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# 2022 GROUND WATER QUALITY MONITORING REPORT

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South Platte Natural Resources District



DECEMBER 7, 2022

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## Nitrates in Drinking Water

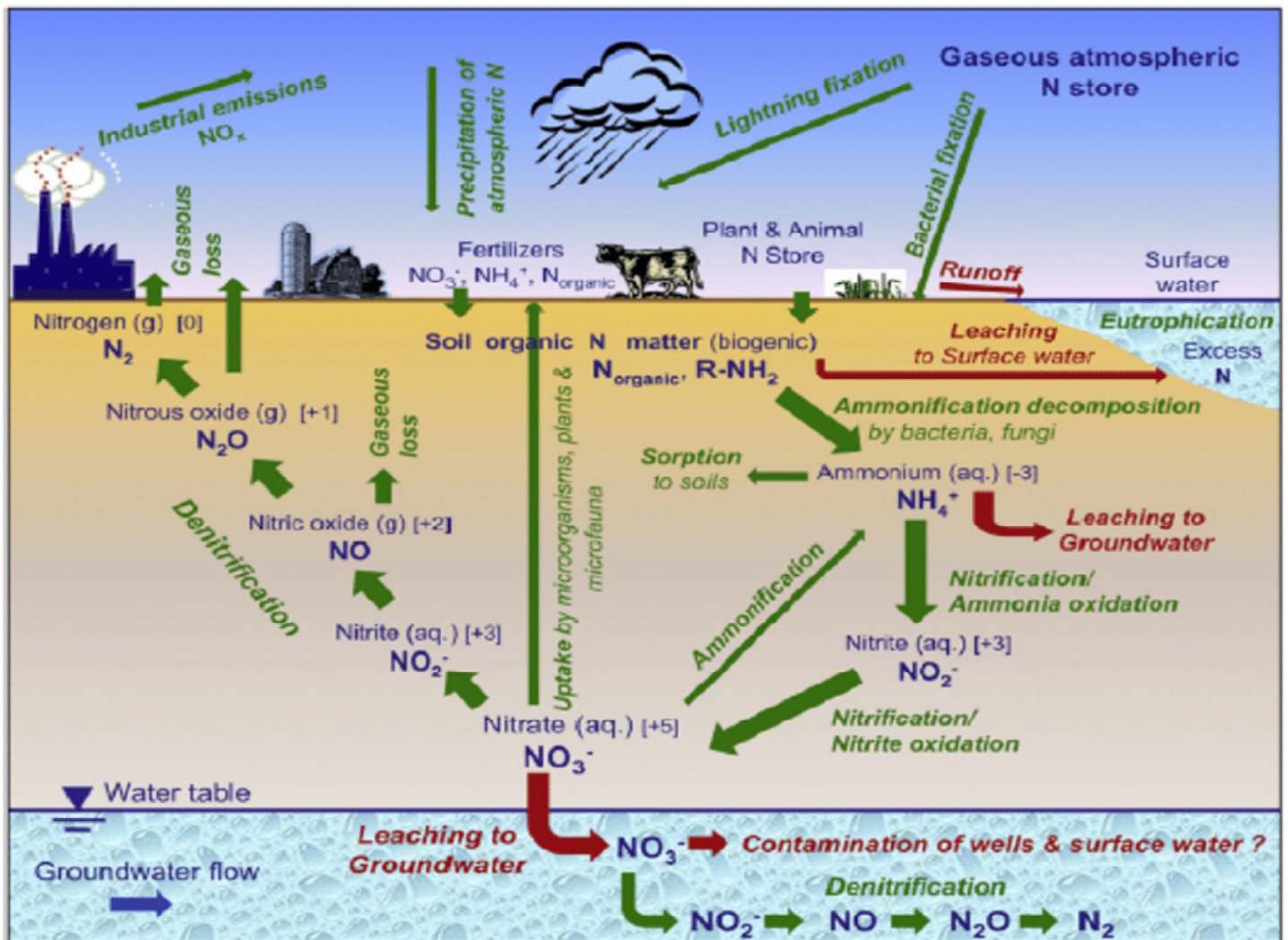
Nitrate levels are regulated within the SPNRD primarily because excess levels can cause methemoglobinemia, or “blue baby” disease. This sickness is extremely rare, but it is important to be aware of the risks. Nitrate levels that affect infants do not pose a direct threat to older children and adults until nitrate levels exceed 100 ppm, but the effect on any given person depends on many factors. (Source: Cornell University Cooperative Extension).

Methemoglobinemia is the most significant health problem associated with nitrate in drinking water. During the process of reduction, nitrite ( $\text{NO}_2$ ) can be formed from nitrate ( $\text{NO}_3$ ). When nitrite is present, hemoglobin (which is an iron-based compound which carries oxygen) can be converted to methemoglobin (which cannot carry oxygen). When oxygen cannot be carried through the blood stream, the skin turns blue and brain damage or death can occur.

The current standard for nitrate in drinking water is set at 10 ppm. Because potential health risks are often unknown or hard to predict, many drinking water standards are set at some fraction of the level of “no-observed adverse health effects”. In general, the greater the uncertainty about potential health effects, the greater the margin of safety built into the standard.

Nitrate in groundwater originates primarily from synthetic fertilizers, septic systems, and manure. Nitrogen that is not taken up by plants, volatilized, or carried away by surface runoff can leach below the root zone in the form of nitrate and contaminate drinking water sources.

## Nitrogen Cycle



## Summary

This report summarizes the 2022 ground water quality monitoring program for the South Platte Natural Resources District (SPNRD).

The SPNRD has completed its thirty-fourth year of monitoring nitrates in the District. Of the 167 network wells in this report, 147 were sampled at least once this year. This breaks down to 45 of 53 domestic wells, 71 out of 79 irrigation wells, 26 out of 27 dedicated monitoring wells, and five out of eight municipal wells. The municipal nitrate information is collected by the city of Sidney, and they allow the NRD to use their data for this report. Some irrigation wells were unable to be sampled for the following reasons: EQIP/CREP practices (2), the well is no longer being used (4), and my error in not getting them on my sampling maps (2). Most irrigation users have also gone to a set irrigation schedule which makes it difficult to catch those systems running. The domestic wells that were not sampled for the following reasons: no power to the well (4), locked gates (1), and my error in not getting them on my sampling maps (3). The one monitoring well that wasn't sampled was dry. The three municipal wells that were not sampled were because the city no longer uses them in their water system and therefore isn't required to sample them anymore.

There are 62 monitoring wells established on the tablelands that are not considered in the network. All these wells have been sampled within the last few years. Except for three wells, nitrate results in these wells fall between 1-3 parts per million (ppm).

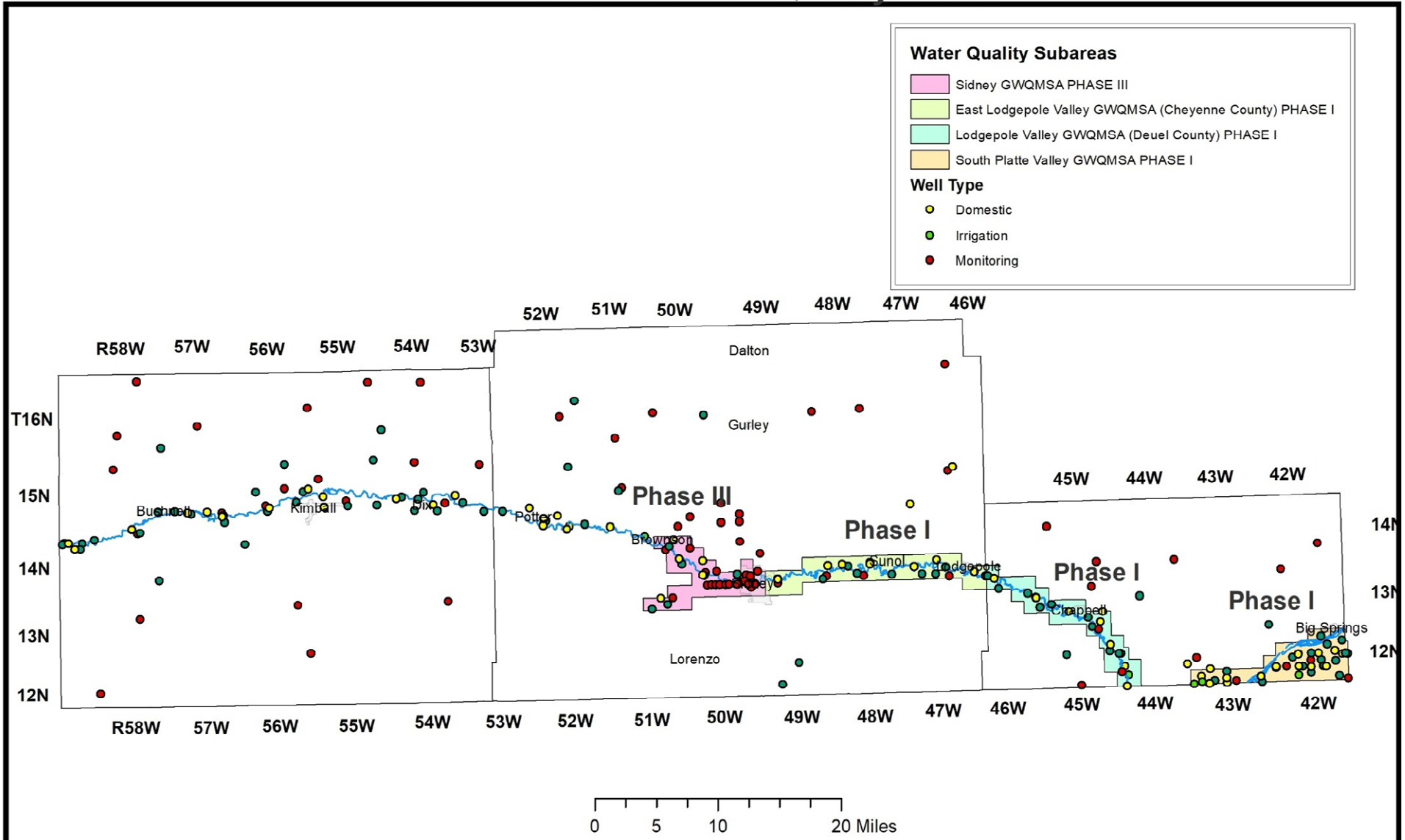
Quality Assurance/Quality Control (QA/QC) measures were followed during nitrate sampling. The primary method used for QA/QC was duplicate sampling. One duplicate was taken for every ten samples. The relative percent difference (RPD) was determined from the two duplicate samples. An average of this percent is then calculated for all the RPD's. This year's average was 1.59% for 29 duplicate samples. According to Ward Laboratories, the most precise data will fall within the 0-10% range.

