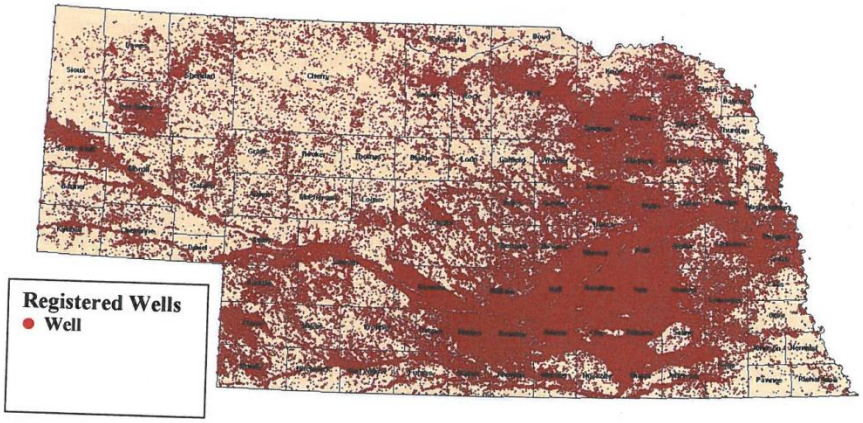
Fr Depth	To Depth	Case Scrn	In Diam	Out Diam	Thickness	Scrn Slot Size	Material	Trade name	NOLID
0	267	casing	4.00	4.50	0.25		PVC		113354856516
267	287	screen	4.00	4.50	0.25	.020	PVC	PVC	113354856516

11 Well Construction (Grout and Gravel)

NOL ID	From Depth	To Depth	GroutGravel	Material
113354856516032	0	260	grout	Bentonite
113354856516032	260	287	gravel	Chlorinated Gravel

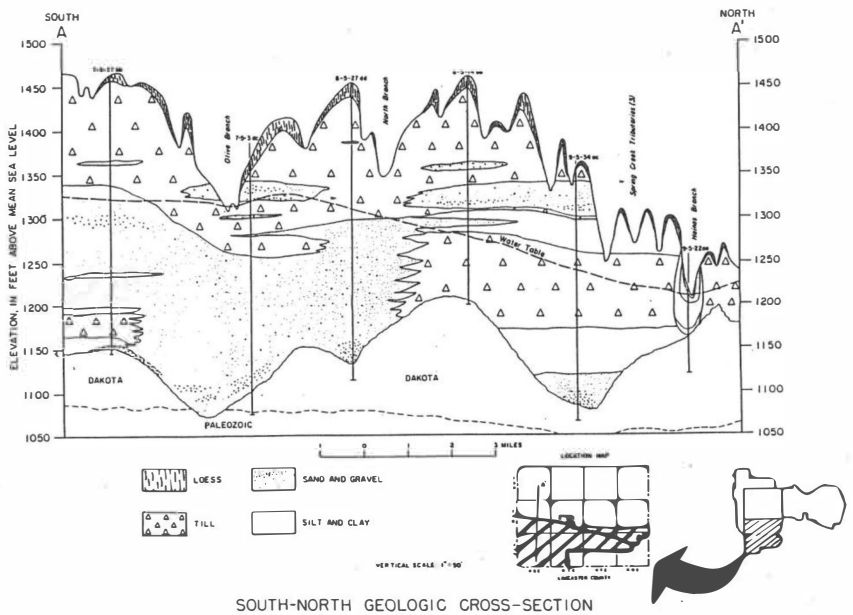
12 Geolog Material Logged

NOL ID	From Depth	To Depth	Description
113354856516032	0	20	Top soil and clay with limey clay streaks
113354856516032	20	40	Clay with lime clay streaks
113354856516032	40	74	Clay with cobbles
113354856516032	74	80	Blue clay with coarse sand and fine gravel streaks
113354856516032	80	120	Blue clay layers with coarse sand and fine gravel
113354856516032	120	146	Blue clay with coarse sand streaks
113354856516032	146	154	Fine to medium sand
113354856516032	154	160	Sandy clay and fine sand
113354856516032	160	200	Fine to medium sand with sandy clay streaks
113354856516032	200	220	Sandy clay with fine to medium sand
113354856516032	220	240	Sandy clay into sandy blue clay with fine sand
113354856516032	240	260	Blue and black clay



LPSNRD GW Management Plan

- Required of all NRDs since early 1990s
- LPSNRD's GWMP approved by State in 1995
- Phases for management of ground water quality and quantity
  - Phase I: Entire NRD; general I/E on ground water; well permitting, etc.
  - Phase II: Delineated for areas of management (GWRs & CWSPAs); required education
  - Phase III: Additional requirements/regulations to protect ground water quality & quantity



