



## LOWER PLATTE SOUTH natural resources district

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### Memorandum

**Date:** March 17, 2021  
**To:** Each Director  
**From:** Paul D. Zillig, General Manager *Paul*  
**RE:** Water Resources Subcommittee Meeting Minutes.

The Water Resources Subcommittee met via video/teleconference at 5:30 p.m. on Monday, March 15, 2021. Subcommittee members participating included Larry Ruth, Chelsea Johnson, John Yoakum, Vern Barrett, Ken Vogel, and Gary Hellerich. Other Directors participating included Deborah Eagan and Bob Andersen. And others participating included Amy Ostermeyer and Dan Levy of Monolith, Brian Dunnigan, Jim Schneider and Jeff McPeak of Olsson, Mi Almaamariya, Corey Wasserburger, Steve Seglin, David Potter, Tracy Zayac, Chris Witthuhn, Maclane Scott, Dick Ehrman, Jared Nelson, and myself.

Chair Ruth opened the meeting and turned it over to Dick Ehrman to present the 2020 Groundwater Management Plan Annual Review. Ehrman reviewed with the Subcommittee the activities and accomplishments in implementing our Groundwater Management Plan, including groundwater quality monitoring for nitrates, pesticides, and arsenic; vadose zone sampling; review of triggers for both quality and quantity; groundwater quantity (water levels); Dwight-Val-Brainard Special Management Area; certified irrigated acres; well permitting; well decommissioning; chemigation permitting; water meter reports; soil sampling; fertilizer meters; Spring Nitrogen Assistance Program (SNAP); ENWRA assistance; and public information & education. Ehrman reviewed the attached powerpoint and answered questions. A report will be presented at the Board Meeting.

The next item on the agenda was a discussion on the update of the Monolith Well Permit application and schedule. Amy Ostermeyer reviewed the requirements of the application and their efforts to update the application. Ostermeyer also reported on the meetings and information provided to the NRD. Ostermeyer reported that they are in the process of completing test holes for two additional wells for Olive Creek 2. Wet conditions have delayed this work but they hope to have everything available for the application in a couple of weeks. The Subcommittee asked numerous questions on Monolith's efforts to work with neighboring well owners and also discussed the proposed well protection agreements. Monolith expressed their interest in working with their neighbors and felt

the agreements are a sign of their interest in working with neighbors, should well problems ever arise. Ostermeyer also expressed their interest in establishing a good monitoring well plan that would identify any potential problems.

I reported that we are at the point that the Board needs to determine and approve any additional information that needs to be included in the application. As an example we have several recommendations from LRE Water and will consider any staff recommendations and Director's requests to include additional information. The Board will need to approve this list at a Special Board Meeting just recently approved by Chair Eagan for Wednesday, March 24 @5:30pm. Directors are encouraged to submit any additional information that they feel needs to be included in the application for Board consideration. I reviewed the proposed schedule to consider the Monolith well permit application:

March 24 @ 5:30pm - Special Board Meeting (Board approval of additional info)  
April 8 @ 5:30pm – Virtual Public Input Meeting.  
April 12, 13, or 14 @5:30pm – Water Resources Subcommittee Meeting.  
April 21 @ 7:00pm – Board Meeting to consider Monolith well permit application.

There being no additional business the meeting adjourned at 7:42 pm.

PDZ/pz

cc: Steve Seglin & Corey Wasserburger

Ground Water

# Lower Platte South NRD Groundwater Management Plan 2020 Annual Review

**Water Resources Subcommittee Meeting  
March 15, 2021**

# 2020 Highlights

- Completed annual groundwater network sampling and level measurements
- Nitrate levels in several designated management areas steady or in slight decline (LSC GWR, Hickman, Union, Valparaiso)
- No new exceedances of Phase II/III triggers
  - Emerald, Greenwood (Phase II), & Pleasant Dale (Phase III) studies completed in 2020
  - Ashland & Raymond (Phase II) studies initiated in 2020
- Received 10<sup>th</sup> annual reports of water usage from 324 metered wells; calculated water usage for these wells pumping a total of about 3.6 billion gallons (compare with 2.5 billion gallons for 2019); 56% of total used for irrigation (6,235 acre-feet)
- Groundwater levels increased in 74 measured wells and decreased in 60 wells but most changes were small; District-wide average increase of 0.09'
- Issued 9 new well permits (compare with 7 in 2019); considerable effort put into processing Monolith permit
- Continued development of voluntary Integrated Management Plan & participation in Lower Platte River Basin Coalition

# 2020 Groundwater Quality Results



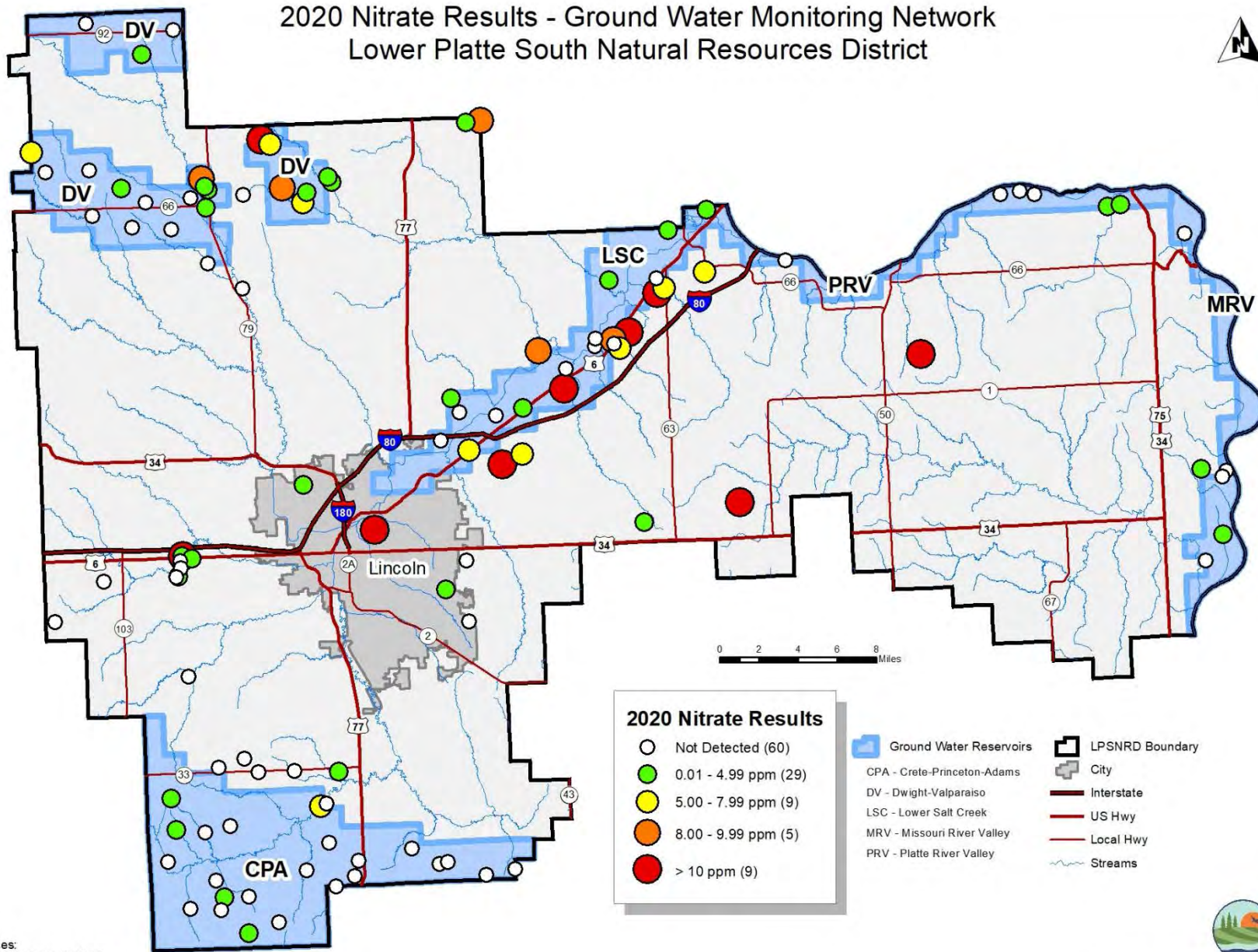
# 2020 Groundwater Quality Monitoring Summary

256 samples, 48 QA/QC samples from 235  
different wells

## Parameters:

- Nitrate-N
- Major Ions (rotated between GWRs—Lower Salt Creek GWR in 2020)
- Pesticides (rotated between GWRs—Lower Salt Creek GWR & community wells in 2020)
- Arsenic (community wells & CWSPA wells)

# 2020 Nitrate Results - Ground Water Monitoring Network Lower Platte South Natural Resources District



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



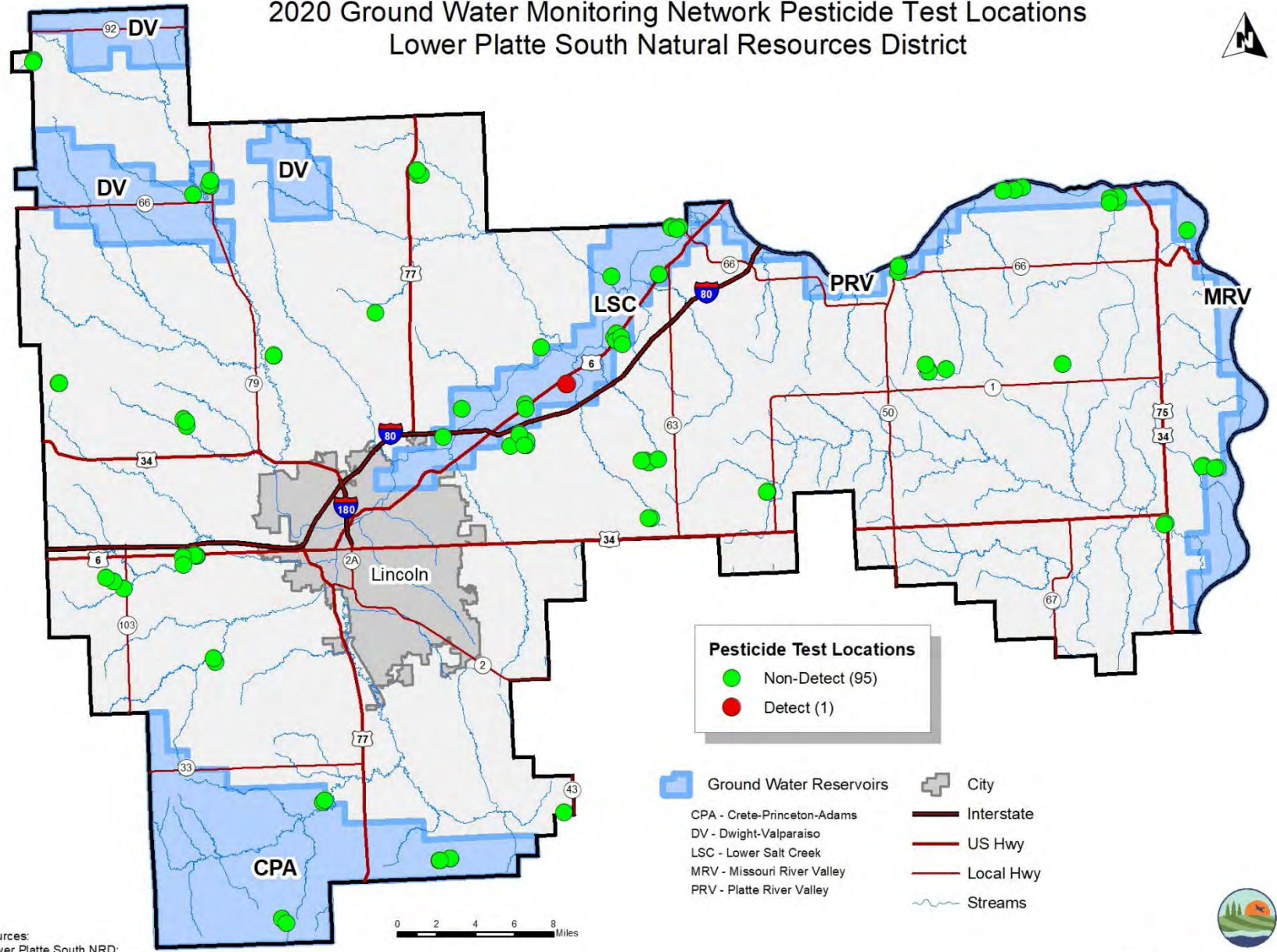
# 2020 Nitrates by GWR vs. Triggers

Groundwater Reservoir	# Network Wells Sampled	Network Samples $\geq 50\%$ of MCL*	Network Samples $\geq 80\%$ of MCL*
Crete-Princeton-Adams	16	5%	0%
Dwight-Valparaiso	20	25%	10%
Lower Salt Creek	16	<b>25% (Phase II Area)</b>	10%
Missouri River Valley	6	0%	0%
Platte River Valley	7	0%	0%
Remaining Area	40	32%	25%