Attached in this report is a map indicating the current SPNRD ground water quality management subareas and the management area phase those subareas are in.

Items to take into consideration when reviewing the following information obtained in this report:

- The Sidney GWQMSA is in a Phase III management control (three consecutive years over the 95% MCL trigger). Producers in this area are required to abide by the District's Nitrogen Reporting Program.
- This is the third consecutive year that the South Platte Valley GWQMSA has been over the 80% MCL trigger, and next month we will discuss if the board wants to elevate this subarea from Phase I to Phase II – this will take a rule change to complete.
- Nitrate levels have been steadily increasing in areas along the Lodgepole Creek in Kimball county between Pine Bluffs, WY and Bushnell. Currently, there are no ground water quality management areas designated in Kimball county. The rules state that a subarea needs to be no less than 16 square miles and 4 monitoring wells will be sampled before a Phase area is triggered. As a reminder our Phases are as follows:
  - Phase I – nitrate-nitrogen levels of 6.5 ppm average for 3 consecutive years
  - Phase II – nitrate-nitrogen levels of 8.0 ppm average for 3 consecutive years
  - Phase III – nitrate-nitrogen levels of 9.5 ppm average for 3 consecutive years

# SPNRD Ground Water Quality Subareas



**Water Quality Subareas**

- Sidney GWQMSA PHASE III
- East Lodgepole Valley GWQMSA (Cheyenne County) PHASE I
- Lodgepole Valley GWQMSA (Deuel County) PHASE I
- South Platte Valley GWQMSA PHASE I

**Well Type**

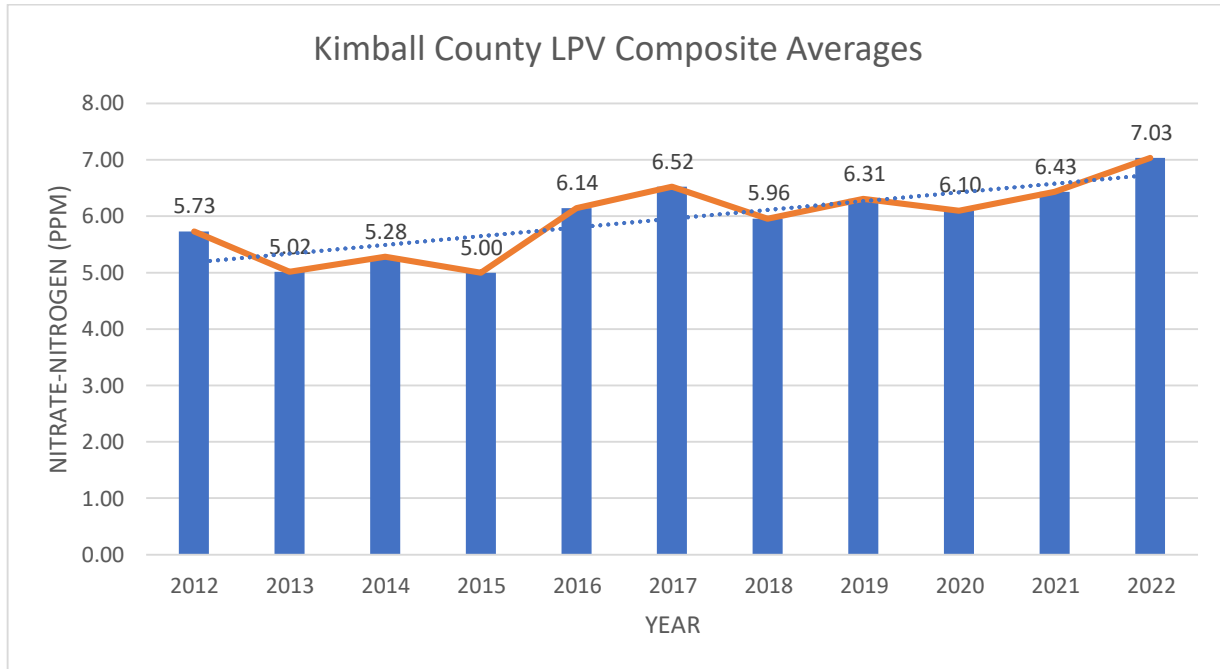
- Domestic
- Irrigation
- Monitoring

## NITRATE AVERAGES FOR TARGET SUBAREAS OF THE DISTRICT

Target Area	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
City of Sidney Municipal Wells	11.64	9.82	9.83	9.82	11.38	12.89	12.75	13.00	13.44	12.96
Sidney Draw Trigger Monitoring Wells	10.22	9.88	10.53	10.49	11.10	11.74	11.82	13.70	14.58	14.30
Sidney GWMA Network Wells	4.55	4.61	4.72	6.91	7.05	8.04	8.39	10.46	9.71	9.06
<b>Composite Average SGWQMSA (Phase II)</b>	<b>9.03</b>	<b>8.01</b>	<b>8.40</b>	<b>8.97</b>	<b>9.77</b>	<b>10.56</b>	<b>10.55</b>	<b>12.16</b>	<b>12.10</b>	<b>11.06</b>
East Lodgepole Valley GWMA Network Wells	7.51	7.52	7.33	7.18	7.25	7.22	6.64	7.25	6.92	7.56
East Lodgepole Valley Monitoring Wells	9.99	8.57	7.45	8.65	9.99	10.03	9.00	8.90	9.20	8.70
<b>Composite Average East Lodgepole Valley GWQMSA (Phase I)</b>	<b>8.00</b>	<b>7.74</b>	<b>7.36</b>	<b>7.51</b>	<b>7.85</b>	<b>7.92</b>	<b>7.31</b>	<b>7.66</b>	<b>7.49</b>	<b>7.82</b>
West Lodgepole Valley Cheyenne County	3.90	3.71	3.43	4.13	5.07	4.16	3.86	3.49	3.71	4.84
South Platte Valley GWMA Network Wells	8.63	8.97	8.75	9.98	8.50	9.29	8.70	10.32	9.97	10.38
South Platte Valley Monitoring Wells	5.90	5.32	4.73	4.42	3.90	3.82	3.92	4.87	5.38	5.07
<b>Composite Average South Platte Valley GWQMSA (Phase I)</b>	<b>8.02</b>	<b>8.21</b>	<b>7.89</b>	<b>8.79</b>	<b>7.55</b>	<b>8.20</b>	<b>7.74</b>	<b>9.23</b>	<b>8.95</b>	<b>9.28</b>
Lodgepole Valley (DC) GWMA Network Wells	5.69	6.16	6.36	7.57	6.90	7.21	6.76	6.61	5.24	6.84
Lodgepole Valley (DC) Monitoring Wells	5.73	5.23	4.90	3.88	3.10	3.03	3.40	3.78	3.08	4.25
<b>Composite Average Lodgepole Valley GWQMSA Deuel County (Phase I)</b>	<b>5.70</b>	<b>5.93</b>	<b>6.00</b>	<b>6.70</b>	<b>5.73</b>	<b>6.01</b>	<b>5.80</b>	<b>5.98</b>	<b>4.70</b>	<b>6.23</b>
Lodgepole Valley (KC) Network Wells	4.68	5.00	4.73	5.97	6.24	5.87	6.53	6.06	6.08	6.90
Lodgepole Valley (KC) Monitoring Wells	6.63	6.27	5.71	6.68	7.55	6.26	5.61	6.27	7.89	7.66
<b>Composite Average Lodgepole Valley (KC)</b>	<b>5.02</b>	<b>5.28</b>	<b>5.00</b>	<b>6.14</b>	<b>6.52</b>	<b>5.96</b>	<b>6.31</b>	<b>6.10</b>	<b>6.43</b>	<b>7.03</b>