SOUTH-NORTH GEOLOGIC CROSS-SECTION
WESTERN LANCASTER COUNTY, NEBRASKA

LOWER PLATTE SOUTH
NATURAL RESOURCES DISTRICT

USGS
science for a changing world

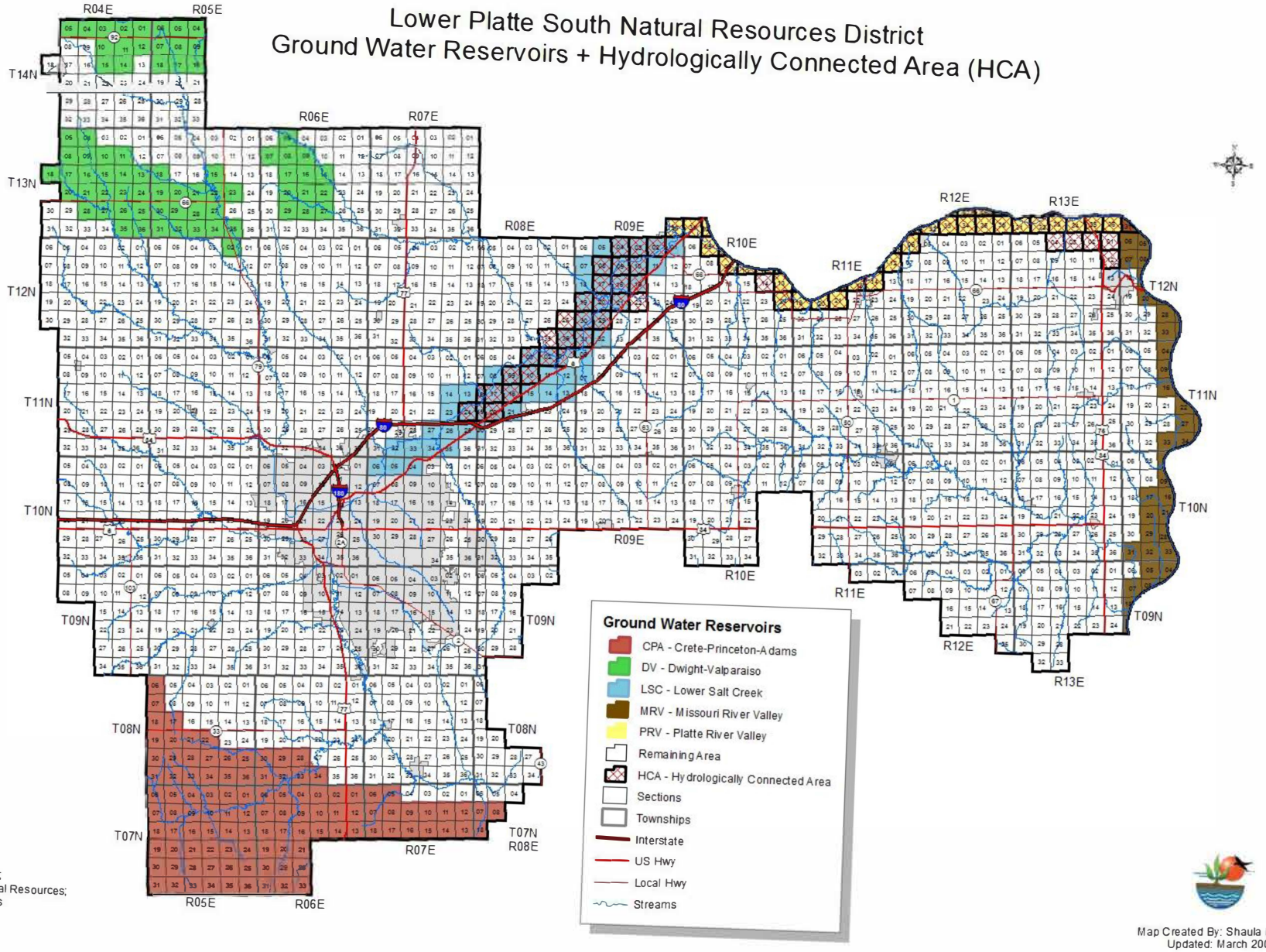
U.S. Department of the Interior
U.S. Geological Survey

Hydrogeology and Water Quality of Five Principal Aquifers in the Lower Platte South Natural Resources District, Eastern Nebraska, 1994

Water-Resources Investigations Report 00–4155

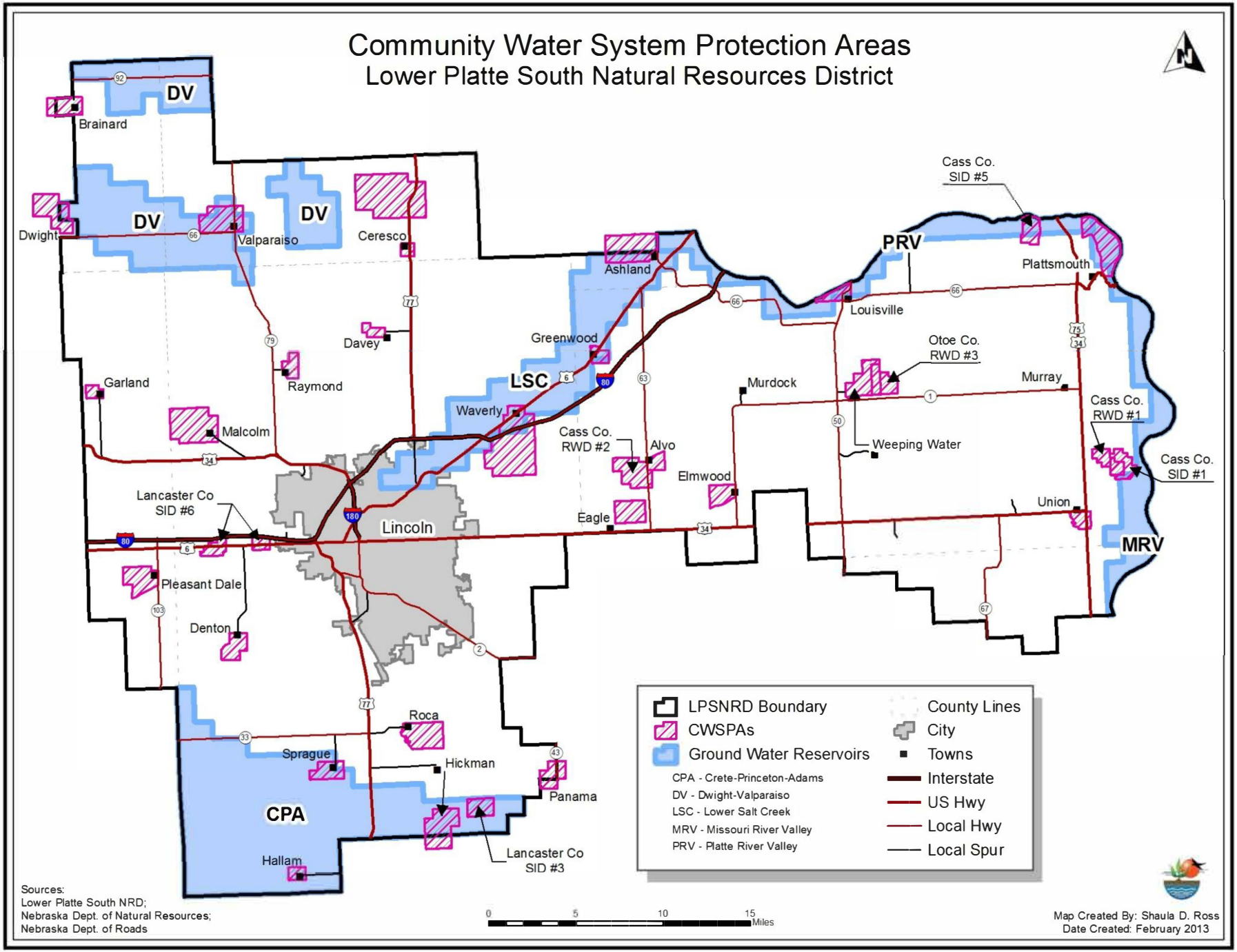
Prepared in cooperation with the
LOWER PLATTE SOUTH NATURAL RESOURCES DISTRICT

Lower Platte South Natural Resources District
Ground Water Reservoirs + Hydrologically Connected Area (HCA)