\* Phase II Trigger: 50% of network wells  $\geq 50\%$  of MCL (5 ppm)  
 Phase III Trigger: 80% of network wells  $\geq 80\%$  of MCL (8 ppm)



# 2020 Ground Water Monitoring Network Pesticide Test Locations Lower Platte South Natural Resources District

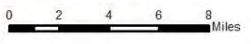


**Pesticide Test Locations**

- Non-Detect (95)
- Detect (1)

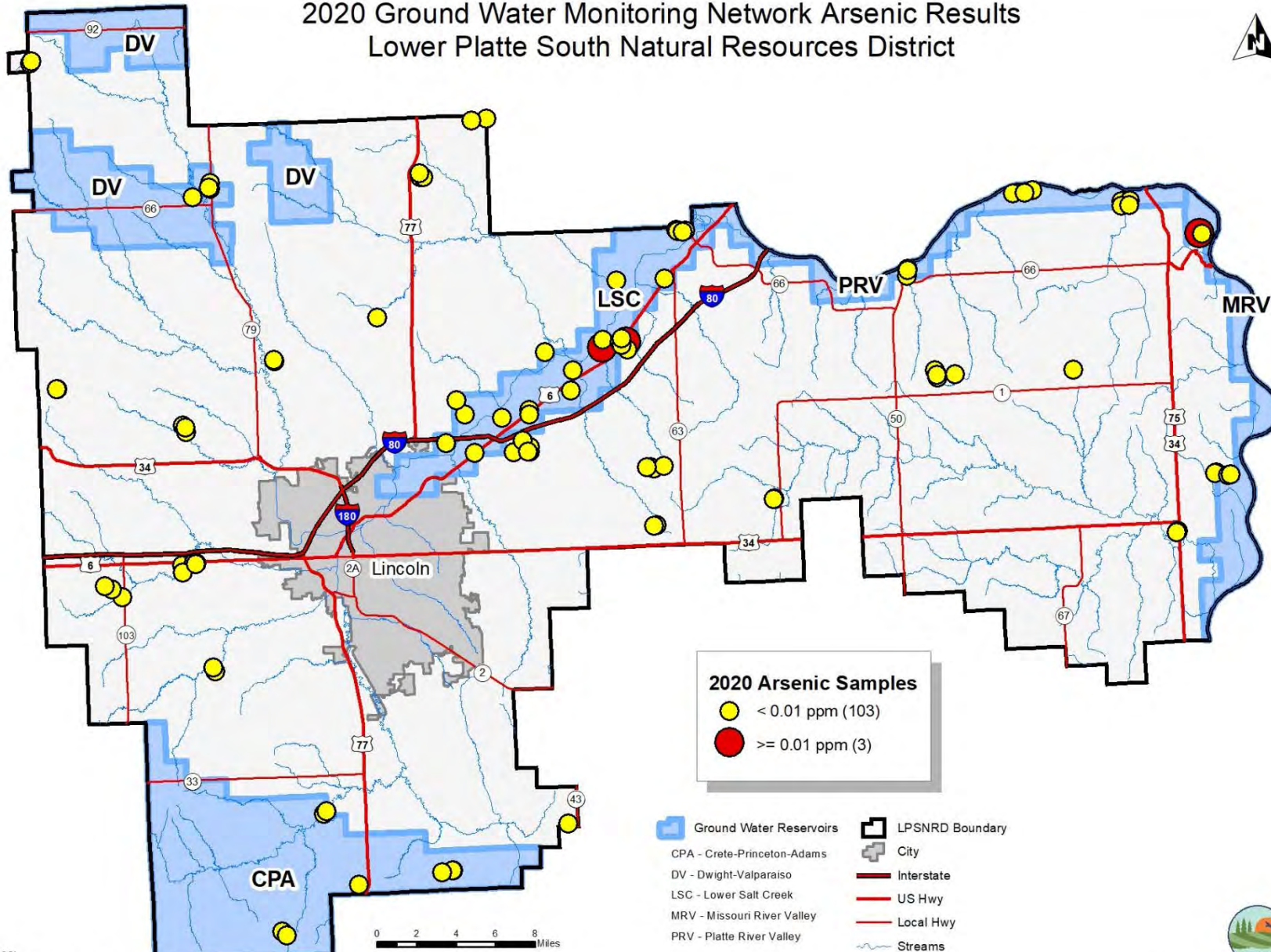
Ground Water Reservoirs	City
CPA - Crete-Princeton-Adams	Interstate
DV - Dwight-Valparaiso	US Hwy
LSC - Lower Salt Creek	Local Hwy
MRV - Missouri River Valley	Streams
PRV - Platte River Valley	

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



Map Created By: LPSNRD, sdr  
Date Created: February 2021

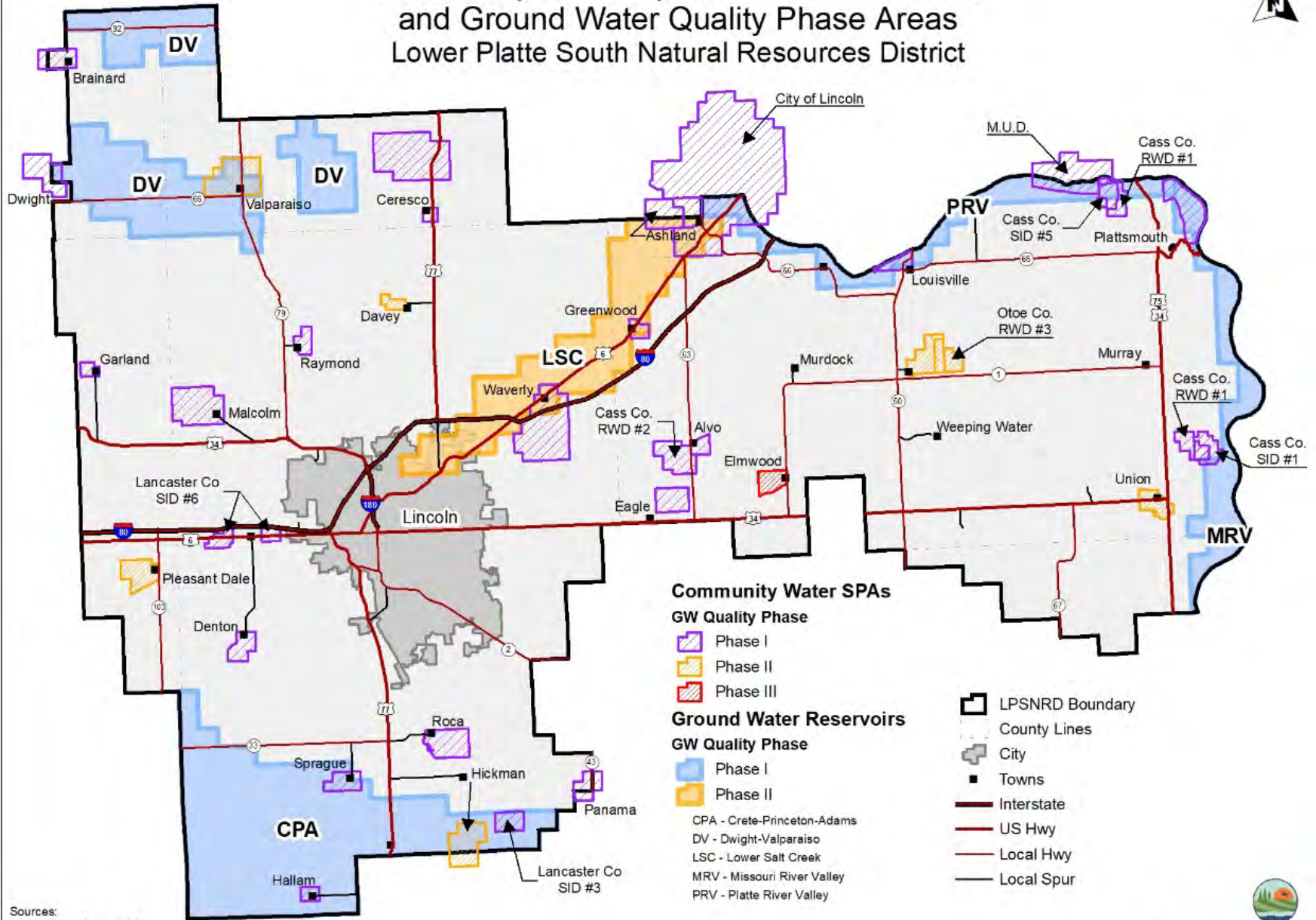
# 2020 Ground Water Monitoring Network Arsenic Results Lower Platte South Natural Resources District



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



# Community Water System Protection Areas and Ground Water Quality Phase Areas Lower Platte South Natural Resources District

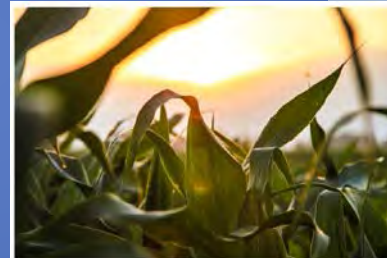


Sources:  
 Lower Platte South NRD;  
 Nebraska Dept. of Natural Resources;  
 Nebraska Dept. of Roads



# Vadose Zone Program

- Working w/ UNL-WSL on project for advanced methods, SOP development, database
- UNL fieldwork curtailed in 2020 due to COVID pandemic