**Kimball County Lodgepole Valley Composite Averages**

Well Type	Well ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Domestic	D017	0.27	0.15	0.15	0.10	0.10	0.15	0.30	0.10	0.15	0.15	0.20
	D003	4.80	5.30	5.40	5.65	7.10	9.20	10.00	10.90	11.50	11.75	12.60
	D027	6.40	5.80	5.65	5.83	5.85	6.30	6.05	6.90	7.60	7.50	11.85
	D018	0.90	2.85	0.70	0.70	1.53	0.77	0.90	0.60	0.40	0.50	0.55
	D030						10.95	10.05	9.85	10.30	9.80	11.40
	D022	3.97	4.05	4.05	3.90	4.15	4.70	4.40	4.20	4.45	4.40	5.20
	D038	5.40	3.80	4.55	4.20	6.20	7.80	3.77	4.10	3.95	3.30	4.80
	D004	7.32	7.77	7.97	8.10	9.40	11.90	14.40	18.85	18.50	20.23	22.55
	D029	4.40	3.40	4.30	7.37	7.20	6.80	5.95	5.35	3.90	3.60	4.77
	D014	7.30	6.05	5.40	6.00	6.23	9.45	6.40	8.45	7.55	6.25	6.45
	D007	4.90	5.25	5.65	5.10	5.90	6.00	4.60	4.45	4.80	4.50	5.67
	D016	0.80	2.25	2.30	1.80	0.20	0.20	0.25	0.10	0.20	0.10	0.20
	D043	6.20	6.20	7.30	8.00	7.70	10.45	10.95	11.23	12.05	12.50	12.45
	D044	12.60	10.13	11.03	10.45	13.73	11.00	9.35	8.50	9.53	9.40	10.03
	Irrigation	I011									3.60	
I013		3.10				3.40	2.80	2.90	2.20	2.30	2.30	2.55
I024		5.60	4.50	5.00	5.80	5.80	6.10	6.00		6.30	5.20	5.67
I039		7.20	6.80					9.40				9.40
I005		5.70	5.30	5.20						6.40	8.40	10.70
I006		6.20	6.30	7.20		9.00	9.80		13.50	14.10	15.15	16.47
I025		3.70	3.90	4.40								4.40
I041				2.70	2.80			3.10		3.60	4.40	3.60
I008							2.60	2.20	2.70	2.40	3.00	3.00
I037		6.15	5.80	4.80	5.10	6.30	6.60	7.20		7.95		8.60
I001			4.60				9.90					14.90
I045		11.10	2.70	3.30	3.40	3.70	3.50	3.80		4.20	3.40	3.95
I032						5.60	4.60	4.80		4.60	5.00	
I040		4.70	4.10	5.40	5.10	5.80	5.80	6.20	5.00	6.40	5.80	7.10
I042		13.10	7.20	11.20		17.00	12.00	15.90	14.10	12.60	8.00	5.30
I046	7.00	2.40	2.70	2.20	2.50	3.00	2.50		2.50	2.50	2.70	
I023	2.70	2.40	2.20						2.80	4.20	3.20	
I028	7.70	5.30	5.40	4.90	7.90	6.60	7.20	6.90	6.50	7.65	8.40	
I002	5.40	5.20	8.90			6.10	5.20			3.80	4.50	
I015	2.50	3.10	4.00	2.80	4.00	3.00	3.20	2.70	3.20		3.70	
I031	4.00	3.20	3.10		3.00	2.80	3.30	3.00	3.60	3.60	4.10	
Monitoring	K-1-D	5.50	5.60	5.90	4.80	6.00	5.90	4.30	4.50	4.20	5.90	5.50
	K-1-S	10.80		9.20	8.10	10.50	8.90	8.50				
	K-2	10.00	11.60	11.21	7.30	8.10	9.40	5.60	5.50	5.40	9.80	11.50
	K-3	8.35	7.60	6.20	10.50	9.30	12.50	8.70	4.50	8.90	9.60	9.10
	K-4	2.80	4.20	3.84	2.50	1.95	3.60	2.40	5.10	5.10	5.10	4.10
	K-5	2.70		2.62	2.40	2.50	2.60	2.30	2.60	3.10	3.20	3.10
	K-6-D	5.43	5.40	5.50	5.00	6.87	8.00	8.20	7.90	8.40	10.00	9.70
	K-6-S	5.40	5.40	5.70	5.10	8.20	9.50	10.10	9.20	8.80	11.60	10.60
<b>Average</b>		<b>5.73</b>	<b>5.02</b>	<b>5.28</b>	<b>5.00</b>	<b>6.14</b>	<b>6.52</b>	<b>5.96</b>	<b>6.31</b>	<b>6.10</b>	<b>6.43</b>	<b>7.03</b>

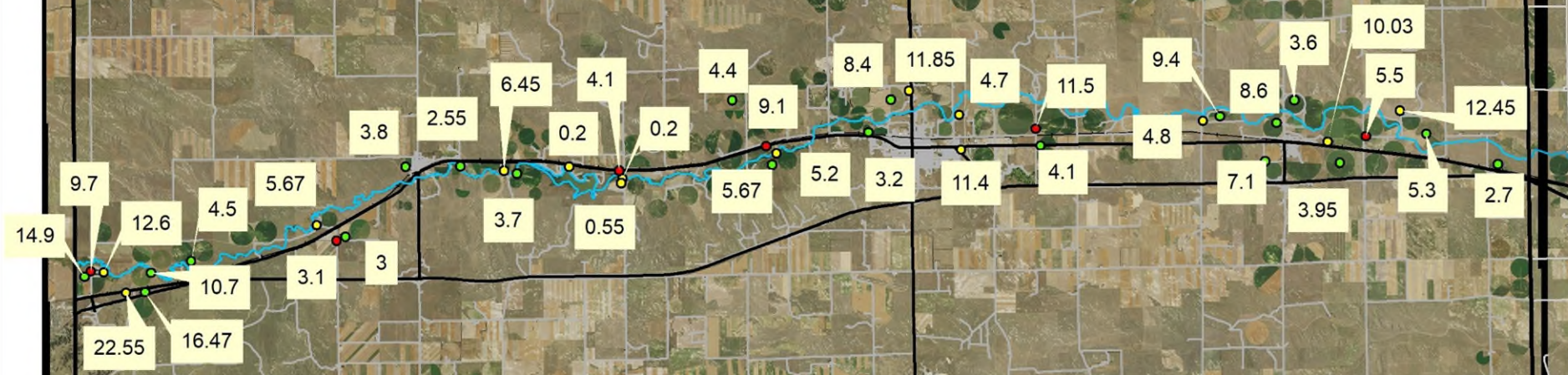


### Kimball County Tablelands

Well Type	Well ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Irrigation	I009	3.80	3.70	5.20	4.00	4.50					4.20	6.00
	I034	2.90	2.50	2.90	2.80		2.60			2.60		3.00
	I020	2.30	2.55	2.50	2.70	2.50	2.30	2.60	1.20	1.50	2.30	2.60
	I012	2.80	2.30	3.00	3.80		3.20	3.25	3.60	3.30	4.60	3.30
	I035	3.10	3.00	2.50	2.40	2.20			2.30			2.20
<b>Average</b>		<b>2.98</b>	<b>2.81</b>	<b>3.22</b>	<b>3.14</b>	<b>3.07</b>	<b>2.70</b>	<b>2.93</b>	<b>2.37</b>	<b>2.47</b>	<b>3.70</b>	<b>3.42</b>