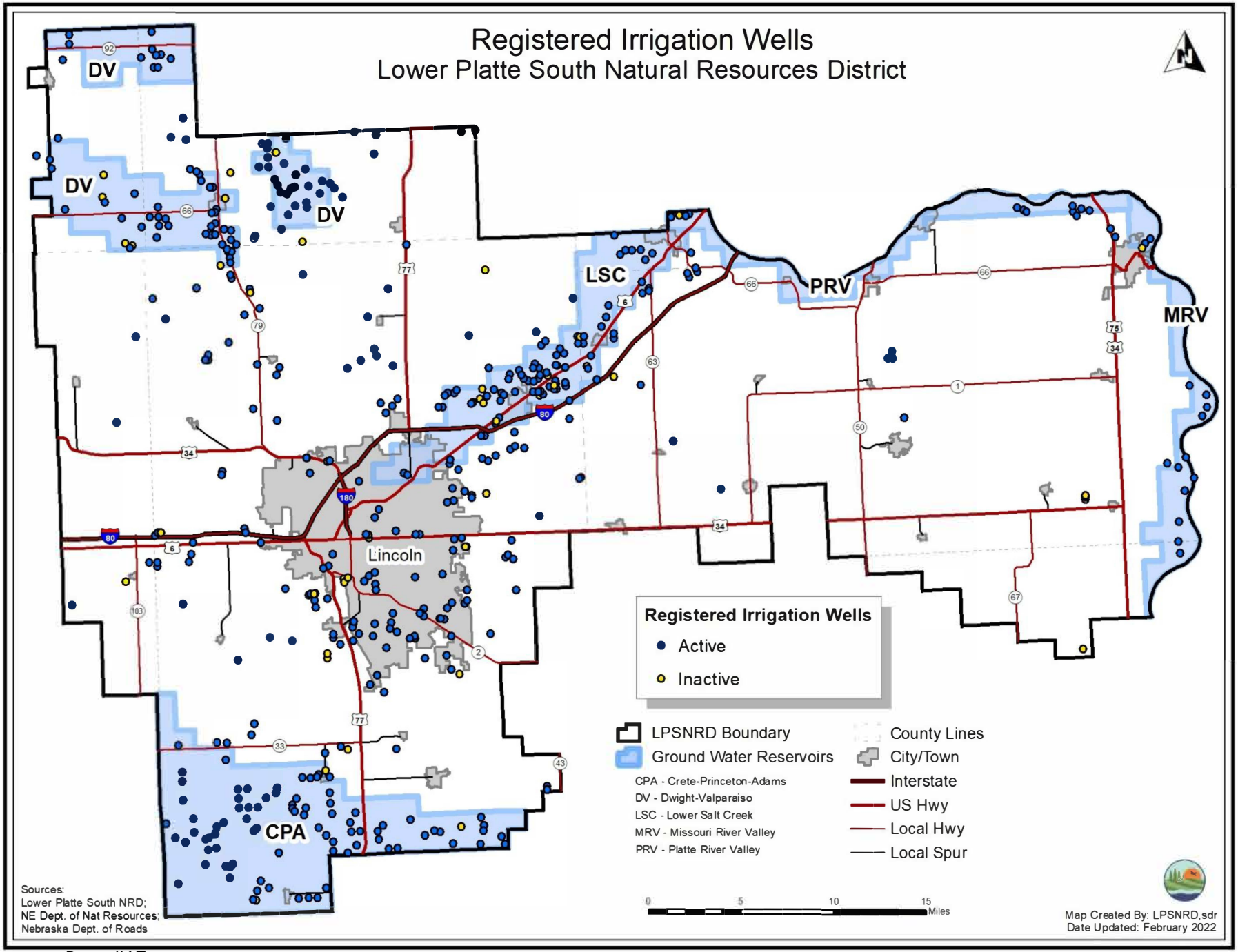
Sources:
Lower Platte South NRD;
Nebraska Dept. of Natural Resources;
Nebraska Dept. of Roads

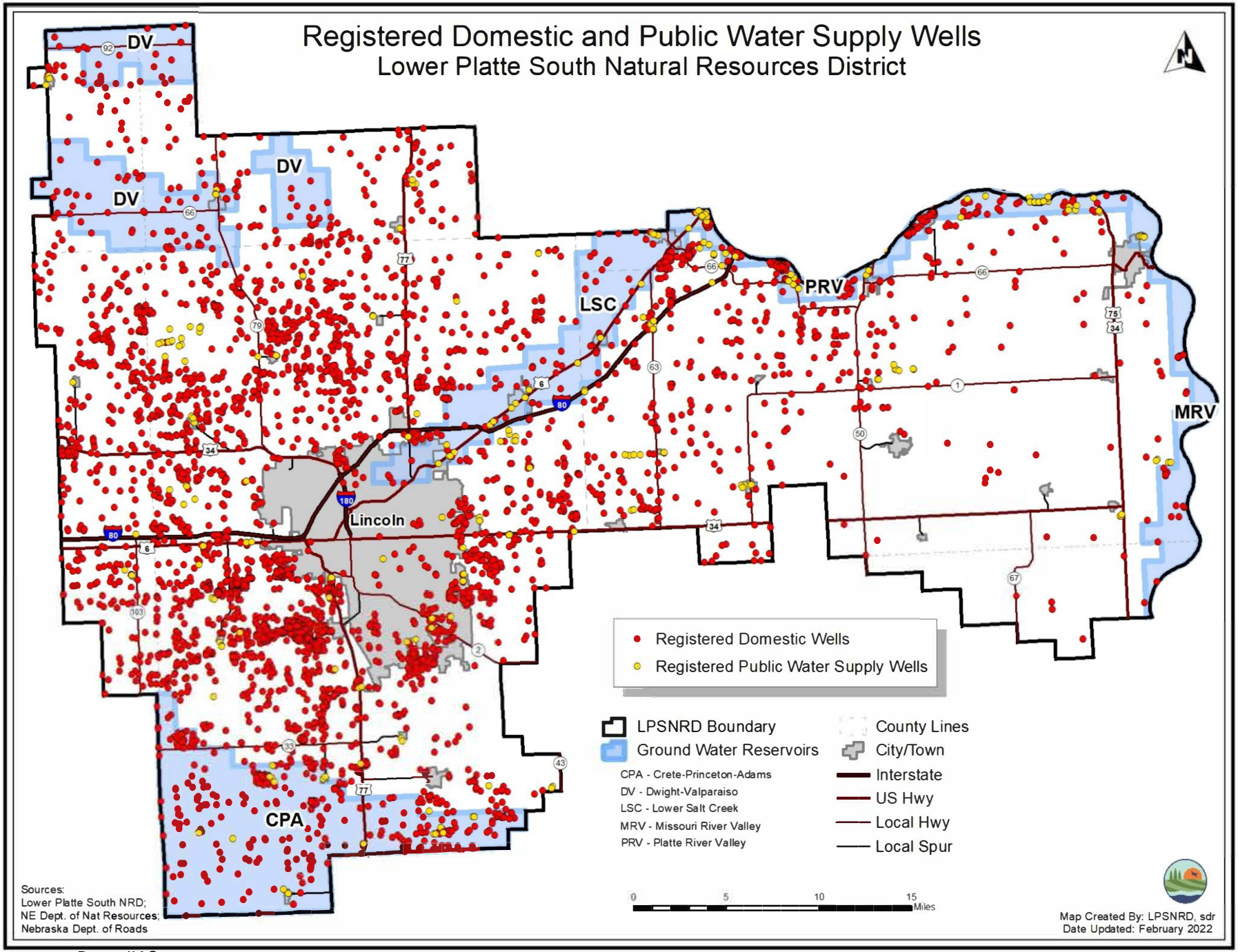
Map Created By: Shaula D. Ross
Updated: March 2008