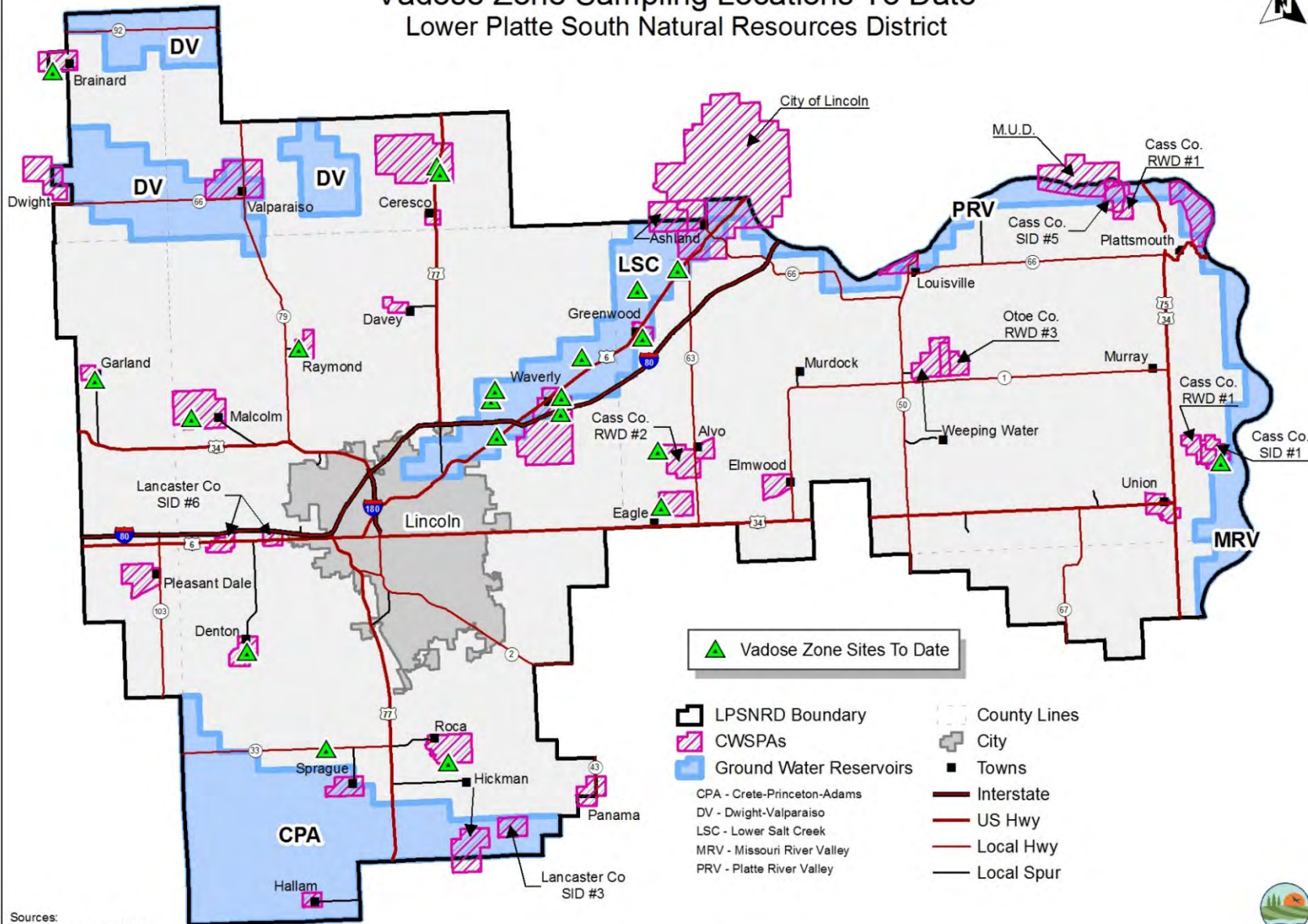
**Vadose Zone Sampling Project Technical Report**  
Lower Platte South Natural Resources District  
September 2018 (Final)

By Daniel Snow, Ph.D., University of Nebraska-Lincoln Water Resources Laboratory



# Vadose Zone Sampling Locations To Date

## Lower Platte South Natural Resources District



Vadose Zone Sites To Date

- LPSNRD Boundary
  - CWSPAs
  - Ground Water Reservoirs
  - County Lines
  - City
  - Towns
  - Interstate
  - US Hwy
  - Local Hwy
  - Local Spur
- CPA - Crete-Princeton-Adams  
 DV - Dwight-Valparaiso  
 LSC - Lower Salt Creek  
 MRV - Missouri River Valley  
 PRV - Platte River Valley

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



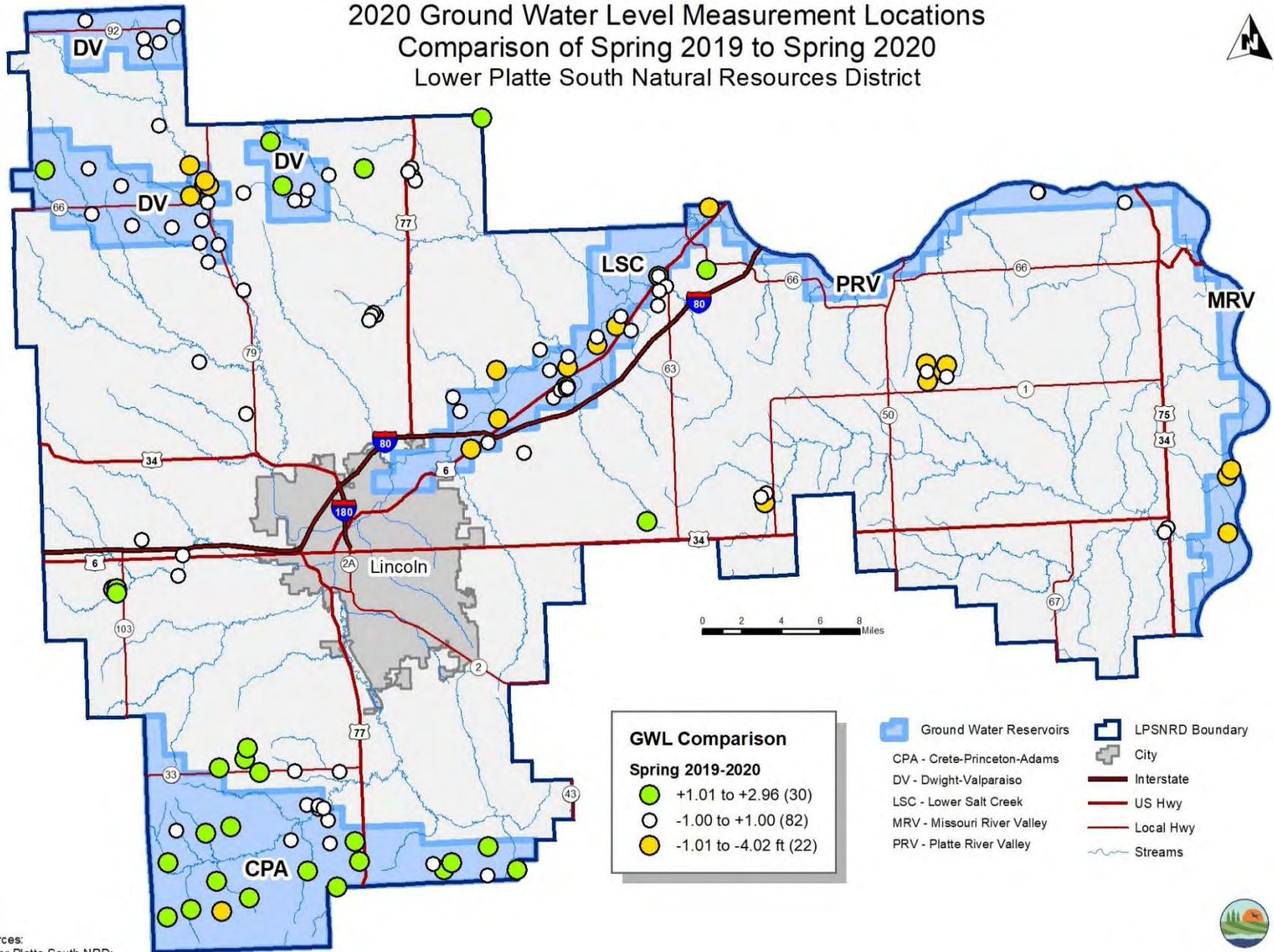
# 2020 Groundwater Quantity Results



# 2020 Groundwater Level Monitoring Summary

- 288 water levels measured
- 142 different wells
- Semiannual measurements:
  - Spring: March-April
  - Fall: October-November
- Spring-spring measurements used for comparison & phase determination as specified in GWMP
- 55% of measured wells showed increase; 45% showed decrease from 2018-2019

# 2020 Ground Water Level Measurement Locations Comparison of Spring 2019 to Spring 2020 Lower Platte South Natural Resources District



### GWL Comparison

#### Spring 2019-2020

- +1.01 to +2.96 (30)
- -1.00 to +1.00 (82)
- -1.01 to -4.02 ft (22)

- 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

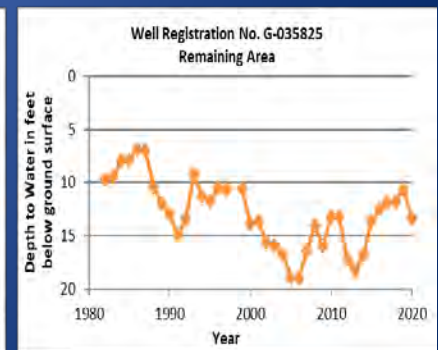
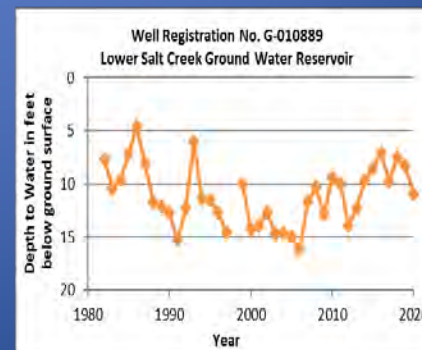
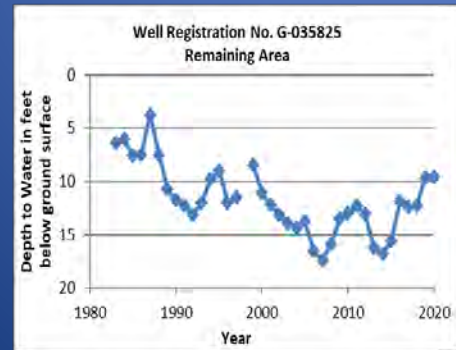
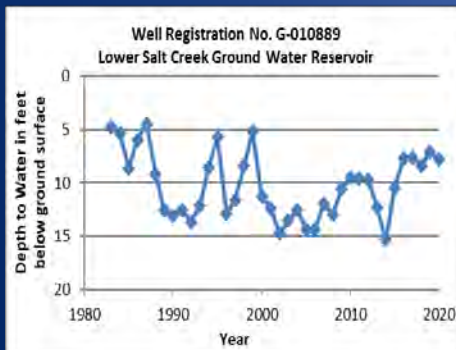
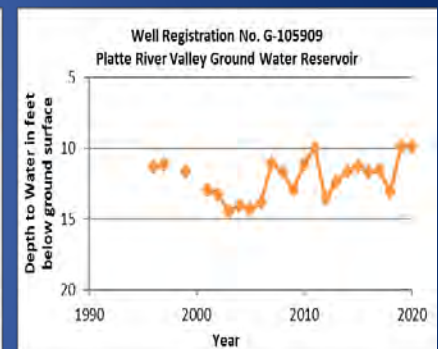
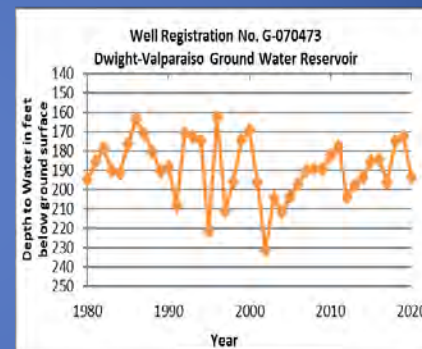
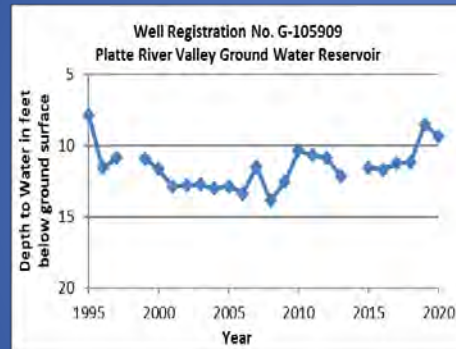
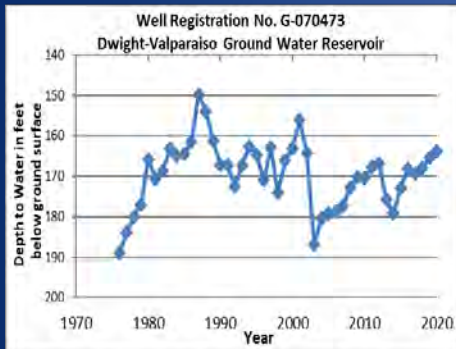
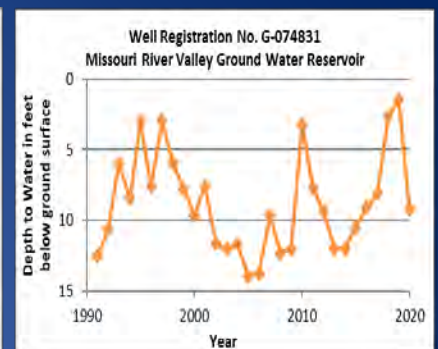
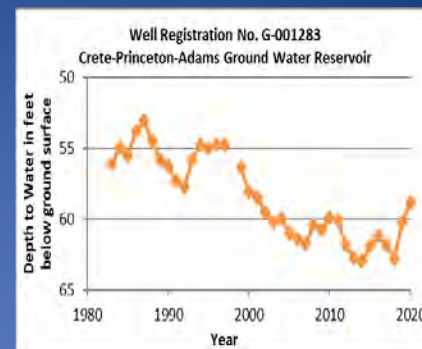
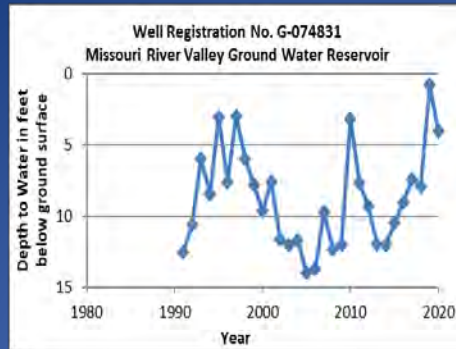
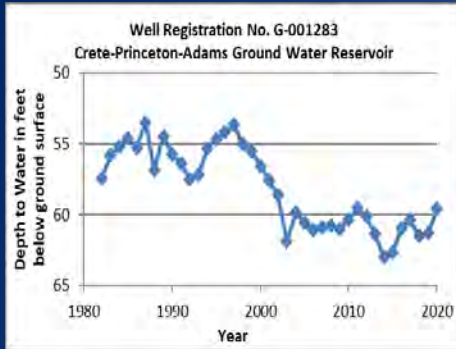
Sources:  
Lower Platte South NRD;  
Nebraska Dept. of Natural Resources;  
Nebraska Dept. of Roads