# Kimball County Lodgepole Valley Nitrate Results

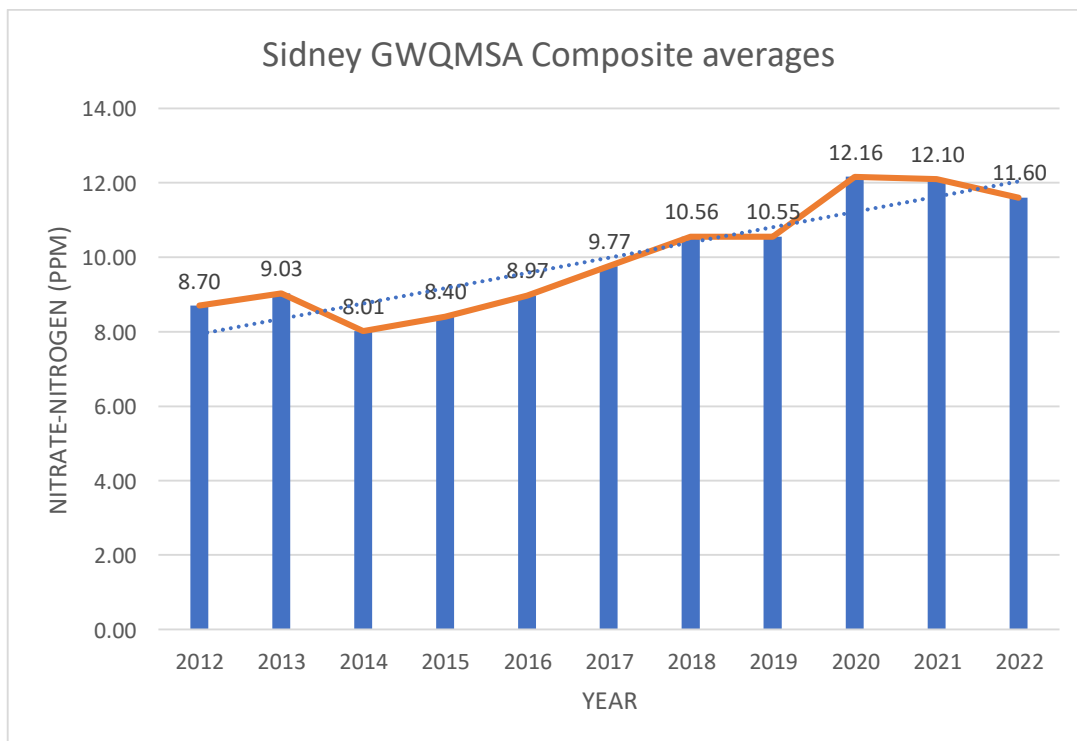


**Well Type**

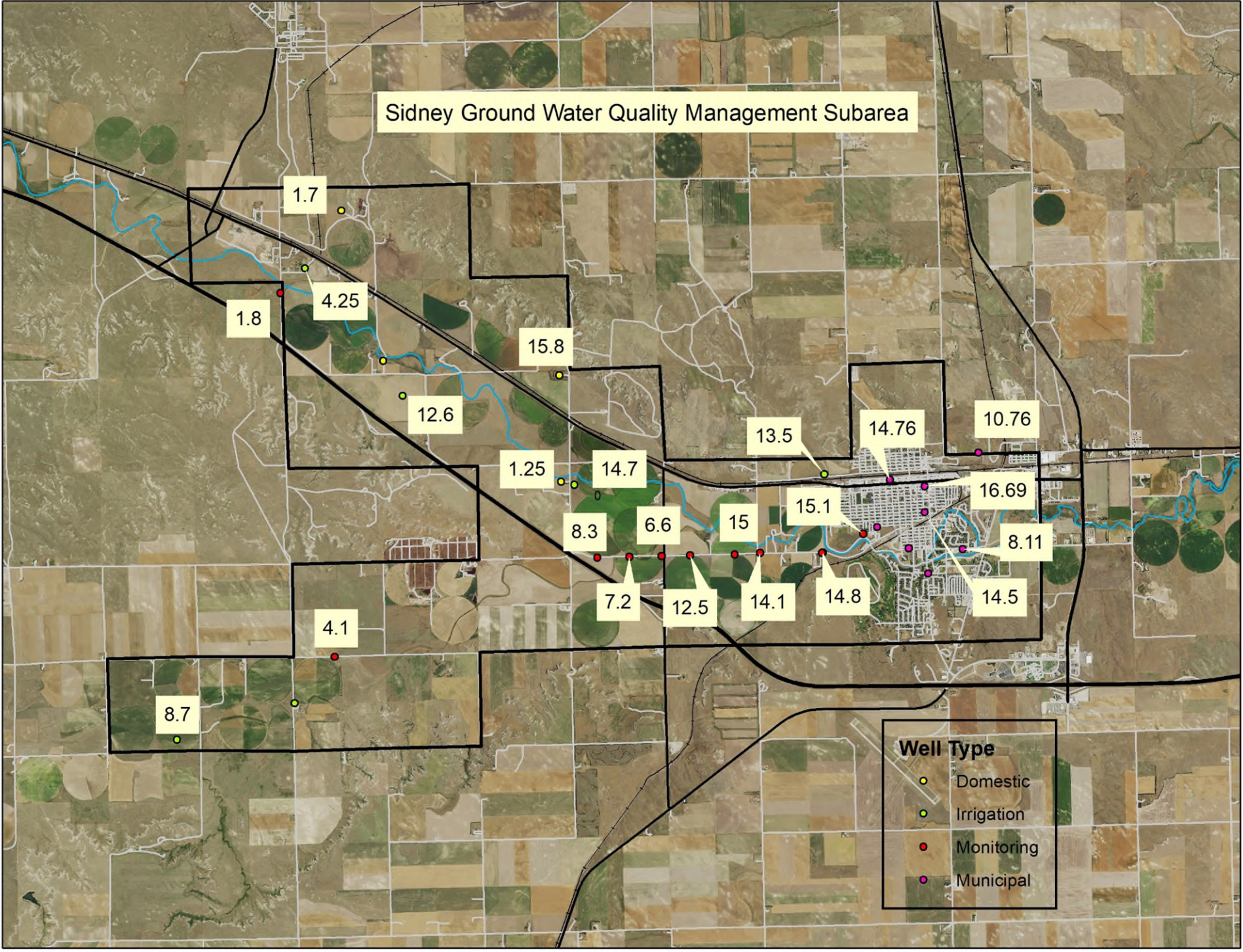
- Domestic
- Irrigation
- Monitoring

### Sidney Ground Water Quality Management Subarea Composite Averages

Well Type	Well ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Domestic	D068	1.00	2.95	0.95	8.40	7.05	8.15	6.85	9.20	13.30	8.47	1.25
	D069	5.70	5.15	5.95	5.30	10.05	6.65	8.65	6.80	12.60	13.55	15.80
	D060	1.10	1.55	1.20	1.05	0.95	1.70	2.30	1.20	2.70	1.90	1.70
	D058	6.90	5.95	7.40	5.45	6.45	6.60	9.50	8.27	6.85	9.15	
Irrigation	I061	4.40	3.80	3.40	3.80							4.25
	I063					5.40					9.30	8.70
	I067		7.90				9.50	12.50	11.10	11.70		14.70
	I059			8.90		10.10	9.70	9.40	11.40	14.50	13.50	12.60
	I070								11.75		11.60	13.50
	I064	5.50		4.50	4.30	8.40		7.10	7.40	11.60	10.20	
Municipal	SMW-1	13.63	13.85	10.42	10.85	11.87	13.95	14.26	13.65	13.72	14.69	14.76
	SMW-2	13.50	13.90	11.49	11.53	12.10	14.29	14.36	14.31	15.35	15.23	14.50
	SMW-3	14.20	14.70	11.44	11.60	10.51	14.30	16.16	16.09	15.85	17.12	16.69
	SMW-4	8.53	8.75	8.23	8.11	7.30						
	SMW-6	14.17	14.10	12.03	12.15	10.50	7.49					
	SMW-7	10.80	10.35	9.06	8.35	9.90						
	SMW-8	7.87	7.80	7.11	7.49	8.19	8.66	8.57	8.71	8.62	8.64	8.11
	SMW-9	9.13	9.70	8.78	8.58	8.15	9.56	11.12	11.00	11.47	11.51	10.76
	Monitoring	SD-10	9.50	10.30	9.90	10.07	10.05	10.80	10.20	11.10	13.40	14.10
SD-12-D		12.09	12.52	12.30	12.60	11.20	12.10	12.80	14.80	15.90	15.80	15.10
SD-4		8.00	8.60	8.24	8.95	11.35	12.40	13.70	10.90	11.50	12.10	12.50
SD-6		9.90	10.40	10.23	11.55	10.53	11.40	12.50	11.40	15.00	15.60	15.00
SD-7-D		9.32	9.30	8.74	9.50	9.30	8.80	9.50	10.90	12.70	15.30	14.10
<b>Average</b>		<b>8.70</b>	<b>9.03</b>	<b>8.01</b>	<b>8.40</b>	<b>8.97</b>	<b>9.77</b>	<b>10.56</b>	<b>10.55</b>	<b>12.16</b>	<b>12.10</b>	<b>11.60</b>



# Sidney Ground Water Quality Management Subarea



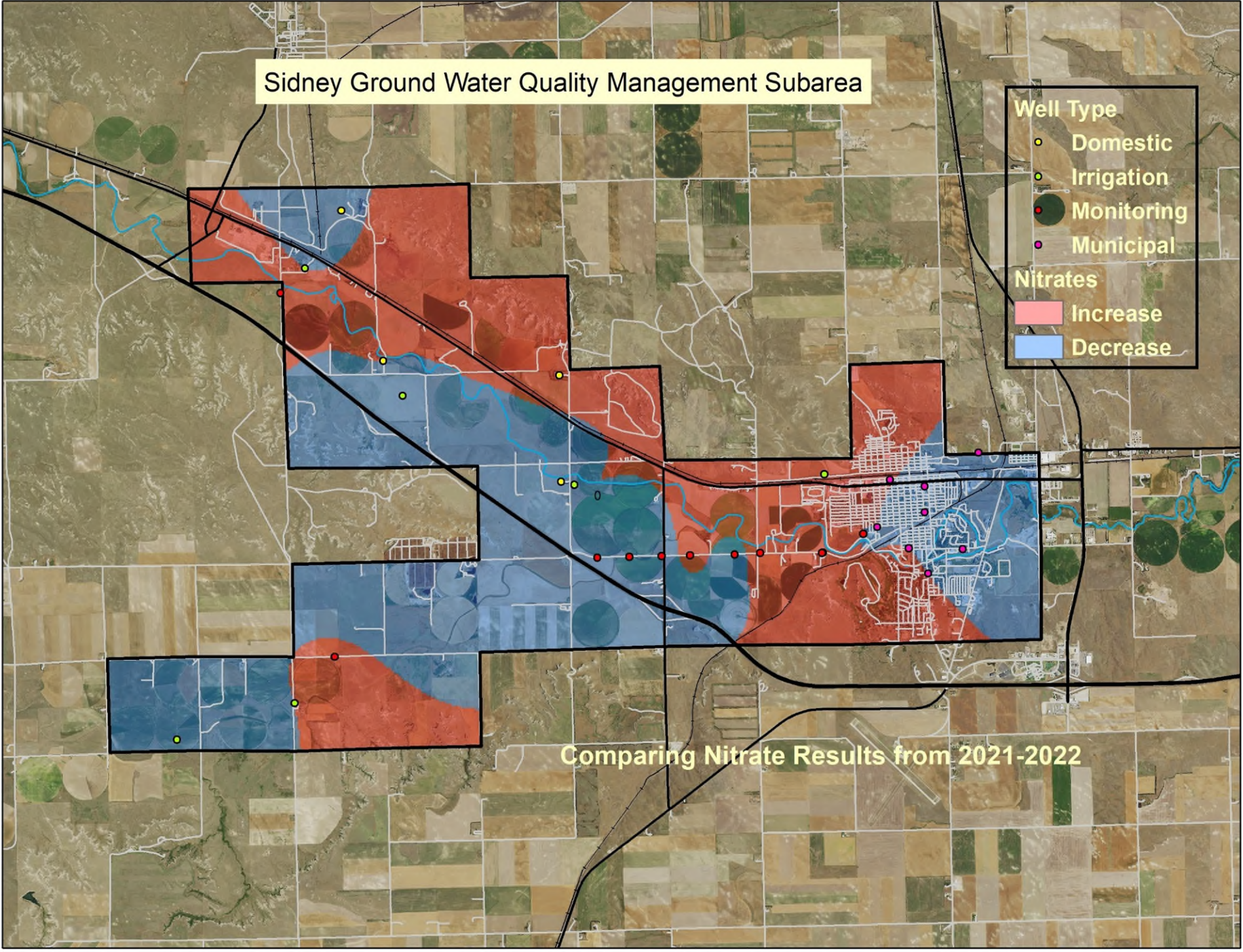
# Sidney Ground Water Quality Management Subarea