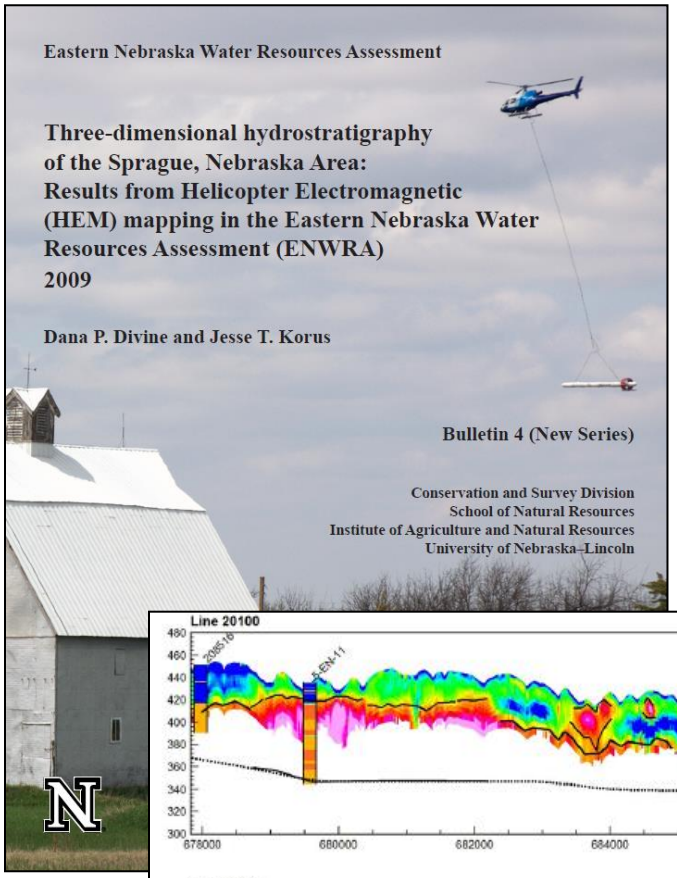

Community Water System Protection Areas
Lower Platte South Natural Resources District
DV
Brainard
Dwight
Valparaiso
Ceresco
Davey
Raymond
Garland
Malcolm
Lancaster Co
SID #6
Lincoln
Pleasant Dale
Denton
Roca
Sprague
Hickman
Panama
CPA
Hallam
Lancaster Co
SID #3
Ashland
Greenwood
LSC
Waverly
Cass Co.
RWD #2
Alvo
Eagle
Elmwood
Cass Co.
SID #5
PRV
Plattsmouth
Louisville
Otoe Co.
RWD #3
Murdock
Murray
Weeping Water
Cass Co.
RWD #1
Cass Co.
SID #1
Union
MRV
LPSNRD Boundary
CWSPAs
Ground Water Reservoirs
CPA - Crete-Princeton-Adams
DV - Dwight-Valparaiso
LSC - Lower Salt Creek
MRV - Missouri River Valley
PRV - Platte River Valley
County Lines
City
Towns
Interstate
US Hwy
Local Hwy
Local Spur
Sources:
Lower Platte South NRD;
Nebraska Dept. of Natural Resources;
Nebraska Dept. of Roads
0
5
10
15
Miles
Map Created By: Shaula D. Ross
Date Created: February 2013

LPSNRD Well Permits

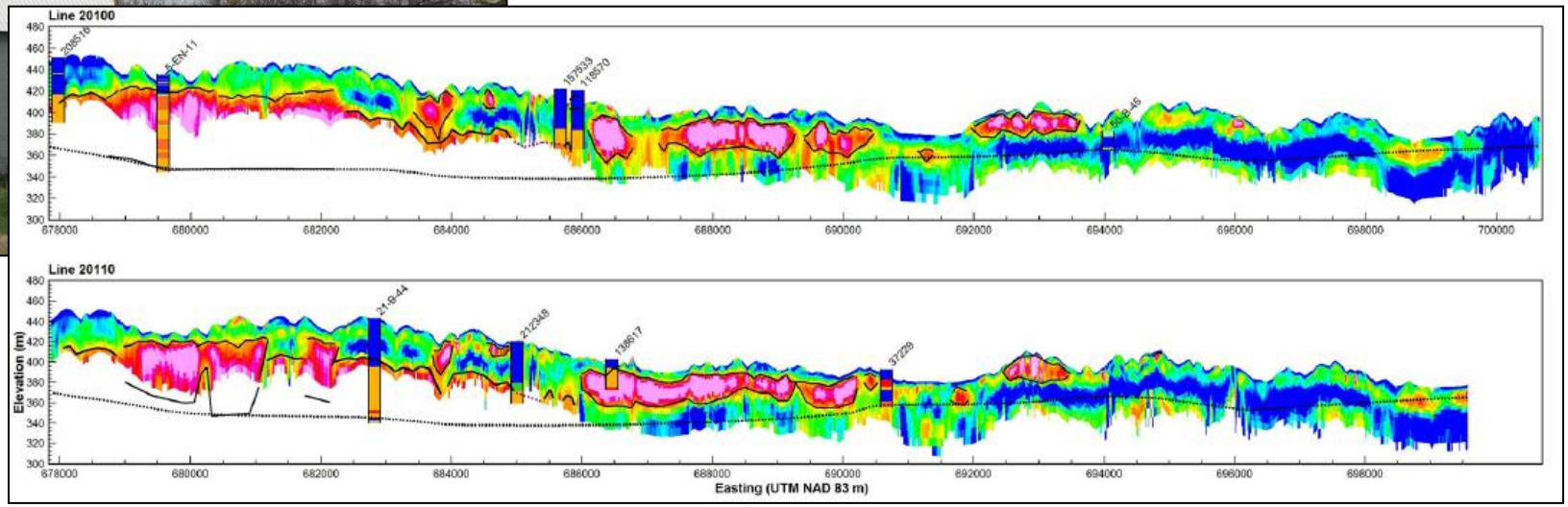
- 4 Different Classes (soon to be 5):
  - Class 1: Located in a GWR; pumping >50 gpm but <1,000 gpm
  - Class 2: Located in a GWR; pumping >1,000 gpm
  - Class 3: Located in RA; pumping <250 gpm & <25 AF
  - Class 4: Located in RA; pumping >250 gpm & > 25 AF
    - All classes of wells require water quality sampling for sodium, chloride, and TDS due to salt water concerns
    - Class 2 and 4 permits require aquifer testing & hydrogeologic analysis to evaluate ground water supply & possible effects on pre-existing wells
  - Class 5: Located anywhere in LPSNRD; pumping >500 AF/year (effective 3/1/2023)
    - Additional requirements