# SPRING

# FALL



# Quantity Triggers

Groundwater Reservoir	Percentage of wells below Phase II %* reduction in average saturated thickness	Percentage of wells below Phase III%* reduction in average saturated thickness	Average change in Water levels, Spring 2019-2020 (ft.)
Crete-Princeton-Adams	0%	0%	1.09
Dwight-Valparaiso	0%	0%	-0.14
Lower Salt Creek	0%	0%	-0.62
Missouri River Valley	0%	0%	-3.34
Platte River Valley	0%	0%	-1.06
Remaining Area	0%	0%	0.30

\* Phase II: 30% of network wells w/ 8% reduction; LSC is 30% w/ 15%

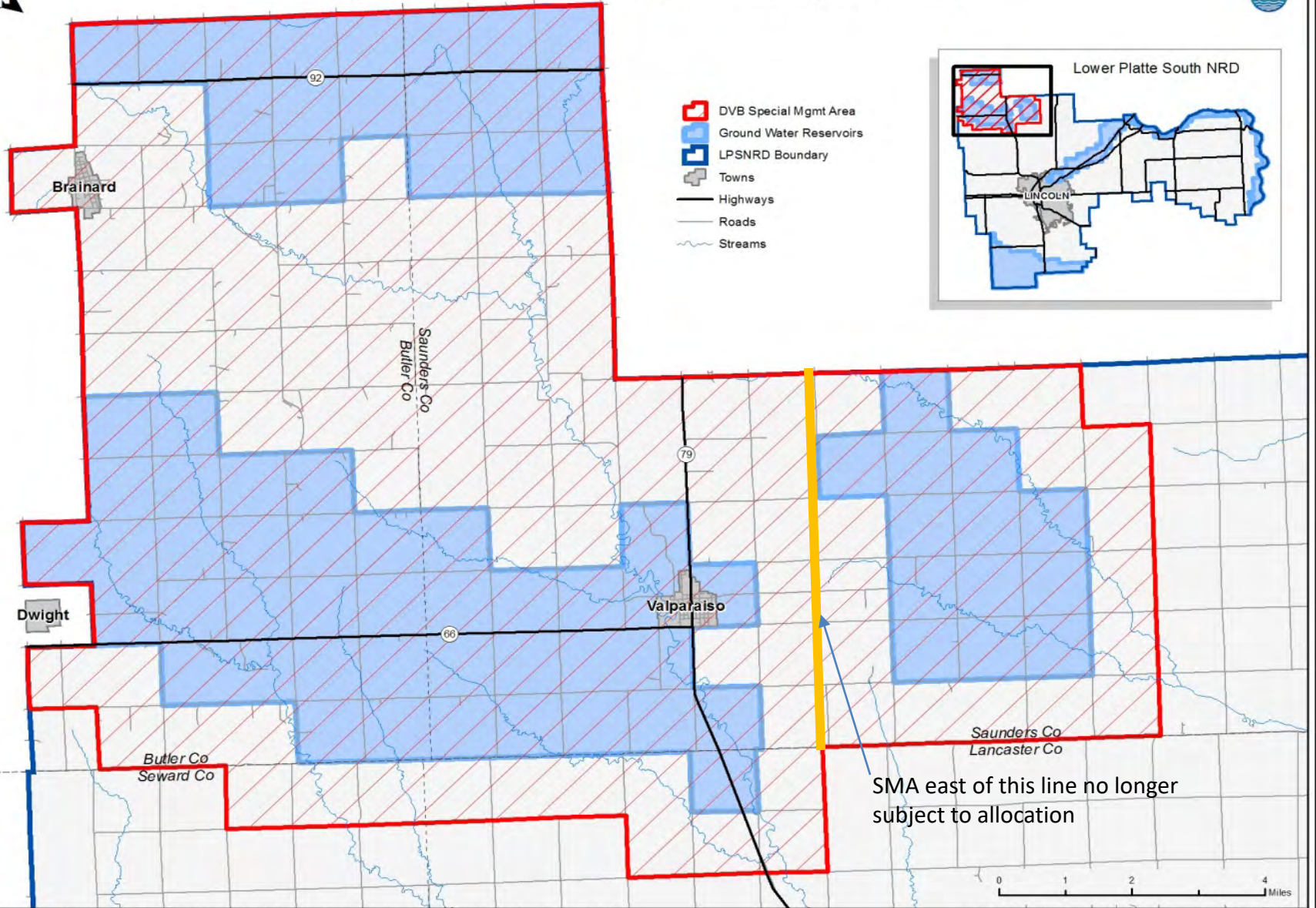
\* Phase III: 50% of network wells w/ 15% reduction; LSC is 50% w/ 30%

# DVB SMA

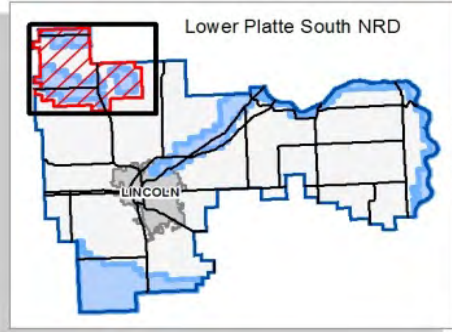
- 2014—SMA designated; rules & regulations adopted
- 2015—First irrigation certification class held (63 operators); recertification class held 2019
- 2020
  - First year of new regulations
    - 3 year “rolling” allocation; 21 acre-inches for 3 years w/ 9 acre-inch maximum in any one year
    - No separate allocation for gravity irrigation
  - One violation of allocation in 2020; irrigator assessed 2X over-use penalty



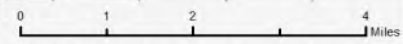
# Dwight-Valparasio-Brainard Special Management Area



- DVB Special Mgmt Area
- Ground Water Reservoirs
- LPSNRD Boundary
- Towns
- Highways
- Roads
- Streams



SMA east of this line no longer subject to allocation



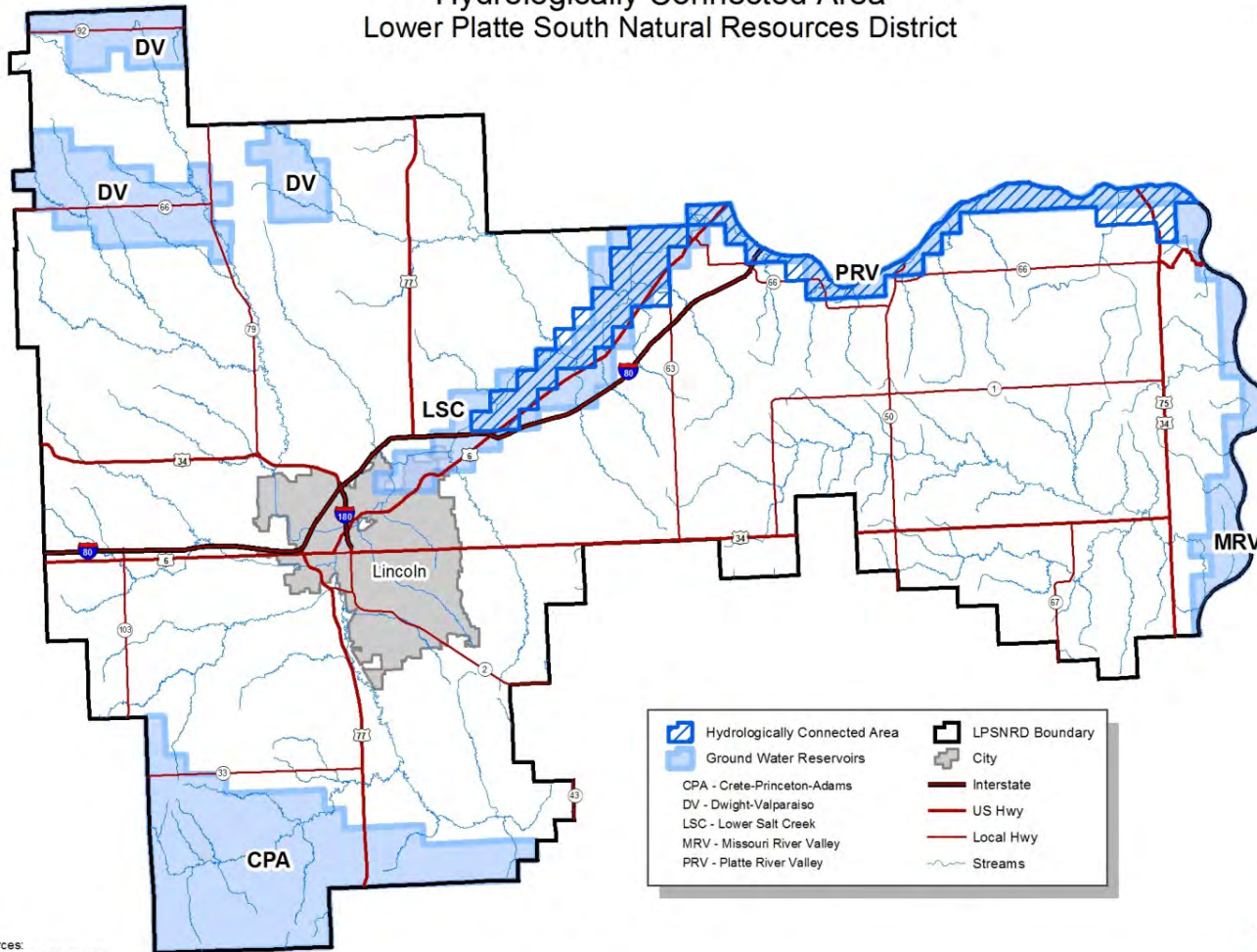
Sources: Lower Platte South NRD; NE Dept of Natural Resources; NE Dept of Environmental Quality; NE Dept of Roads