**Well Type**

- Domestic
- Irrigation
- Monitoring
- Municipal

**Nitrates**

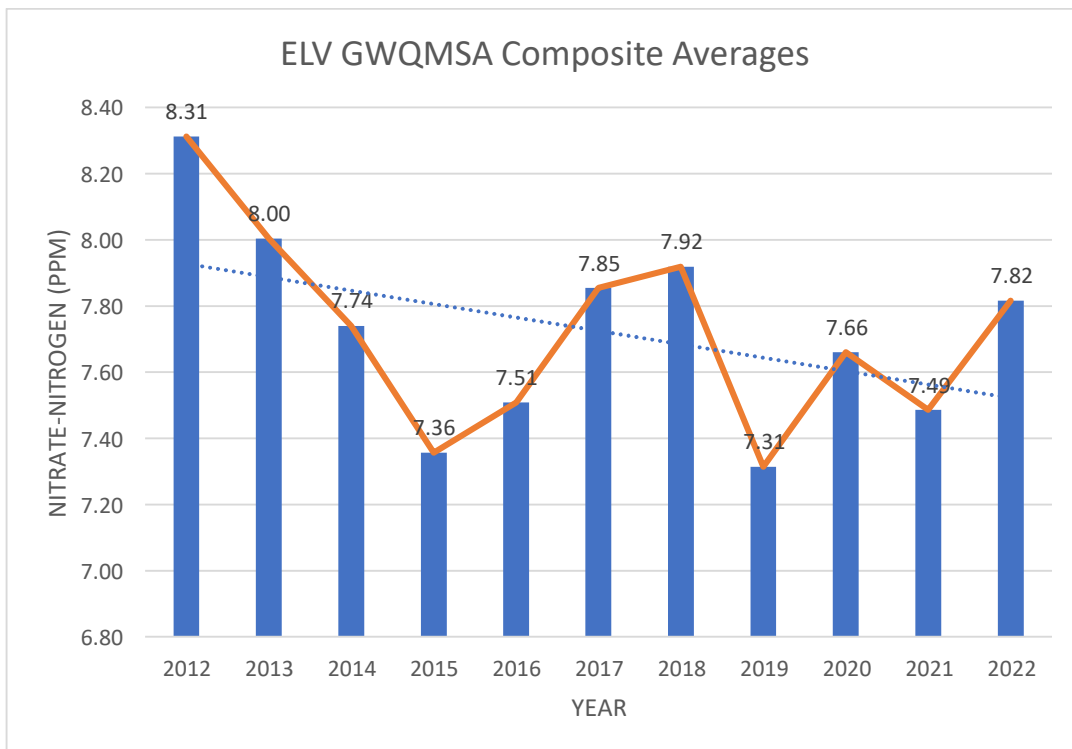
- Increase
- Decrease



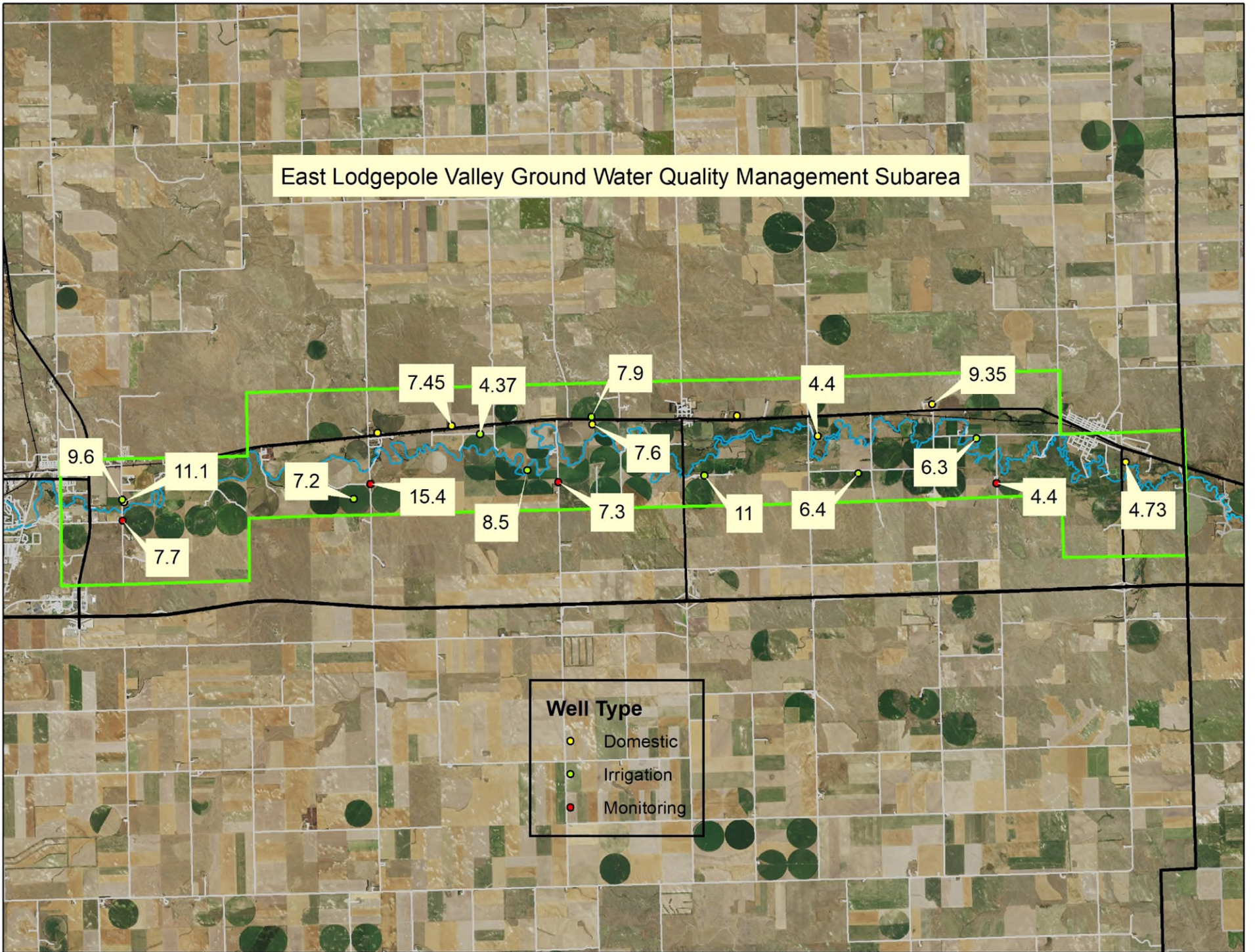
Comparing Nitrate Results from 2021-2022

### East Lodgepole Valley Ground Water Quality Management Subarea (Cheyenne County)

Well Type	Well ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Domestic	D152	6.90	6.10	8.00	7.40	7.80	7.20						
	D151	7.80	7.70	8.80	8.23	7.45	7.75	7.35	6.85	6.70	6.40	7.60	
	D153	5.40	4.90	4.55	4.50	4.40	6.43	5.40	4.20	3.63	3.43	4.40	
	D150	7.10	6.90	8.55	8.20	7.45	7.95	7.80	7.30	7.23	6.20	7.45	
	D082	13.55	13.25	14.55	10.75	13.60	11.30	10.10	11.70	10.65	9.20	11.10	
	D154	6.80	6.40	8.50	8.50	8.10	8.40	8.00	7.70	7.80	7.80	9.35	
	D146	4.00	3.40	4.20	4.00	4.05	4.50	4.05	3.60	4.05	3.80	4.73	
	D147	7.40	6.65	6.00			7.50						
Irrigation	I085	6.80	7.30	7.20	7.70	6.00	6.20	6.40	6.90		6.30	6.40	
	I157	13.10	11.10	12.60	13.45	9.30	13.60	13.50		13.70	11.50	11.00	
	I087	11.30	11.40	9.45	7.30	6.80	4.30	7.30		5.20	6.60	6.30	
	I130	7.30	6.30	6.30	6.90	6.60	6.20		7.05	9.00	9.00	8.50	
	I151	6.90	6.30	5.70	5.15	9.00		7.90	7.10	8.00	8.40	7.90	
	I148	5.45	6.80	5.20	5.00	6.50	6.70	5.90		7.60		7.20	
	I083	10.00	12.80		10.20								9.60
	I156	4.00	2.80	3.20	2.70	3.50	3.40	2.90	4.00	3.40	4.35	4.37	
Monitoring	E-1	5.65	5.10	4.94	3.30	4.10	4.30	5.50	5.10	4.00	4.40	4.40	
	E-2	14.05	6.85	6.50	6.00	5.80	5.40	6.00	6.40	5.60	7.00	7.30	
	E-3	16.10	20.95	15.23	14.30	19.10	23.40	21.30	17.90	19.60	18.10	15.40	
	E-4	6.65	7.07	7.60	6.20	5.60	6.85	7.30	6.60	6.40	7.30	7.70	
<b>Average</b>		<b>8.31</b>	<b>8.00</b>	<b>7.74</b>	<b>7.36</b>	<b>7.51</b>	<b>7.85</b>	<b>7.92</b>	<b>7.31</b>	<b>7.66</b>	<b>7.49</b>	<b>7.82</b>	



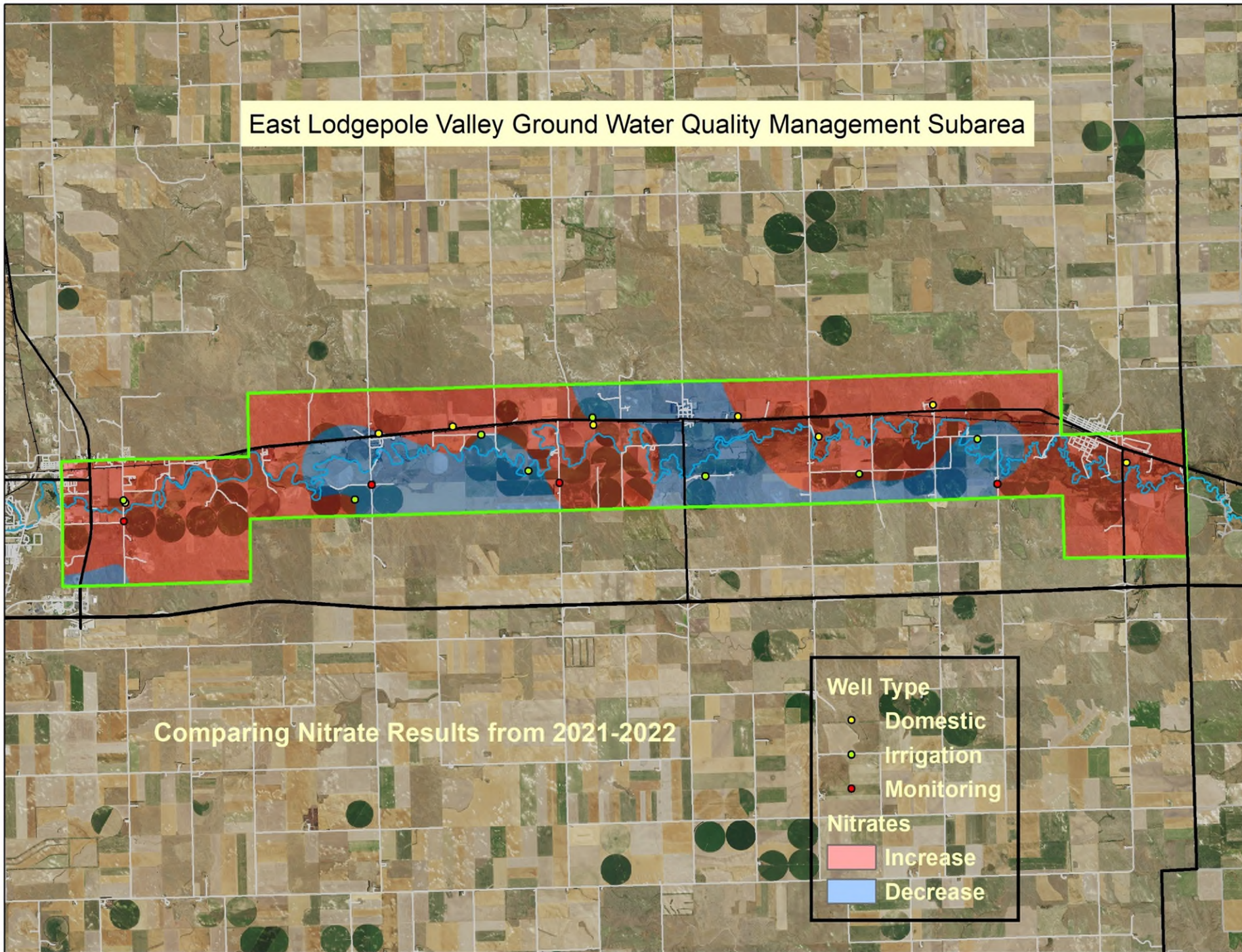
# East Lodgepole Valley Ground Water Quality Management Subarea