Registered Irrigation Wells
Lower Platte South Natural Resources District
DV
DV
DV
LSC
PRV
MRV
CPA
Lincoln
Registered Irrigation Wells
Active
Inactive
LPSNRD Boundary
Ground Water Reservoirs
CPA - Crete-Princeton-Adams
DV - Dwight-Valparaiso
LSC - Lower Salt Creek
MRV - Missouri River Valley
PRV - Platte River Valley
County Lines
City/Town
Interstate
US Hwy
Local Hwy
Local Spur
0
5
10
15
Miles
Sources:
Lower Platte South NRD;
NE Dept. of Nat Resources;
Nebraska Dept. of Roads
Map Created By: LPSNRD,sdr
Date Updated: February 2022

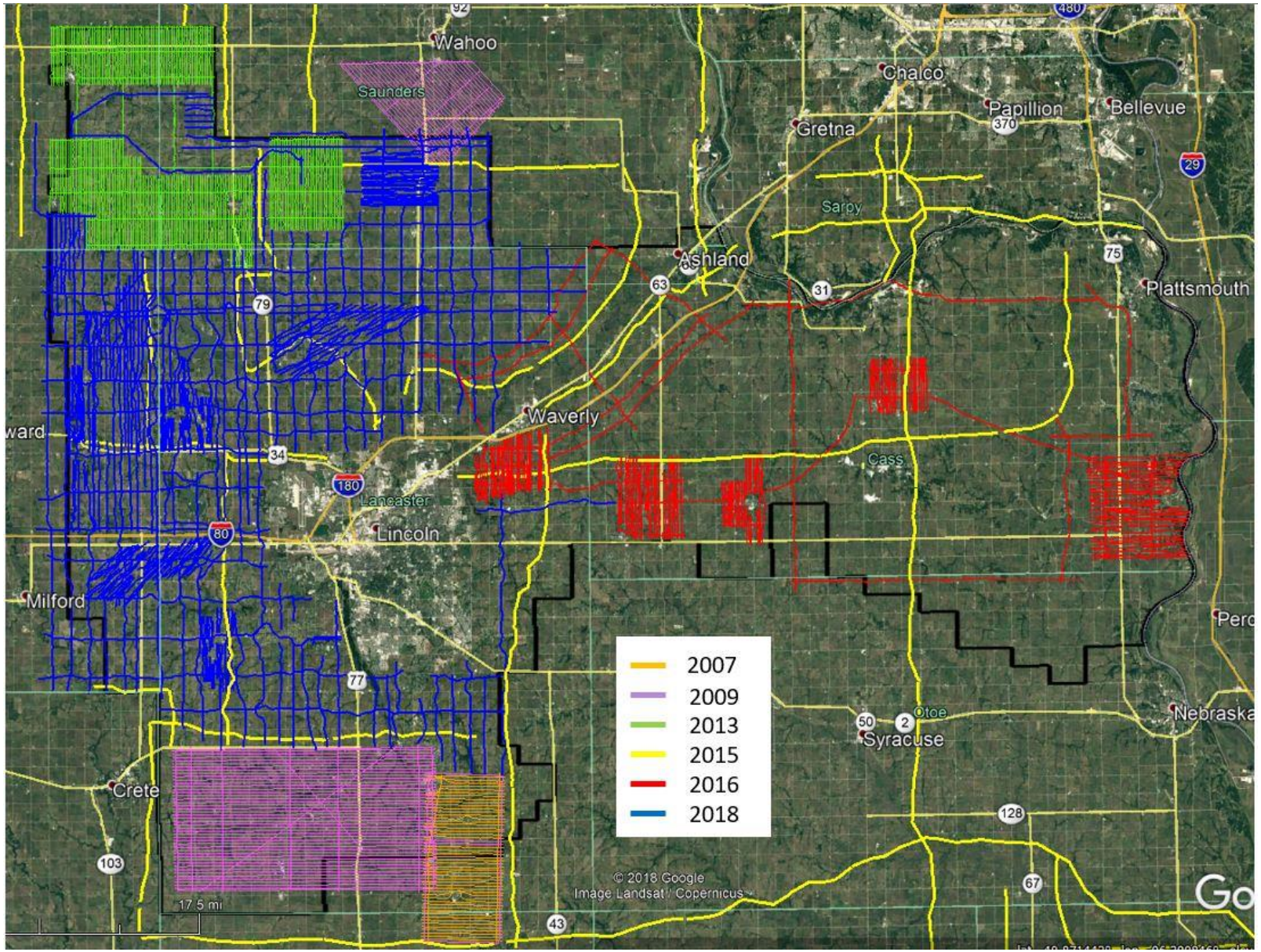

Registered Domestic and Public Water Supply Wells
Lower Platte South Natural Resources District
DV
DV
DV
LSC
PRV
MRV
Lincoln
CPA
Registered Domestic Wells
Registered Public Water Supply Wells
LPSNRD Boundary
Ground Water Reservoirs
CPA - Crete-Princeton-Adams
DV - Dwight-Valparaiso
LSC - Lower Salt Creek
MRV - Missouri River Valley
PRV - Platte River Valley
County Lines
City/Town
Interstate
US Hwy
Local Hwy
Local Spur
0
5
10
15
Miles
Sources:
Lower Platte South NRD;
NE Dept. of Nat Resources;
Nebraska Dept. of Roads
Map Created By: LPSNRD, sdr
Date Updated: February 2022


Eastern Nebraska Water Resources Assessment
Three-dimensional hydrostratigraphy of the Sprague, Nebraska Area: Results from Helicopter Electromagnetic (HEM) mapping in the Eastern Nebraska Water Resources Assessment (ENWRA) 2009
Dana P. Divine and Jesse T. Korus
Bulletin 4 (New Series)
Conservation and Survey Division
School of Natural Resources
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln

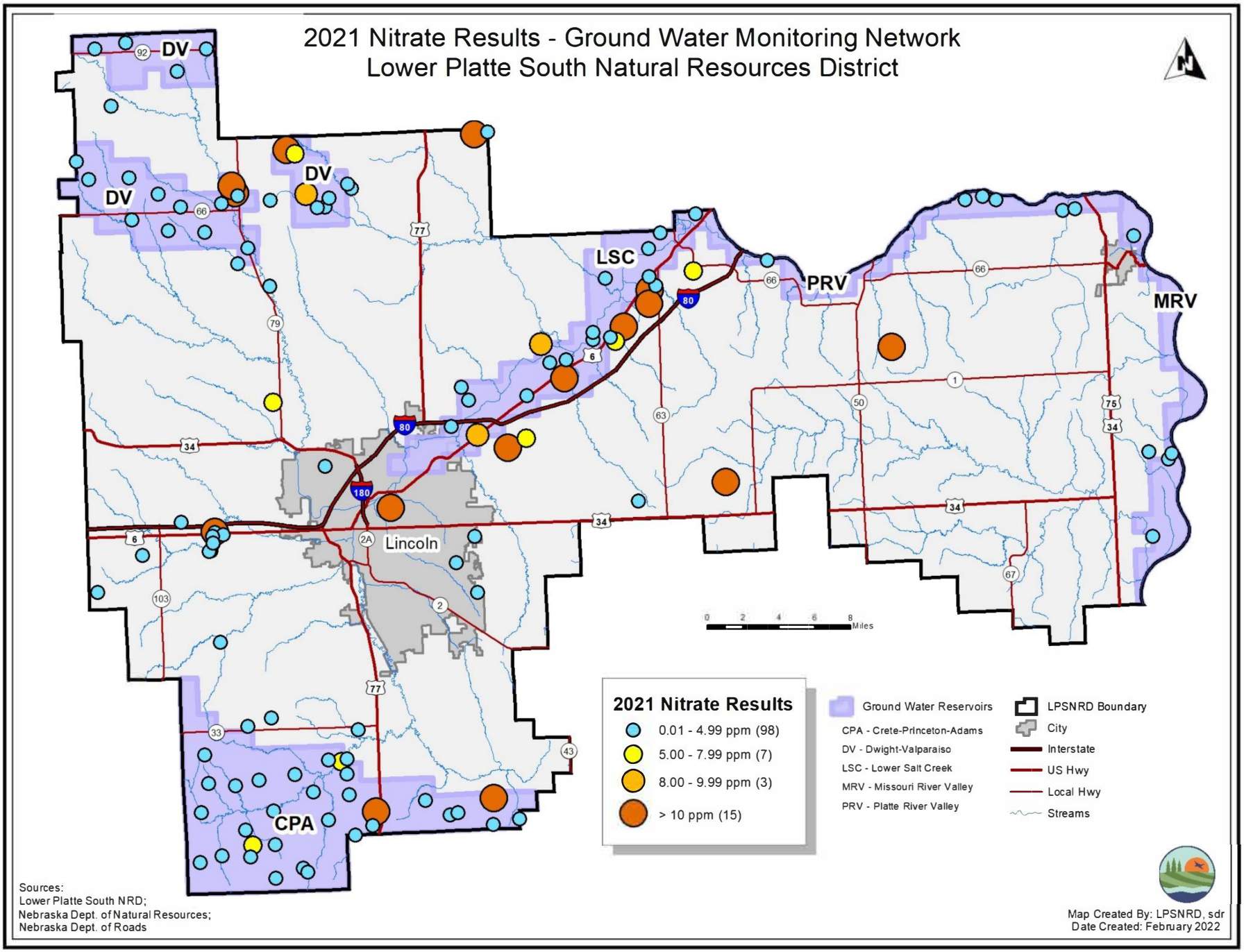
COMPLEXITY!!!!

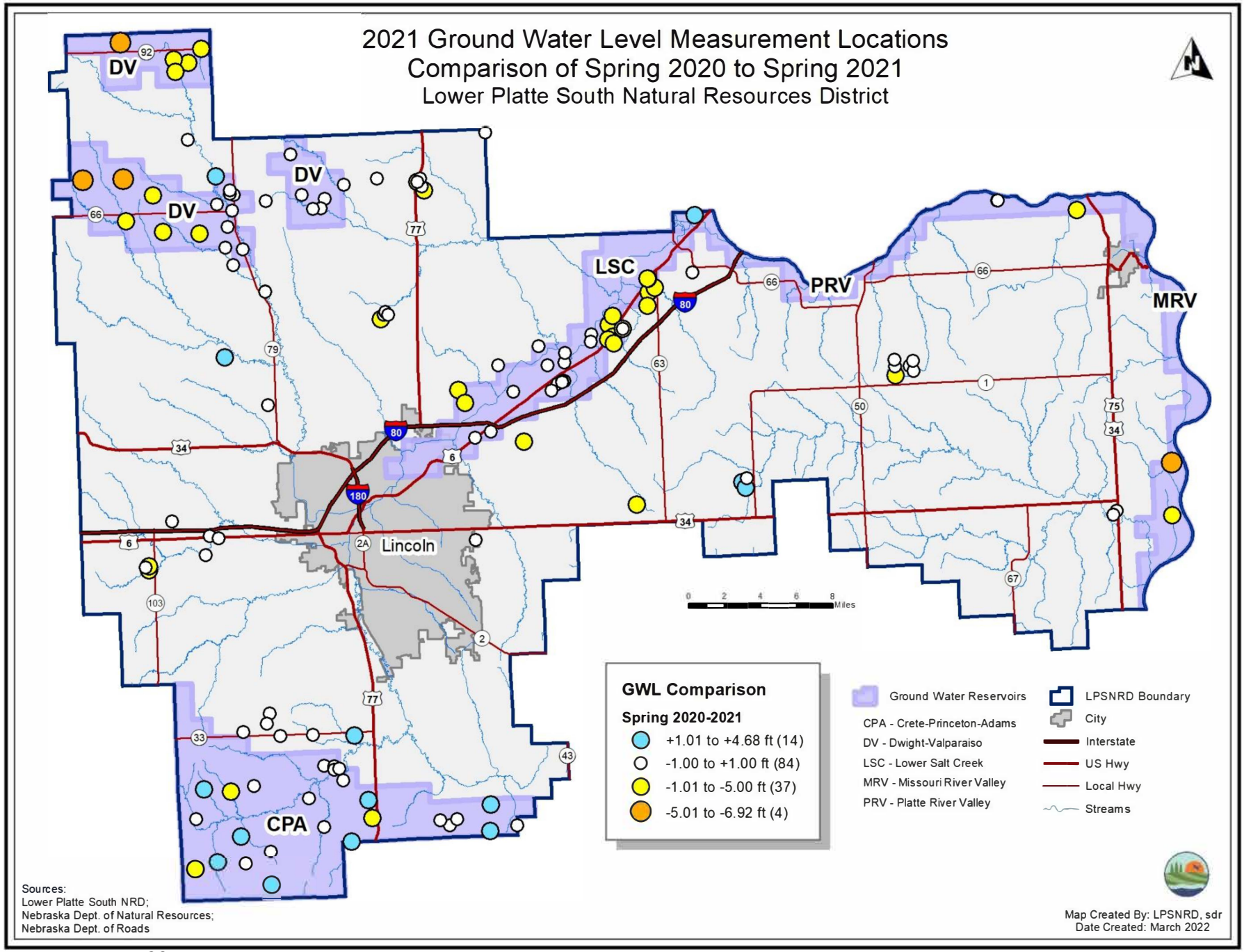

Line 20100
Line 20110
Elevation (m)
Easting (UTM NAD 83 m)