Map Created By: Shaula D. Ross, LPSNRD - Date: Feb 2015

# Certification of Irrigated Acres

- Documentation of lands irrigated with groundwater & well(s) used to irrigate
- Two areas:
  - Hydrologically Connected Area (HCA)
    - Delineated by NDNR
    - Rules & Regulations pursuant to LB483 adopted 7/2009
    - Deadline for certification: 3/31/2009
    - Document “historically groundwater irrigated acres”—acres irrigated BEFORE 12/16/2008
    - Allow for expansion according to LPRBC
  - Remainder of LPSNRD (Non-HCA)
    - LPSNRD groundwater Rules & Regulations
    - Deadline for certification: 1/30/2011 (Current regs state acres must be certified BEFORE being irrigated)

## Hydrologically Connected Area Lower Platte South Natural Resources District



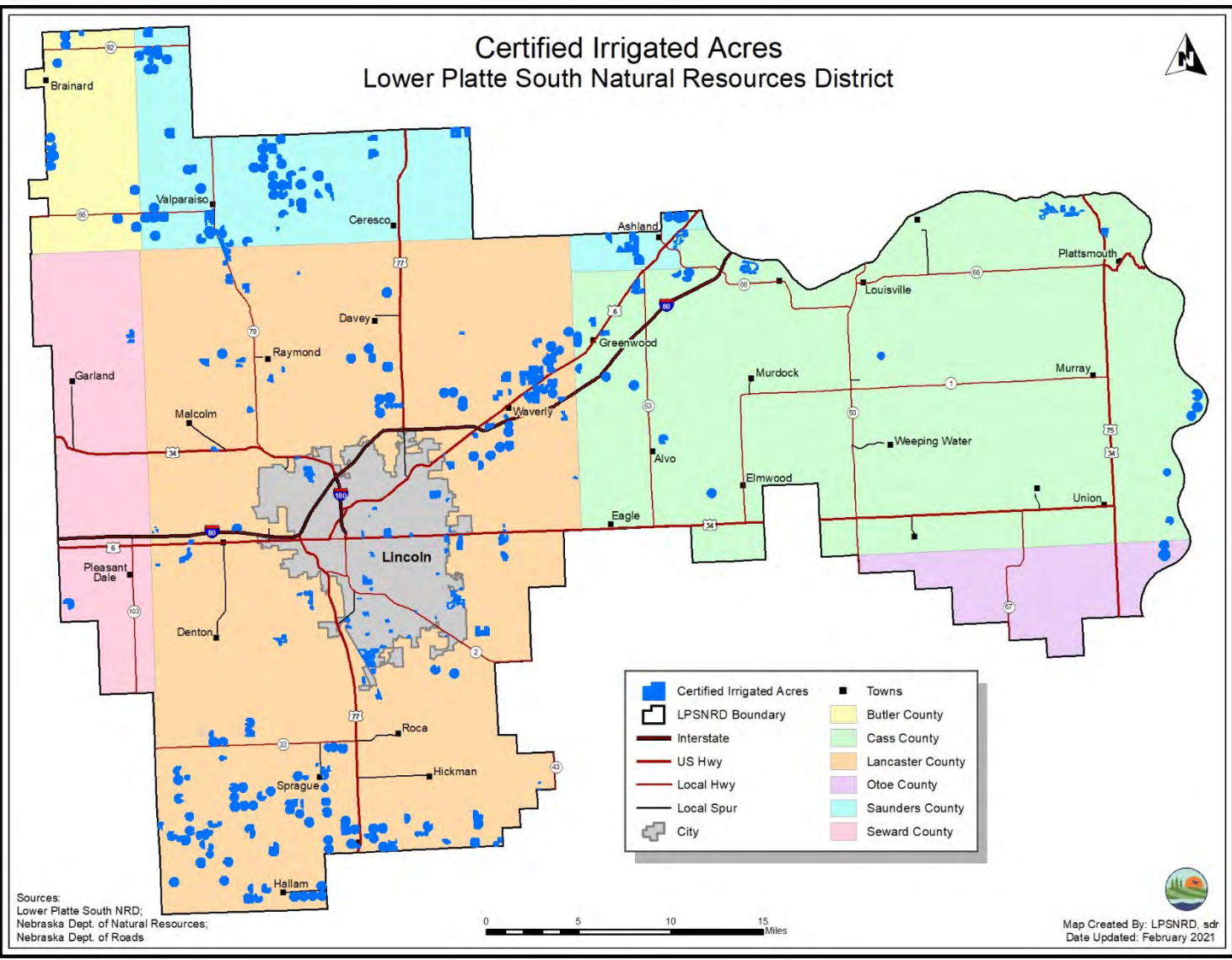
Sources:  
Lower Platte South NRD;  
Nebraska Dept. of Natural Resources;  
Nebraska Dept. of Roads

0 5 10 15  
Miles

Map Created By: Shaula D. Ross  
Date Created: January 2010

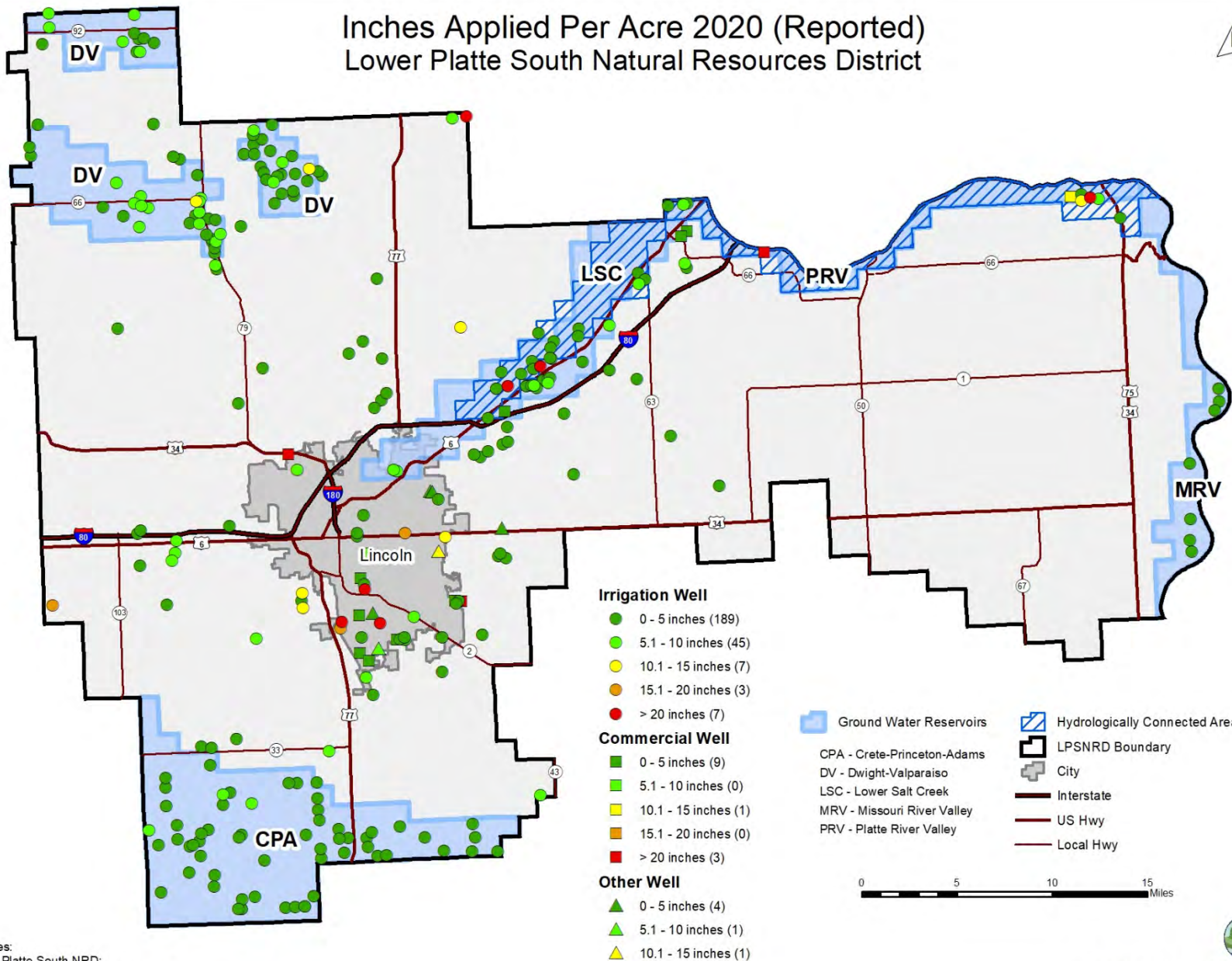
About 65 sq. miles in 77 different sections from Waverly to Ashland along Salt Creek, and from Ashland to Plattsmouth along the Platte River. NDNR has completed modelling for Lower Platte Basin; HCA likely to be modified

# Certified Irrigated Acres Lower Platte South Natural Resources District



**24,575.39 acres certified in non-HCA;**  
**3,268.2 acres certified in HCA**  
**27,843.59 acres certified District-wide**  
**(No new acres in 2020)**