East Lodgepole Valley Ground Water Quality Management Subarea

Comparing Nitrate Results from 2021-2022

- Well Type
- Domestic
  - Irrigation
  - Monitoring
- Nitrates
- Increase
  - Decrease



### Cheyenne County West Lodgepole Valley

Well Type	Well ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Domestic	D051	13.00	10.25	7.70	5.13	6.20	6.80	6.90	5.80	3.70	5.40		
	D048	4.10	3.60	3.50	3.25	3.35	3.90	4.50	3.80	4.10	3.20	4.95	
Irrigation	D056	1.40	1.37	1.35	1.30	1.27	1.97	1.70	1.60	1.60	2.05	2.30	
	D053	1.70	1.55	1.45	1.35	1.20	1.70	1.60	1.30	3.50	1.45	1.75	
	D049	4.55	4.20	6.47	7.55	8.10	14.90	6.70	7.65	3.40	5.95	6.70	
	I047	7.30	3.90	3.70		7.00	5.90	6.30	5.40	6.50	8.20	7.05	
	I057	1.30	1.60	1.20	1.30	1.40	0.80	0.90	0.70	1.30	0.60		
	I050	4.80	5.00	5.00	4.10	4.50	4.60	4.70	4.60	3.85	2.80	7.30	
	I055	3.20	3.60	3.00									3.80
	<b>Average</b>		<b>4.59</b>	<b>3.90</b>	<b>3.71</b>	<b>3.43</b>	<b>4.13</b>	<b>5.07</b>	<b>4.16</b>	<b>3.86</b>	<b>3.49</b>	<b>3.71</b>	<b>4.84</b>

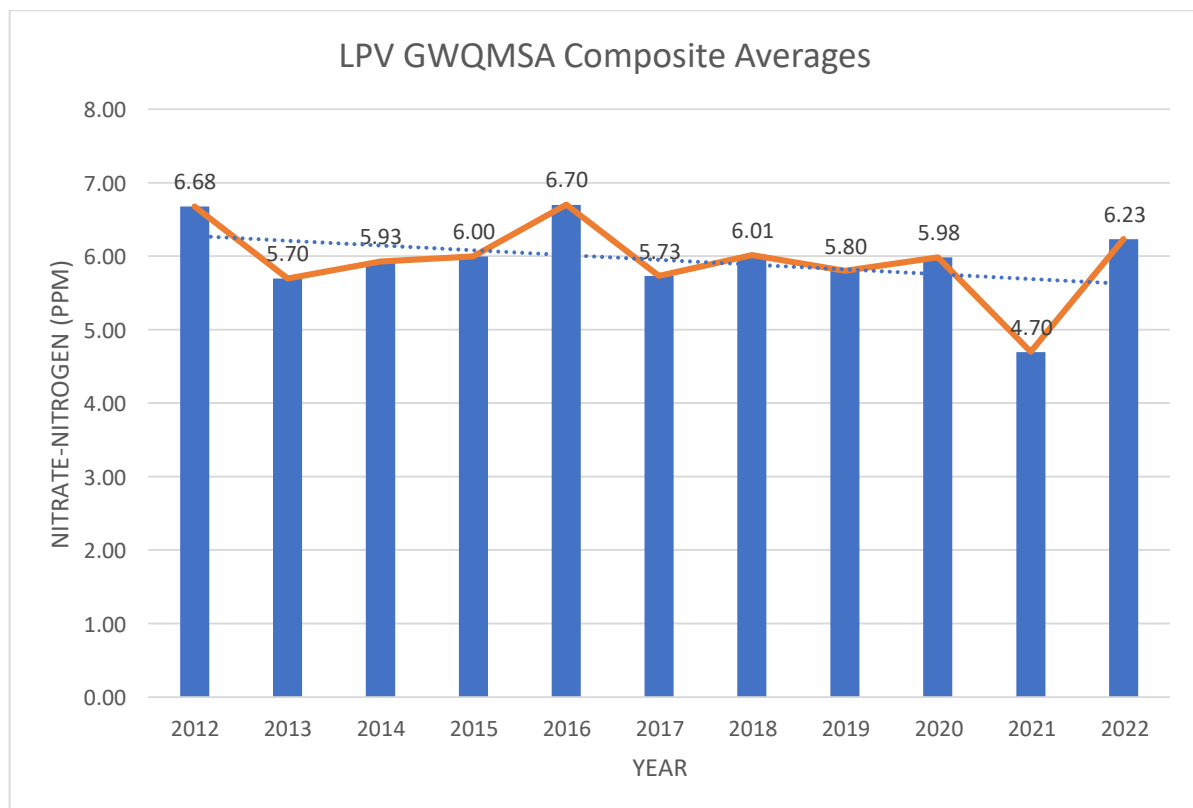
### Cheyenne County Tablelands

Well Type	Well ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Domestic	D122	5.40	5.80	6.60	6.85	6.90	7.30	7.70	6.65	6.10	6.65	7.80
Irrigation	I129	3.80								3.60		4.90
	I127				1.20	1.80	1.60				1.60	2.00
	I126									1.30		2.60
	I123				1.30				1.20			1.70
	I125					2.30	2.00	1.90		2.00		2.50
	I128				3.50		3.30					3.70
	<b>Average</b>		<b>4.60</b>	<b>5.80</b>	<b>6.60</b>	<b>3.21</b>	<b>3.67</b>	<b>3.55</b>	<b>4.80</b>	<b>3.93</b>	<b>3.25</b>	<b>4.13</b>