AEM Data Collection

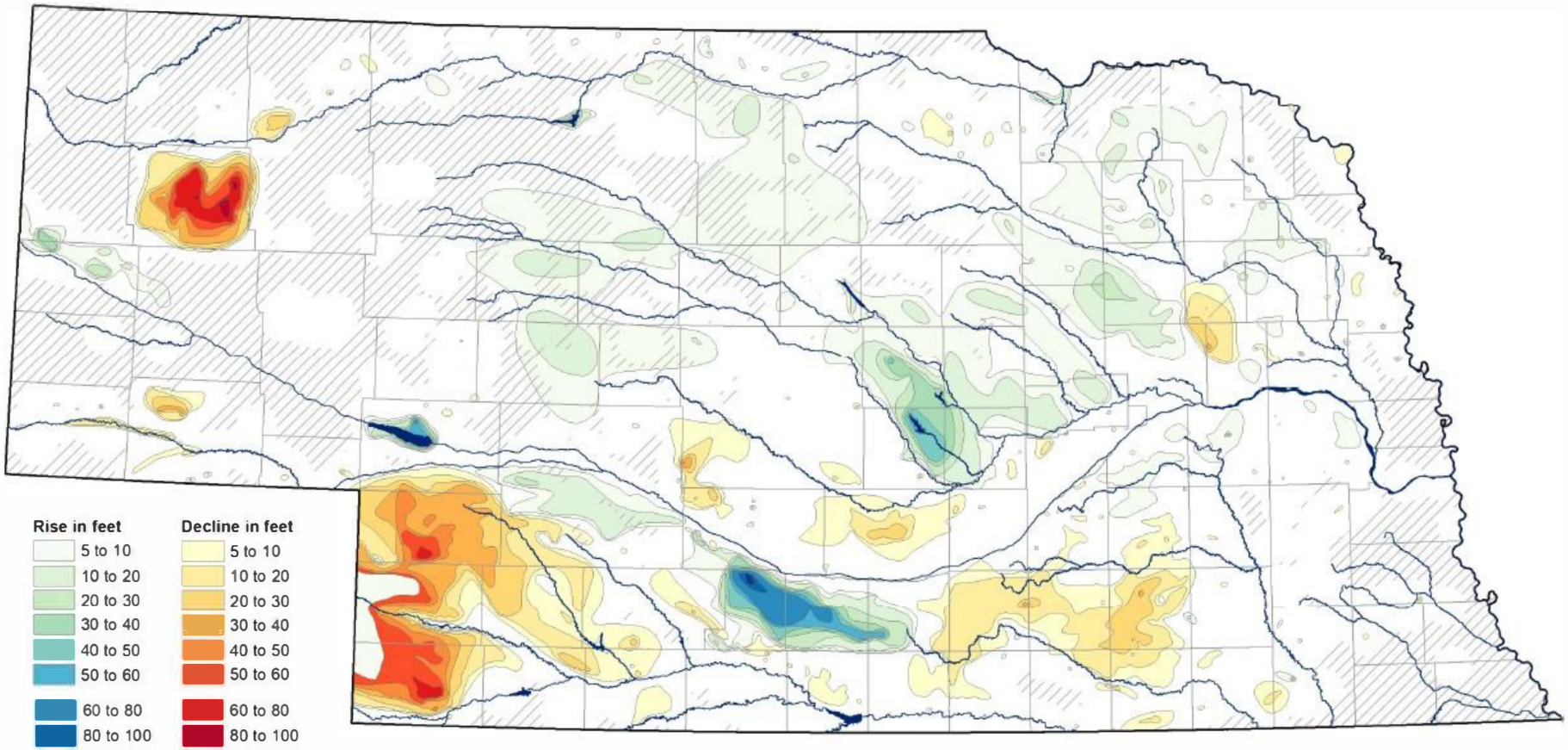


4,300 line miles of AEM data collected in LPSNRD


2021 Nitrate Results - Ground Water Monitoring Network
Lower Platte South Natural Resources District
DV
DV
DV
LSC
PRV
MRV
CPA
Lincoln
0 2 4 6 8 Miles
2021 Nitrate Results
0.01 - 4.99 ppm (98)
5.00 - 7.99 ppm (7)
8.00 - 9.99 ppm (3)
> 10 ppm (15)
Ground Water Reservoirs
CPA - Crete-Princeton-Adams
DV - Dwight-Valparaiso
LSC - Lower Salt Creek
MRV - Missouri River Valley
PRV - Platte River Valley
LPSNRD Boundary
City
Interstate
US Hwy
Local Hwy
Streams
Sources:
Lower Platte South NRD;
Nebraska Dept. of Natural Resources;
Nebraska Dept. of Roads
Map Created By: LPSNRD, sdr
Date Created: February 2022


2021 Ground Water Level Measurement Locations
Comparison of Spring 2020 to Spring 2021
Lower Platte South Natural Resources District
DV
DV
DV
LSC
PRV
MRV
CPA
Lincoln
0 2 4 6 8 Miles
GWL Comparison
Spring 2020-2021
+1.01 to +4.68 ft (14)
-1.00 to +1.00 ft (84)
-1.01 to -5.00 ft (37)
-5.01 to -6.92 ft (4)
Ground Water Reservoirs
CPA - Crete-Princeton-Adams
DV - Dwight-Valparaiso
LSC - Lower Salt Creek
MRV - Missouri River Valley
PRV - Platte River Valley
LPSNRD Boundary
City
Interstate
US Hwy
Local Hwy
Streams
Sources:
Lower Platte South NRD;
Nebraska Dept. of Natural Resources;
Nebraska Dept. of Roads
Map Created By: LPSNRD, sdr
Date Created: March 2022

Groundwater-Level Changes in Nebraska - Predevelopment to Spring 2021



(1 foot = .3048 meters)

For an explanation of information presented on this map, see the 2021 Nebraska Statewide Groundwater-Level Monitoring Report, available for download at ***go.unl.edu/groundwater***

CONSERVATION AND SURVEY DIVISION (http://snr.unl.edu/csd)
School of Natural Resources (http://snr.unl.edu)
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln

Aaron Young, Survey Geologist, CSD
Mark Burbach, Water Levels Program Supervisor, CSD
Les Howard, GIS Manager, CSD

Data provided by:

Nebraska Natural Resources Districts

Central Nebraska Public Power and Irrigation District

U.S. Geological Survey
Nebraska Water Science Center

U.S. Bureau of Reclamation
Kansas-Nebraska Area Office

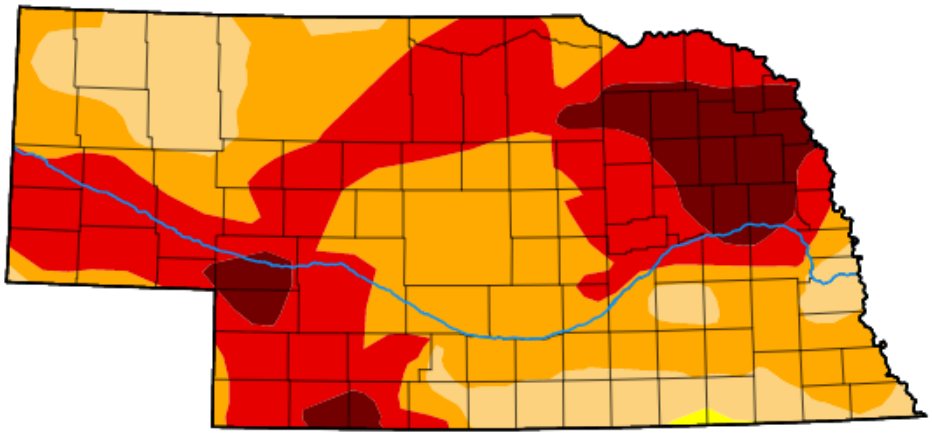
Conservation and Survey Division,
University of Nebraska - Lincoln

February 2022

CONSERVATION AND SURVEY DIVISION
School of Natural Resources

Disclaimer: groundwater-level changes on this map are depicted at a small scale. They are intended to provide only a general overview of regional variation.

Current Conditions



Map released: Thurs. February 2, 2023

Data valid: January 31, 2023 at 7 a.m. EST

Intensity

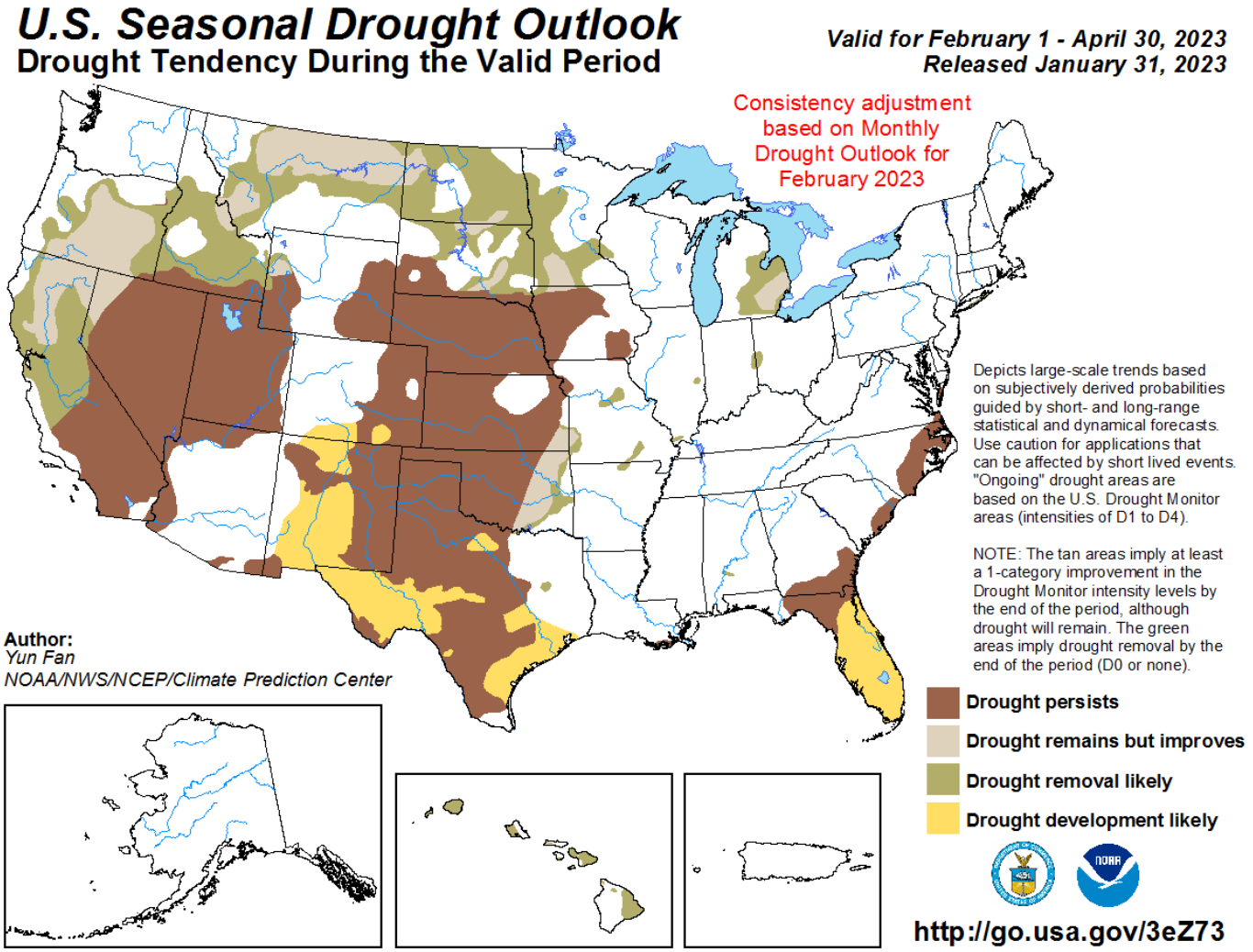
- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

Authors

United States and Puerto Rico Author(s):
Rocky Bilotta, NOAA/NCEI

Pacific Islands and Virgin Islands Author(s):
Brad Rippey, U.S. Department of Agriculture

Seasonal Prediction




QUESTIONS????

DRAFT

WATER WELL PERMIT STUDY ASSISTANCE PROGRAM

Purpose: LPSNRD water well permit rules & regulations may require the applicant to complete a detailed analysis (aquifer test and hydrogeologic analysis) to ensure adequate groundwater is available to meet the purpose of installing the well and to evaluate the likelihood of impacting neighboring wells with the same or higher preference. This analysis also provides the District with information that is beneficial to the District and the District is considering cost-sharing on that expense.

Terms:

1. **The applicant submits the estimated cost to complete an aquifer test and hydrogeologic analysis for the proposed well.**
2. **The District considers agreeing to cost-share with the applicant on 50% of the cost of the aquifer test and hydrogeologic analysis, not to exceed $10,000 of cost to the LPSNRD.**
3. **Applicant completes the aquifer test and hydrogeologic analysis and submits the report to LPSNRD.**
4. **LPSNRD reviews the report and verifies the report is complete and accurate.**
5. **LPSNRD submits the cost-share assistance to the applicant.**