# Inches Applied Per Acre 2020 (Reported) Lower Platte South Natural Resources District



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

Map Created By: LPSNRD, sdr  
Date Created: March 2021

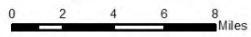
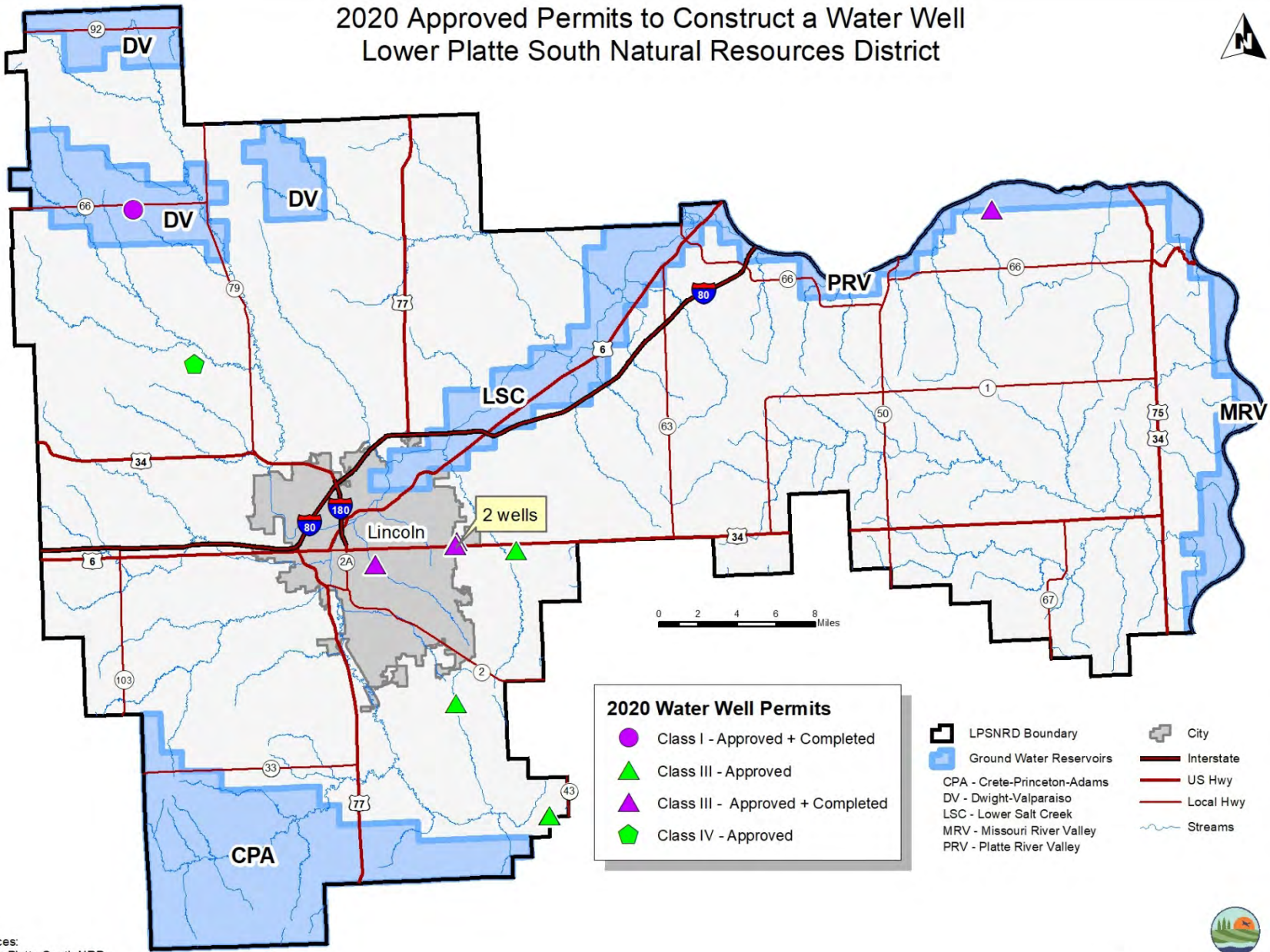


# 2020 Water Well Permits

- Issued 9 well permits
  - 4 irrigation, 2 domestic, 1 commercial, 1 public supply, 1 other
  - 5 of these completed in 2020
- Preliminary permit for Monolith well estimated at 320 M gal/yr issued July 2020; aquifer test & modeling report received December 2020



# 2020 Approved Permits to Construct a Water Well Lower Platte South Natural Resources District



- 2020 Water Well Permits**
- Class I - Approved + Completed
  - ▲ Class III - Approved
  - ▲ Class III - Approved + Completed
  - ⬠ Class IV - Approved

- LPSNRD Boundary
- Ground Water Reservoirs
- CPA - Crete-Princeton-Adams
- DV - Dwight-Valparaiso
- LSC - Lower Salt Creek
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- Streams

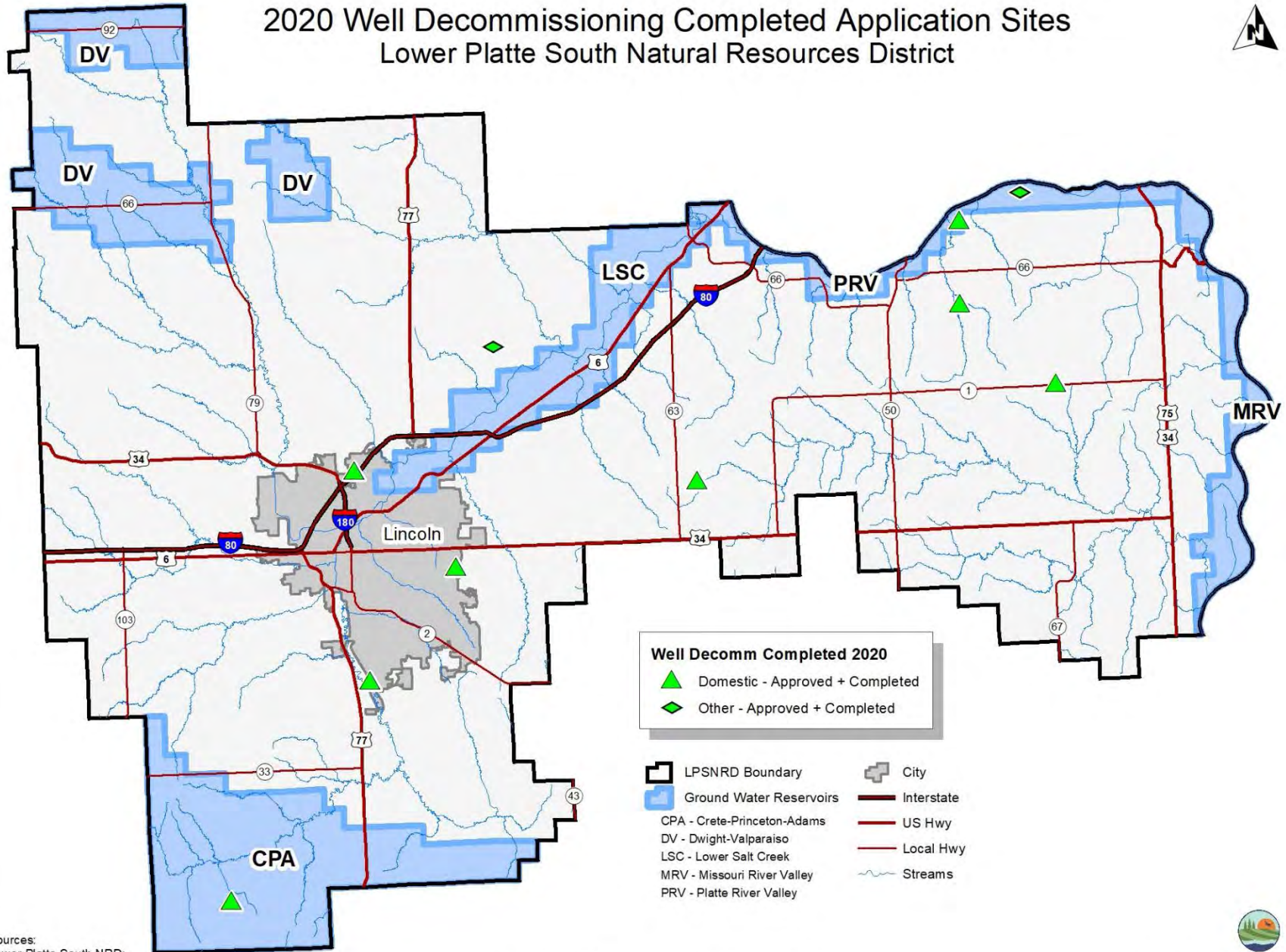
Sources:  
Lower Platte South NRD;  
Nebraska Dept. of Natural Resources;  
Nebraska Dept. of Roads

# 2020 Well Decommissioning Program

- Decommissioned 10 wells
  - 8 domestic
  - 2 other
- As of 12/31/2020, 1,030 wells decommissioned in LPSNRD since 1990!



# 2020 Well Decommissioning Completed Application Sites Lower Platte South Natural Resources District



**Well Decomm Completed 2020**

- ▲ Domestic - Approved + Completed
- ◆ Other - Approved + Completed

LPSNRD Boundary	City
Ground Water Reservoirs	Interstate
CPA - Crete-Princeton-Adams	US Hwy
DV - Dwight-Valparaiso	Local Hwy
LSC - Lower Salt Creek	Streams
MRV - Missouri River Valley	
PRV - Platte River Valley	

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

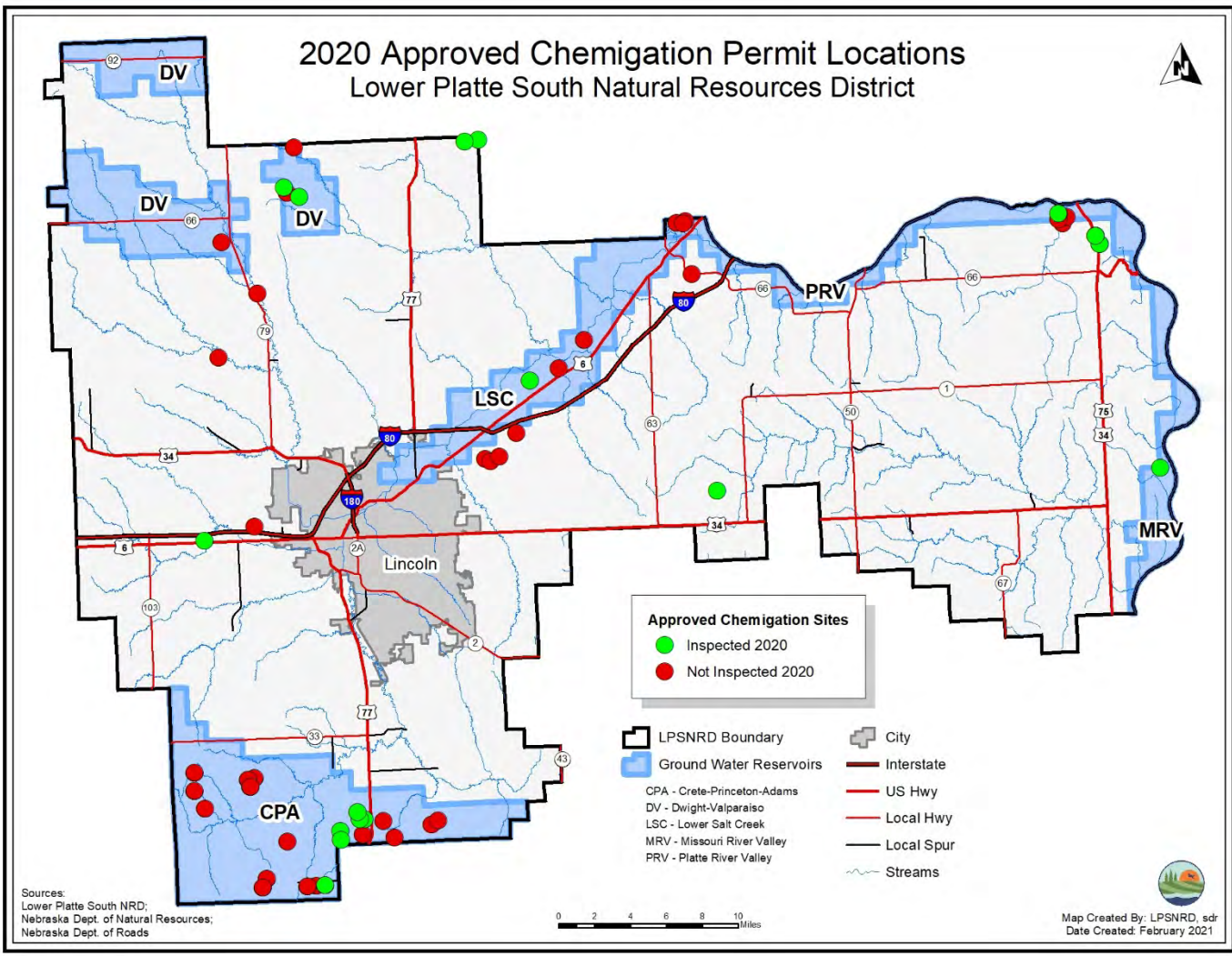


# 2020 Chemigation Program

- Issued 56 renewal permits
  - District-wide total of 5,118 acres permitted for chemigation
- Completed 21 inspections; no violations found