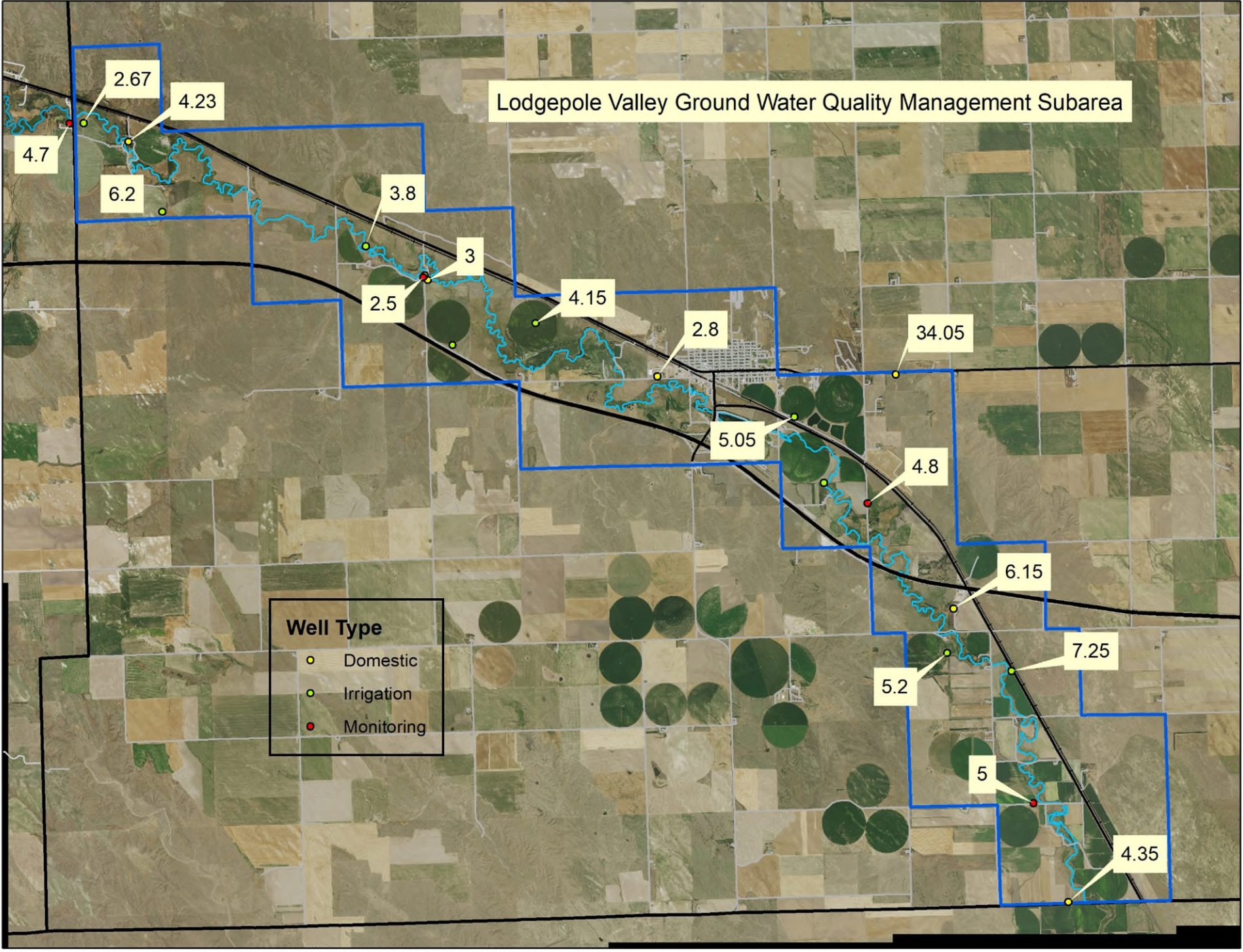


### Lodgepole Valley Ground Water Quality Subarea (Deuel County)

Well Type	Well ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Domestic	D101	5.33	5.25	8.70	5.70	6.60	3.75	3.00	1.75	1.90	3.40	4.35
	D090	6.90	4.75	4.10	4.70	6.10	6.10	5.00	4.20	5.40	3.95	4.23
	D098	5.53	5.95	5.60	5.00	5.05	5.55	5.25	5.10	5.10	4.63	6.15
	D094	4.10	3.70	4.20	4.20	4.20		4.20	3.85	3.80	2.50	2.80
	D097	25.57	24.20	15.90	20.00	27.80	20.40	23.15	31.25	33.00	20.70	34.05
	D092	2.17	1.85	2.30	1.73	2.05	1.90	1.35	2.75	2.35	0.95	3.00
Irrigation	I088	2.80	3.50	2.60	10.90	10.30				2.50	2.30	2.67
	I089	4.70	4.10	4.60	4.30	4.30			4.50	5.30	5.80	6.20
	I095	8.20	8.10	7.90				8.40				
	I132		4.50		4.00	8.20	6.70	6.30	4.00	4.60		5.20
	I158	9.70				1.90	4.30			6.60	3.40	7.25
	I093	9.90	2.30	7.00	8.00	7.80	8.50	9.10	5.40	5.90	8.10	
	I134	7.20	5.30	5.40	6.10	7.60	4.90	6.30	4.80	6.60	3.20	5.05
	I133	5.50	5.60	5.60		6.50				6.60	3.90	4.15
	I091	4.30	3.40		1.70							
	I135	3.30	2.80							2.90		3.80
Monitoring	D-6	9.00	10.45	9.10	7.40	3.30	0.90	1.10	2.80	4.10	0.50	5.00
	D-7	6.20	5.85	5.80	5.90	6.00	5.50	5.50	5.40	5.20	5.30	4.80
	D-8	2.45	2.60	2.10	2.30	1.90	2.10	2.00	1.80	2.10	2.30	2.50
	D-9	4.00	4.03	3.93	4.00	4.30	3.90	3.50	3.60	3.70	4.20	4.70
<b>Average</b>		<b>6.68</b>	<b>5.70</b>	<b>5.93</b>	<b>6.00</b>	<b>6.70</b>	<b>5.73</b>	<b>6.01</b>	<b>5.80</b>	<b>5.98</b>	<b>4.70</b>	<b>6.23</b>



# Lodgepole Valley Ground Water Quality Management Subarea



# Lodgepole Valley Ground Water Quality Management Subarea

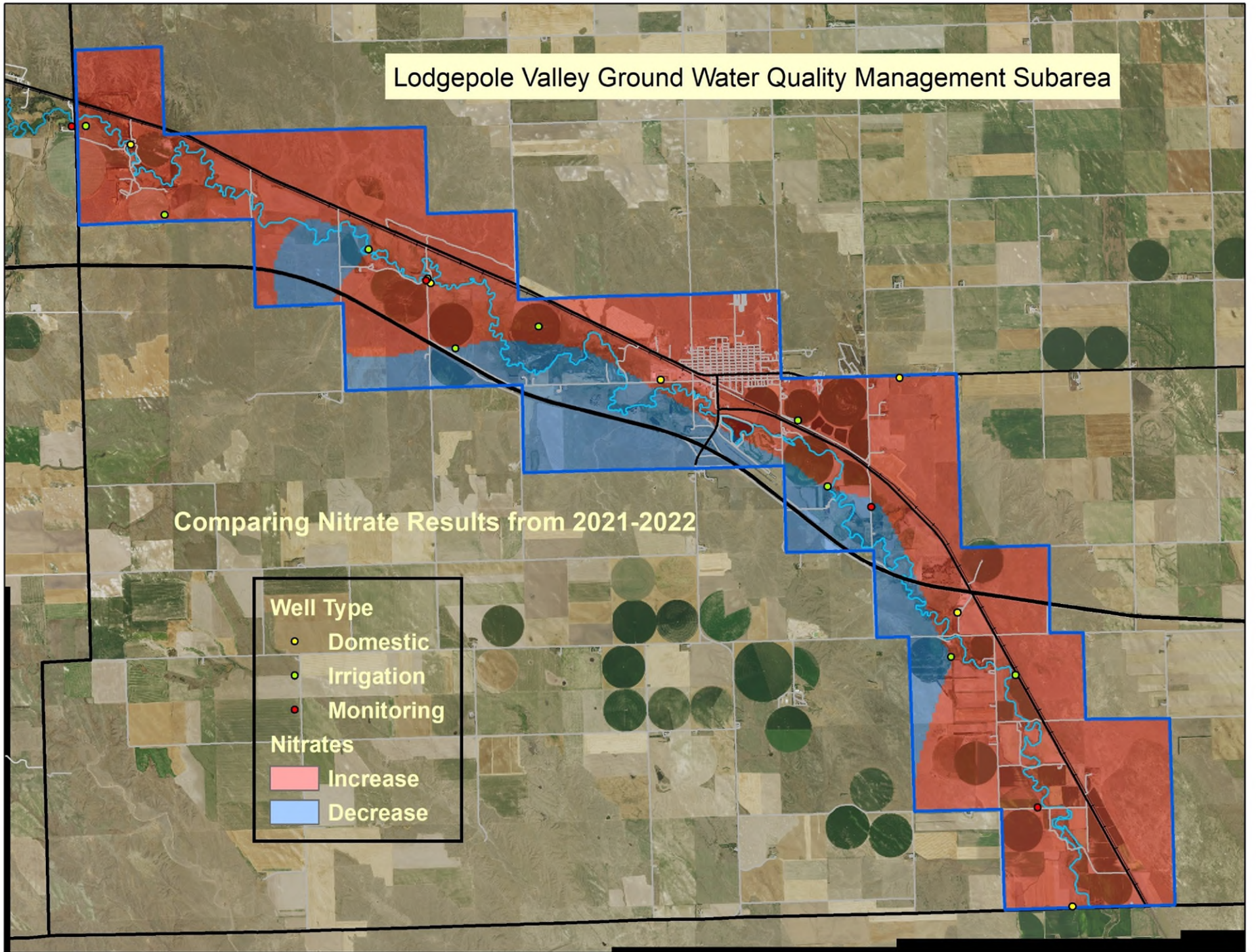
## Comparing Nitrate Results from 2021-2022