## 2020 Approved Chemigation Permit Locations Lower Platte South Natural Resources District



groundwater Reservoir	# of Chemigation Permits	# of Acres
Crete-Princeton-Adams	22	2,541
Dwight-Valparaiso	4	522
Lower Salt Creek	3	228
Missouri River Valley	1	95
Platte River Valley	6	338
Remaining Area	18	1,207

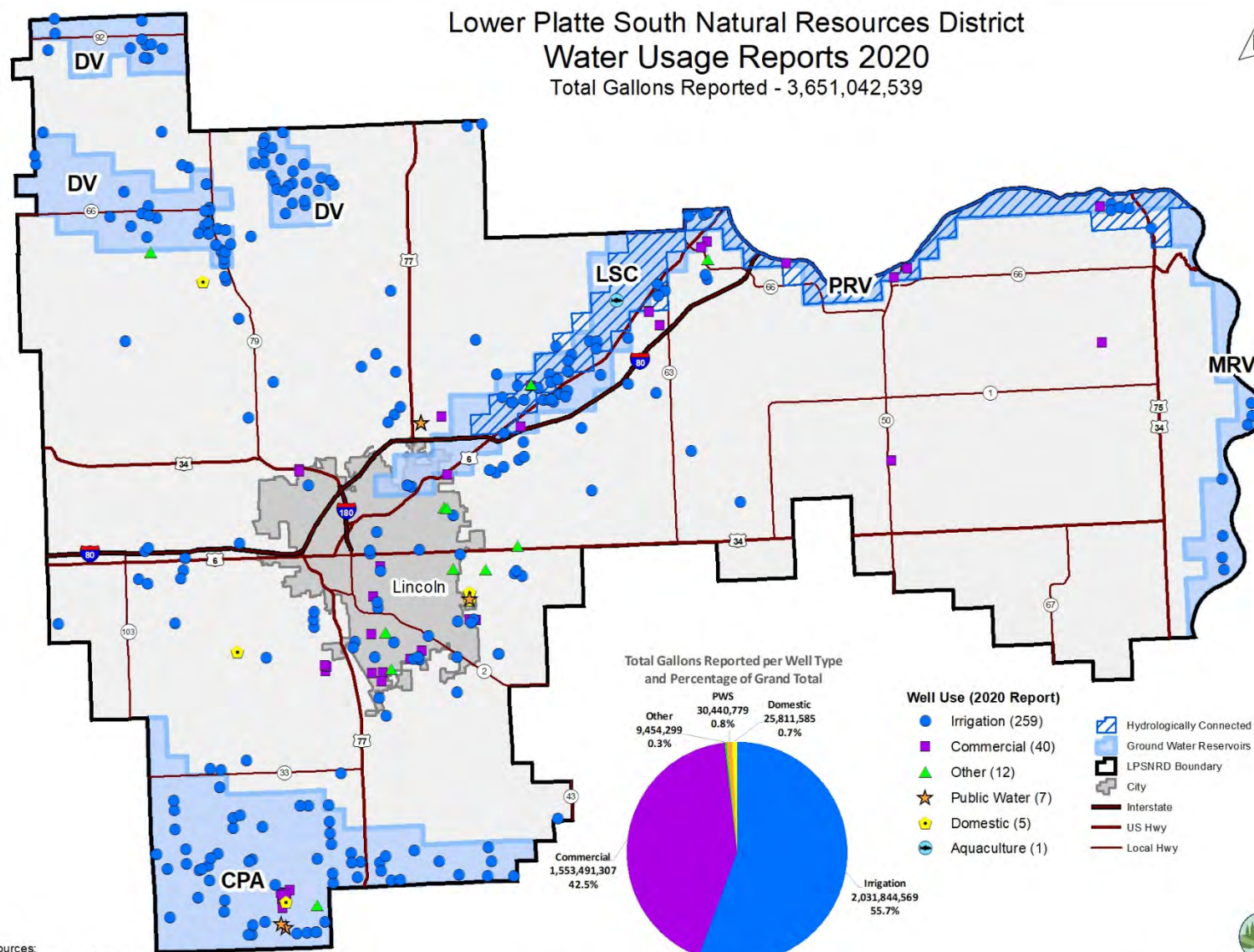
# 2020 Water Meter Program Highlights

- 1/30/2011 deadline; regulations now require that meters be in place BEFORE well use
- 50% cost-share up to \$650
- No cost-share applications in 2020
- 10<sup>th</sup> year of annual reporting
  - 324 reports received in 2020
  - Calculations of water pumped

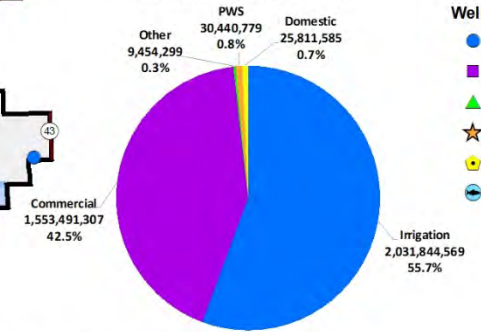


# Lower Platte South Natural Resources District Water Usage Reports 2020

Total Gallons Reported - 3,651,042,539



Total Gallons Reported per Well Type  
and Percentage of Grand Total



- Well Use (2020 Report)**
- Irrigation (259)
  - Commercial (40)
  - ▲ Other (12)
  - ★ Public Water (7)
  - Domestic (5)
  - Aquaculture (1)

- Hydrologically Connected Area
- Ground Water Reservoirs
- LPSNRD Boundary
- City
- Interstate
- US Hwy
- Local Hwy

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



  
Map Created By: LPSNRD, sdr  
Date Created: March 2021

3.6 B gallons = 134,456 acre-inches = 11,204 acre-feet  
(74,827 acre-inches/6,235 acre-feet for irrigation wells)



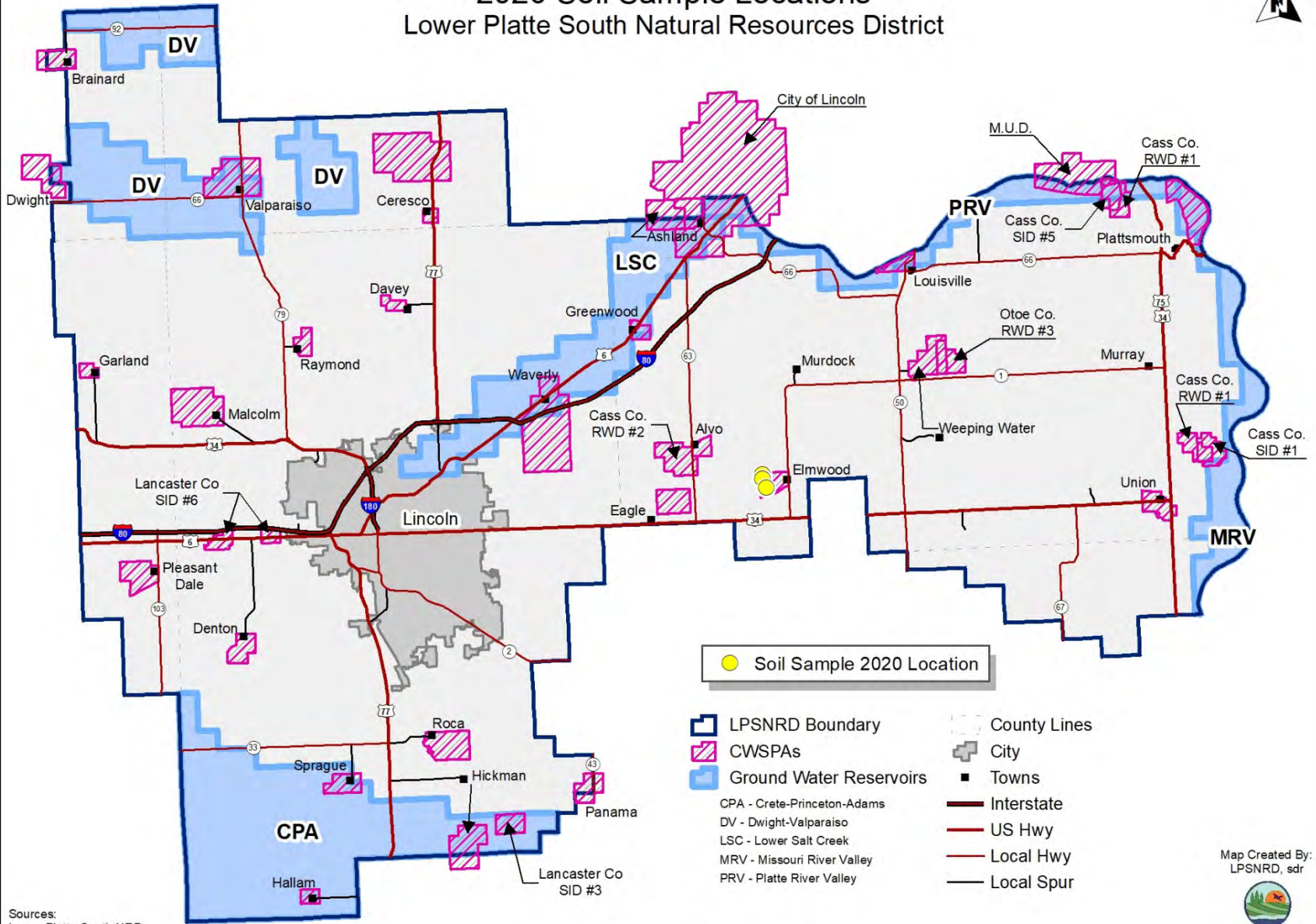
# 2020 Soil Sampling Program Highlights

- Important to measure residual soil nitrate and adjust fertilizer application accordingly
- Required in Elmwood Phase III area
- Received and approved 3 applications in 2020