**Well Type**

- Domestic
- Irrigation
- Monitoring

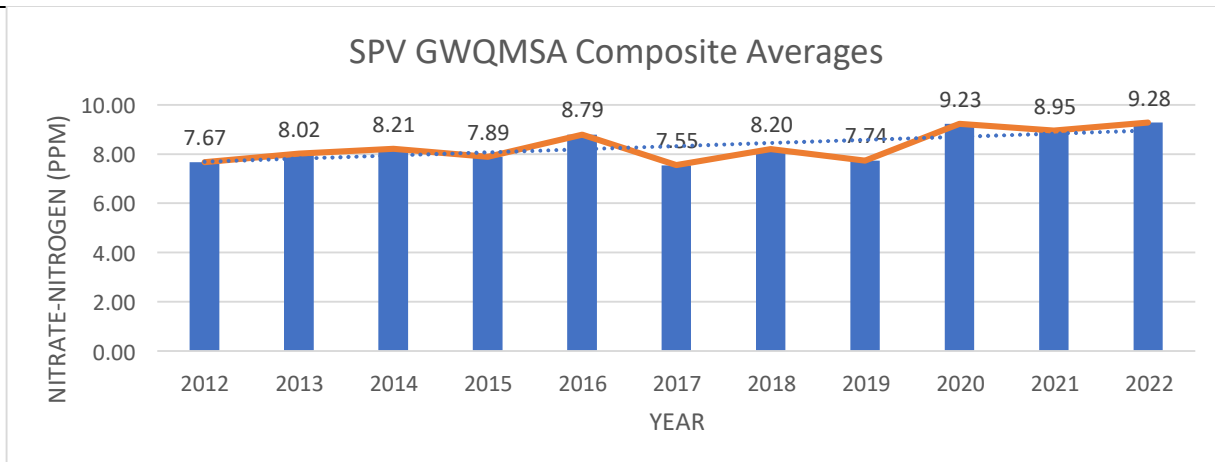
**Nitrates**

- Increase
- Decrease



### South Platte Valley Ground Water Quality Management Subarea

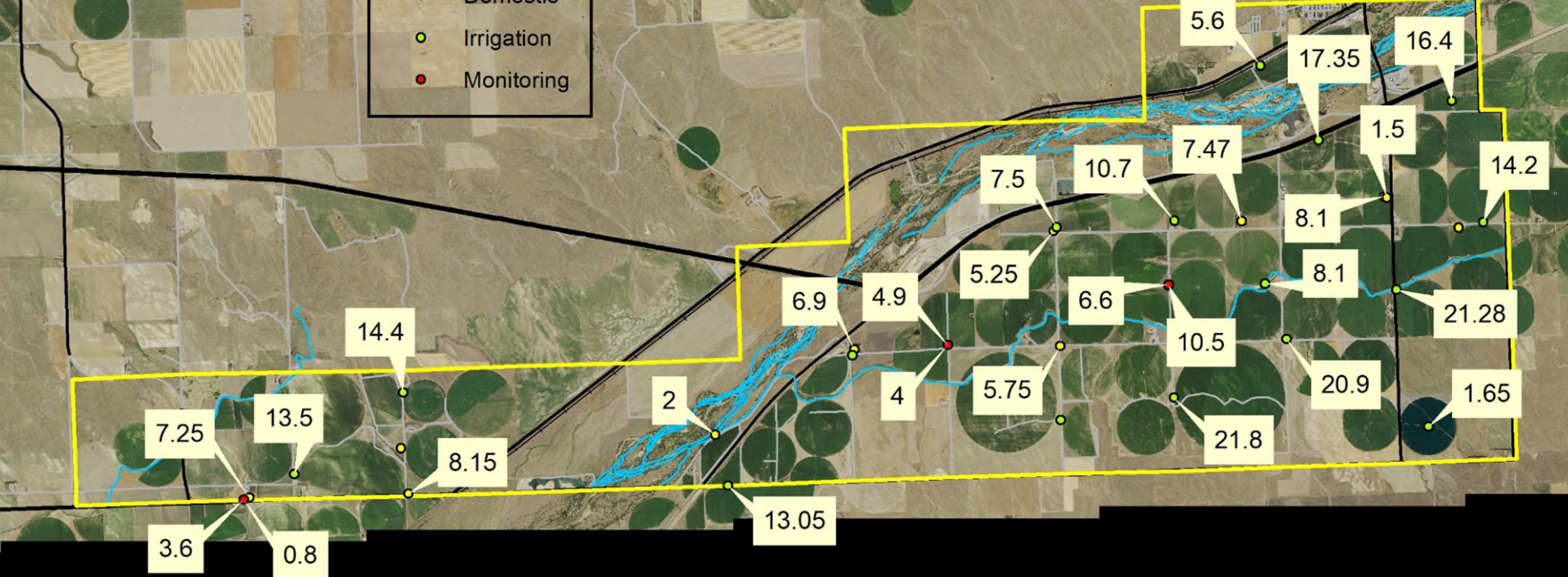
Well Type	Well ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Domestic	D078	4.40	4.20	4.20		3.80		5.80	4.50	5.13	5.80	6.90	
	D110	5.55	10.50	15.70	16.10	15.60	12.80	14.90	13.60	8.50	5.90	8.15	
	D077	4.10	5.10	4.60	5.95		4.70	4.85	4.35	5.40		5.25	
	D076	7.93	7.33	10.20	9.00	8.25	7.97	8.15	7.10	6.30	5.70	7.47	
	D109	4.57	9.65	1.63	2.15	5.50	5.25	3.50	2.10	7.75	4.20	7.25	
	D111												
	D075	14.10	9.25	9.60	7.40	5.40	6.70						
	D100							10.60	1.30	7.80			8.10
	D074	1.30	4.70	1.30	1.15	5.30	2.10	1.15	1.10	1.35	1.25	1.50	
	D113	5.07	2.70	2.30	1.40	1.95	2.43	2.80	2.13	2.00	2.00	2.00	
D079	3.00	3.95	4.80	4.10	3.60	4.60	3.55	4.25	5.15	4.10	5.75		
Irrigation	I119	8.10	5.20	5.20	10.50	14.20	8.50	10.40	6.80	6.60	6.10	5.60	
	I139	8.00	8.10	11.90	12.70	13.90	8.40	11.30	10.50	10.20	7.90	7.50	
	I141	10.80	10.20	11.80	9.90	10.60	10.60	10.70	10.10	10.80	7.40	8.10	
	I144	1.50	1.35	1.20	1.40	1.20	1.20	0.90	1.10	1.70	1.20	1.65	
	I112	7.60		19.60	16.20	16.90	12.20	11.50	16.20	11.10	16.60	14.40	
	I143	20.00	19.80	18.90	17.70	20.55	16.90	20.40	17.70	23.70	20.60	21.28	
	I114	6.70	6.50	6.20	5.50	11.00	10.00	12.40	12.07	17.30	15.90	13.05	
	I115												
	I108	13.40	12.80	10.20	12.30		12.90	9.30	10.70	10.40	11.10	13.50	
	I116	12.00				4.00	3.00	4.50	3.60	10.40	14.20		
	I159	19.60	16.10	15.70	11.30	14.00	8.90	11.20	10.90	13.60	12.10	14.20	
	I142	14.40	18.60	19.70	15.40	20.00	15.70	17.70	16.50	18.50	18.80	20.90	
	I118	6.50	7.50	5.40	5.20	7.20	6.40	6.20	10.80	15.30		16.40	
	I138	7.90	6.80	6.40	6.20	8.60	7.90	9.50	10.20	9.10	10.20	10.70	
	I137	8.80	10.90	8.80	9.30	11.10	10.60	12.30	12.40	16.80	16.80	17.35	
I145	6.40		10.90	11.60	17.00	15.70	19.40	18.70	22.90	21.60	21.80		
Monitoring	D-3-M	8.70	10.40	10.42	9.40	7.60	5.70	5.10	5.10	7.80	10.90	10.50	
	D-3-S	7.65	8.05	7.90	4.60	3.50	3.20	4.20	5.90	6.50	7.20	6.60	
	D-4-M	3.70	4.25	3.80	6.60	6.50	5.20	6.40	6.10	5.90	6.90	4.90	
	D-4-S	1.79	3.05	2.80	5.20	3.80	6.20	3.50	3.10	4.30	2.80	4.00	
	D-5-M	3.65	7.10	4.90	1.55	3.90	1.90	2.80	2.50	3.40	3.70	3.60	
	D-5-S	2.95	2.55	2.11	1.05	1.20	1.20	0.90	0.80	1.30	0.80	0.80	
<b>Average</b>		<b>7.67</b>	<b>8.02</b>	<b>8.21</b>	<b>7.89</b>	<b>8.79</b>	<b>7.55</b>	<b>8.20</b>	<b>7.74</b>	<b>9.23</b>	<b>8.95</b>	<b>9.28</b>	



# South Platte Valley Ground Water Quality Management Subarea

**Well Type**

- Domestic
- Irrigation
- Monitoring



# South Platte Valley Ground Water Quality Management Subarea

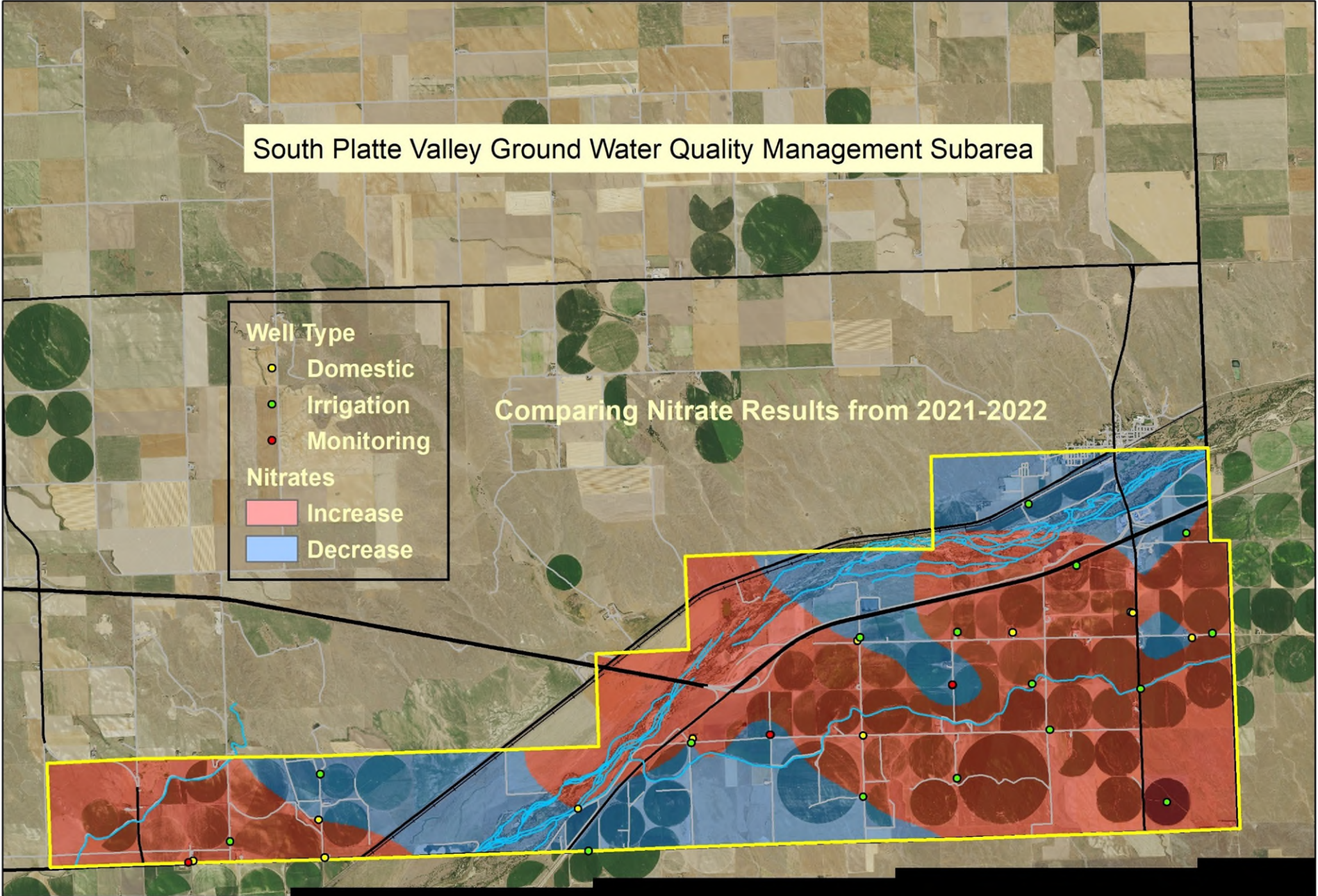
## Comparing Nitrate Results from 2021-2022

**Well Type**

- Domestic
- Irrigation
- Monitoring

**Nitrates**

- Increase
- Decrease



### Deuel County Tablelands

Well Type	Well ID	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Domestic	D106	2.95	2.65	2.70	2.30	2.50	3.30	2.80	2.30	2.80	2.00	2.85
	D155				6.90	10.40	10.70	9.30	10.50	15.30	6.30	
	D095				6.35	6.30	7.50	7.85	6.90	8.00	7.10	
	D107	2.95	2.67	3.00	2.65	2.50	3.00	2.75	2.45	2.45	2.50	3.10
Irrigation	I120	9.80		8.00		3.60					3.80	4.45
	I102		2.00	1.80	1.75	2.00	1.90	1.70	2.50	2.00	2.05	2.27
	I072	3.00	2.60	2.90	2.80	2.90			1.80	2.70	3.20	3.25
<b>Average</b>		<b>4.68</b>	<b>2.48</b>	<b>3.68</b>	<b>3.79</b>	<b>4.31</b>	<b>5.28</b>	<b>4.88</b>	<b>4.41</b>	<b>5.54</b>	<b>3.85</b>	<b>3.18</b>