# 2020 Soil Sample Locations

## Lower Platte South Natural Resources District



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



Map Created By:  
 LPSNRD, sdr



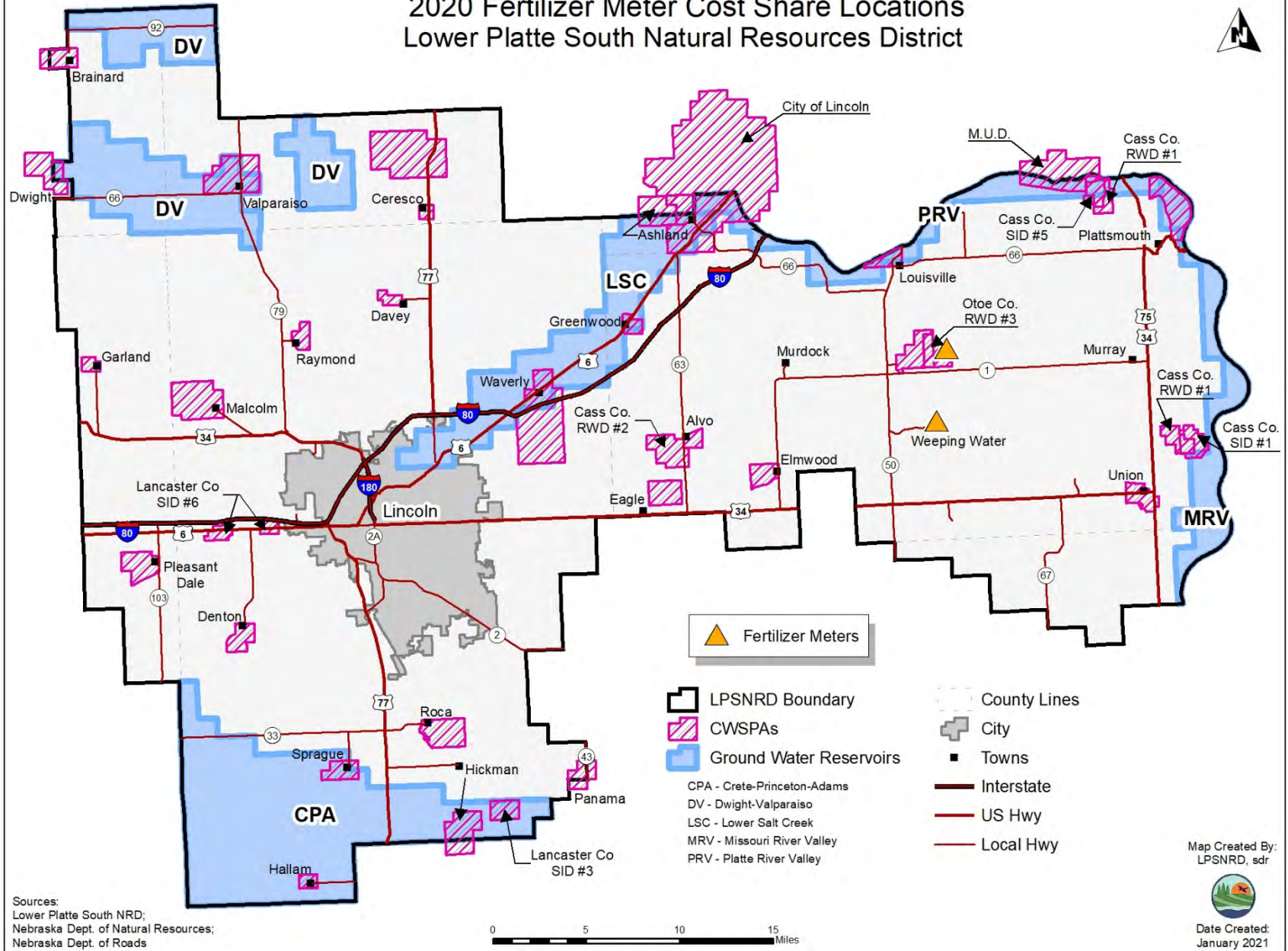
Date Created:  
 January 2021

# 2020 Fertilizer Meter Program Highlights

- Received & cost-shared on 2 applications



# 2020 Fertilizer Meter Cost Share Locations Lower Platte South Natural Resources District



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

Map Created By:  
LPSNRD, sdr



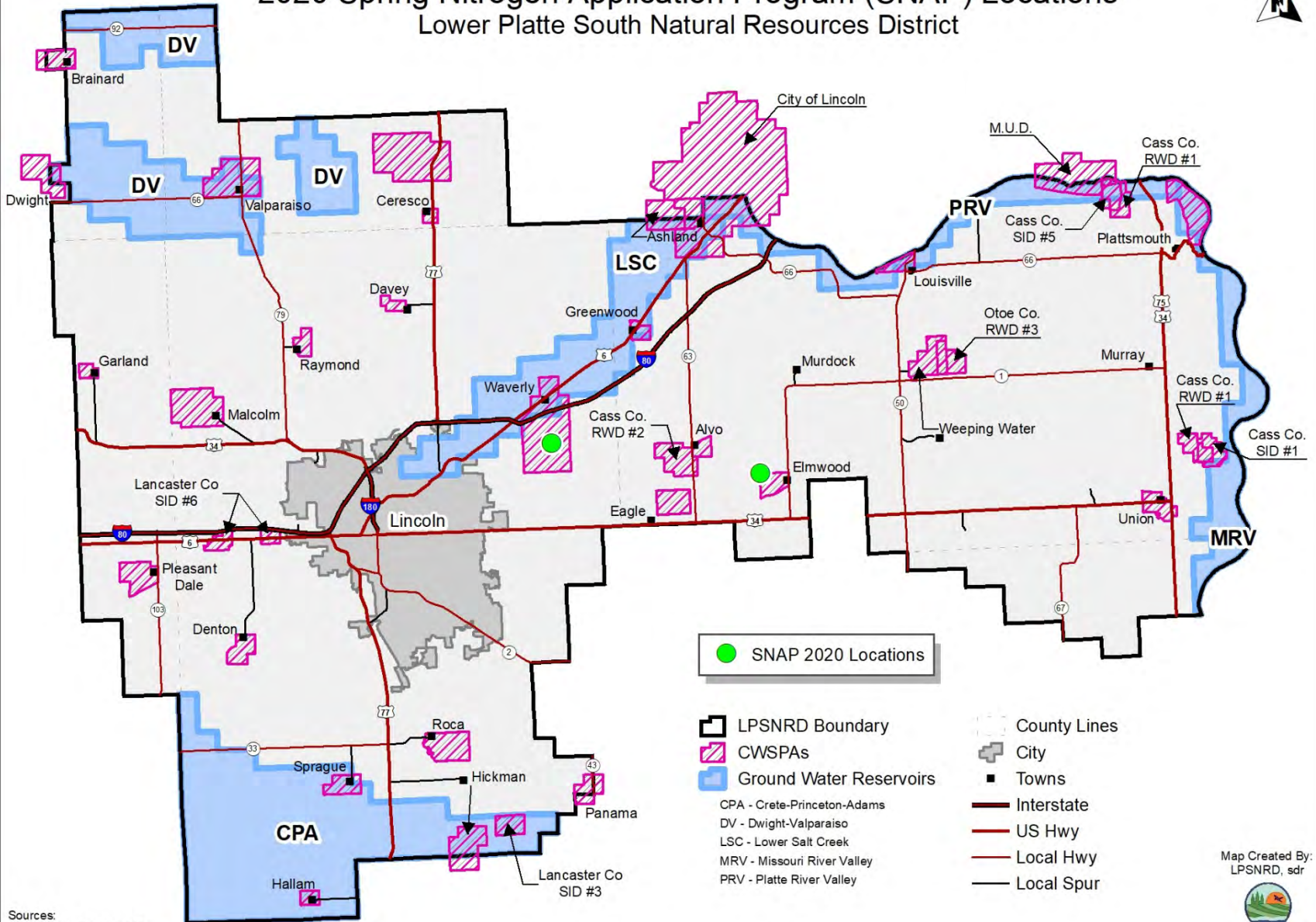
Date Created:  
January 2021

# 2020 Spring Nitrogen Application (SNAP) Highlights

- Program encourages spring application of N fertilizer by offsetting spring fertilizer costs (higher than fall costs)
- 2 applications received & approved in 2020



# 2020 Spring Nitrogen Application Program (SNAP) Locations Lower Platte South Natural Resources District



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



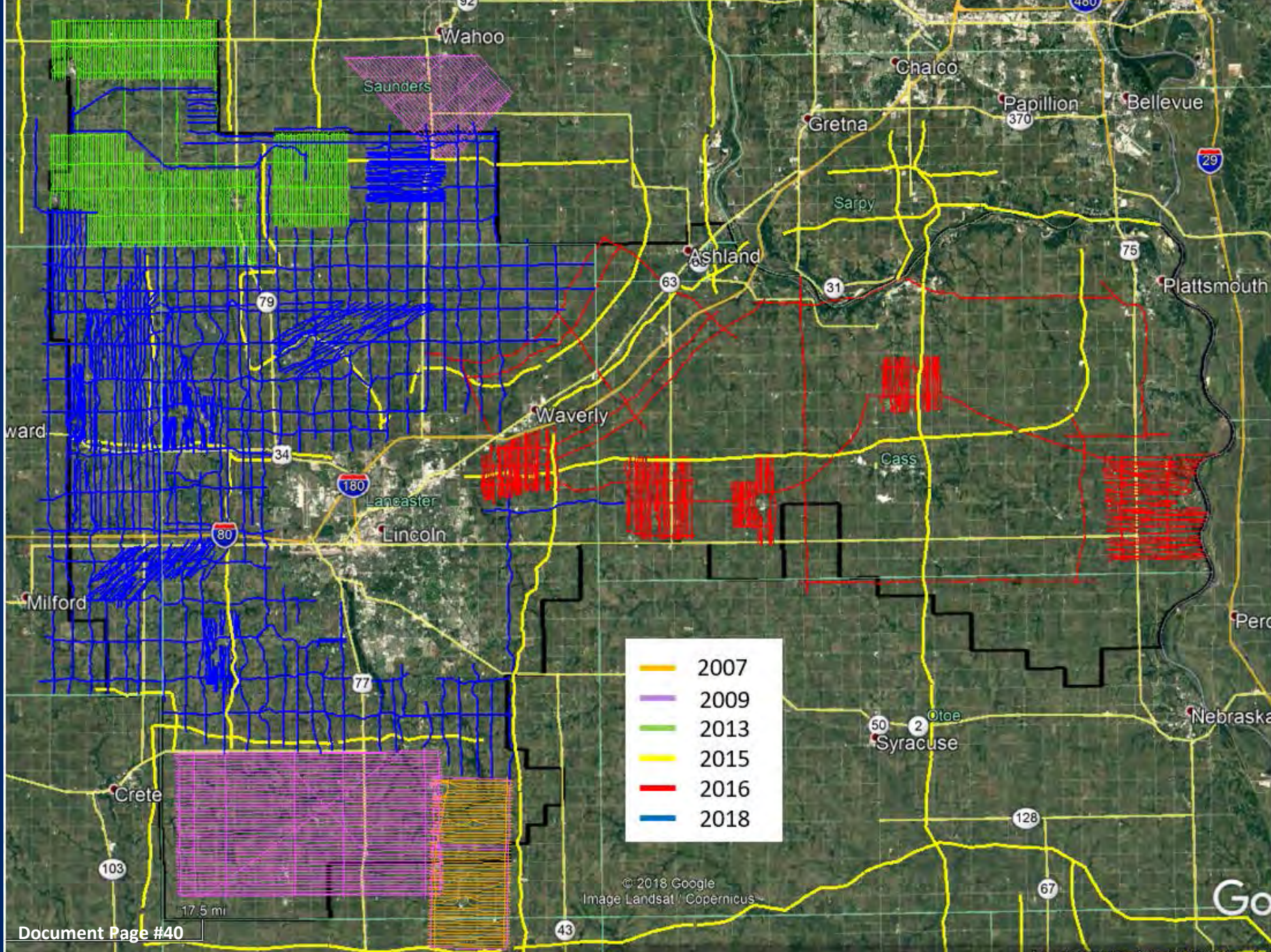
Map Created By:  
 LPSNRD, sdr



Date Created:  
 January 2021

# 2020 Miscellaneous Activities

- Variety of I/E & Public Information Activities
  - School activities severely curtailed by COVID pandemic
  - Classroom presentations (675 students), commercials, 3 Test Your Well Nights, activities/games (mostly virtual), etc.
- Continued participation in ENWRA
  - Continued analysis/development of AEM data & applications, especially 3-D projects in GeoScene
  - Cooperation w/ USGS on various studies
  - Ongoing meetings, website, data collection, etc.
- Research
  - UNL Vadose Zone project data collection curtailed in 2020 due to COVID pandemic
  - Integration of AEM into NRD groundwater projects



© 2018 Google  
Image Landsat / Copernicus

17.5 mi



# THANKS!!!!!!

- Steve Herdzina
- Chris Witthuhn
- Maclane Scott
- Dan Schulz
- Shaula Ross
- Katie Cameron
- Mike Mascoe
- McKenzie Barry
- Adam Sutton

# QUESTIONS?

