



**2022 Annual Voluntary Integrated Management Plan (VIMP)
Report**

Reporting on 2022 Data and Activities

Middle Niobrara Natural Resources District

April 10th, 2023



Purpose

The Middle Niobrara Natural Resources District (MNNRD or District) and the Nebraska Department of Natural Resources (NeDNR or Department) jointly adopted a Voluntary Integrated Management Plan (VIMP) which became effective on December 30, 2020.

Annual reports for the Voluntary IMP are intended to provide transparency between the MNNRD and NeDNR, and to keep the public informed about integrated water management activities within the District. This annual report covers the actions and progress made by the MNNRD in 2022 to implement voluntary IMP items with a focus on groundwater quantity.

MNNRD Reporting Responsibilities

The VIMP requires that the MNNRD annually reports on the following ground water data collected by the District:

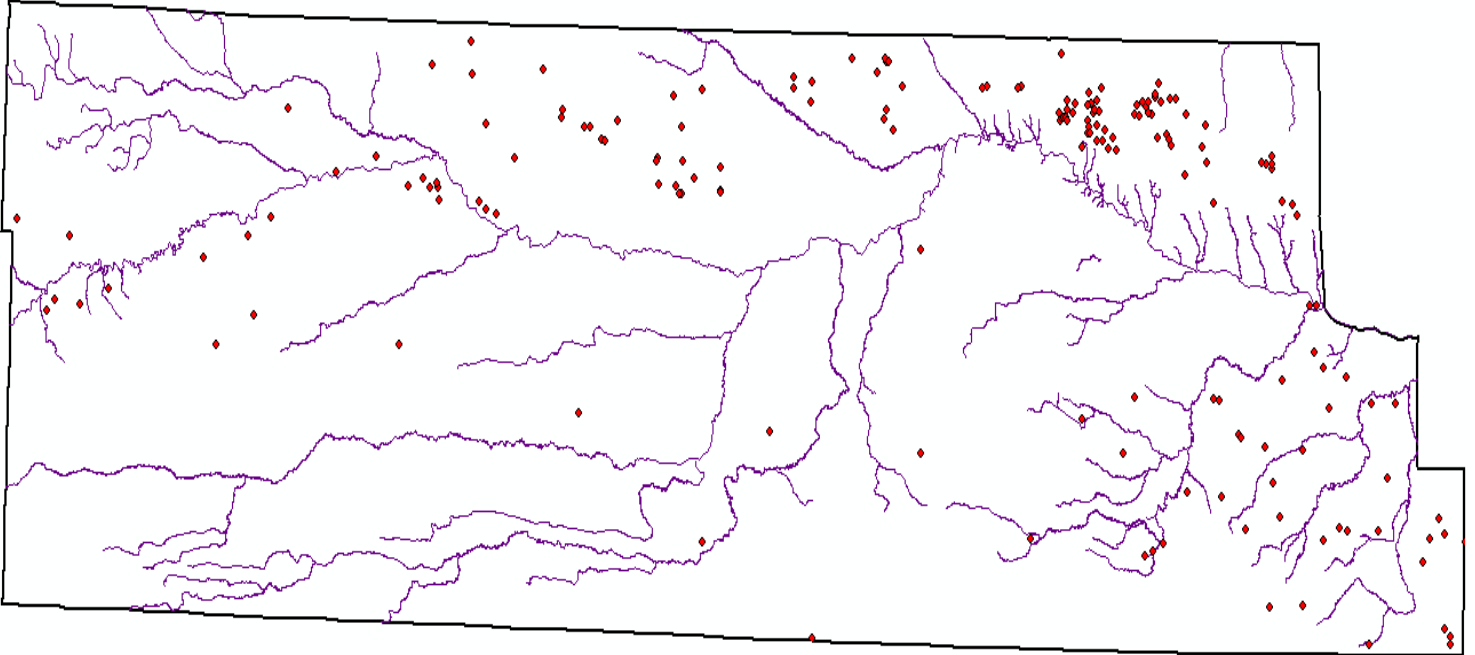
1. Static groundwater level measurements.
2. Certification of groundwater uses and any changes to these certifications.
3. Information gathered through the municipal and non-municipal industrial accounting process.
4. Irrigation water use data collected by the District, such as from metered high capacity well flow data.
5. Stream gage measurements on District-sponsored gages.
6. Water well construction permits issued and denied and any conditions associated with the permits issued.
7. Any variances issued, including the purpose, location, any required offset, the length of time for which the variance is applicable, and the reasoning behind approval of the variance.
8. Approved transfers, including all of the information provided with the application and used in the approval of the transfer, the location of the land area or well that is being transferred, and the location of the land area or well that will replace the original relevant flow meter data collected.
9. Any retirements of irrigated acres or other activities by the District for the purpose of mitigating depletions.
10. Information related to any water banking transactions.
11. In keeping with Neb. Rev. Stat. §46-715(3) which requires the IMP to include procedures to track depletions and gains to streamflow's resulting from new, retired, or other changes to uses:
 - a. Geographic location of new water wells permitted

- b. Depletion calculated (and method of calculation) for each new water well permitted
- c. Estimated total consumptive use of each new water well permitted
- d. Retirements of agricultural, municipal, or industrial groundwater consumptive uses
- e. Information on any mitigation or new projects that have occurred, including geographic location, description of type and operations of the project, source water of the project, and calculated benefits associated with the project (if the project is groundwater augmentation, the report should include calculated accretions as well as the method/models used to estimated accretion values)
- f. Streamflow accretion activities
- g. Water banking activities
- h. District regulations/management activities (designated groundwater management areas, use restrictions, etc.)
- i. New depletions accounting report
- j. New data collected or model/study results (conservation measures, riparian ET, etc.).
- k. Offsets provided for depletions resulting from increased consumptive use related to the above-listed items. This includes reporting on offsets and mitigation activities for the purpose of addressing new depletive water uses. Such activities to be reported include canal diversions for the purpose of groundwater recharge, operation of stream augmentation projects, conjunctive management, and irrigated acre retirements.

1. Static Groundwater Level Measurements

The Middle Niobrara NRD collects static groundwater level measurements at 184 sites across the district semi-annually. Measurements are collected prior to irrigation in late March and early April, and again after the irrigation season in late October and early November. These timeframes allow the District to see the full effects of the drawdown from the irrigation season and the subsequent recharge. These 184 sites consist of 74 dedicated monitoring wells and 110 irrigation wells. Total sampling sites have increased dramatically since 2011 when the Board of Directors required all new irrigated acres to be sampled for groundwater quality and quantity. The District added 14 more dedicated monitoring wells in 7 different locations in 2021/2022. Locations have dedicated data loggers/pressure transducers in one or more of the wells on site. These data loggers take a water level measurement, once a day, every day of the year. This data is a valuable addition to regular static water level data.

MNNRD Water Quantity Sampling Sites



2022 saw some of the lowest precipitation totals across the district in the last 20 years and turned the tide of the ever-increasing high water tables. Irrigation and water use was well above average with most row crop producers using 2–5-acre inches more than they do in dry years. Combine those factors together and you see the MNNRD groundwater levels come off their record highs and start to trend downward. While levels have come down a little, the MNNRD is still seeing flooded meadows, damaged county roads, and full ditches in many portions of the District. A near record winter in terms of snowfall during the winter of 2022-2023 should provide a substantial recharge to the water table in the future. The District still currently maintains an average of almost 2' above 1998 levels.

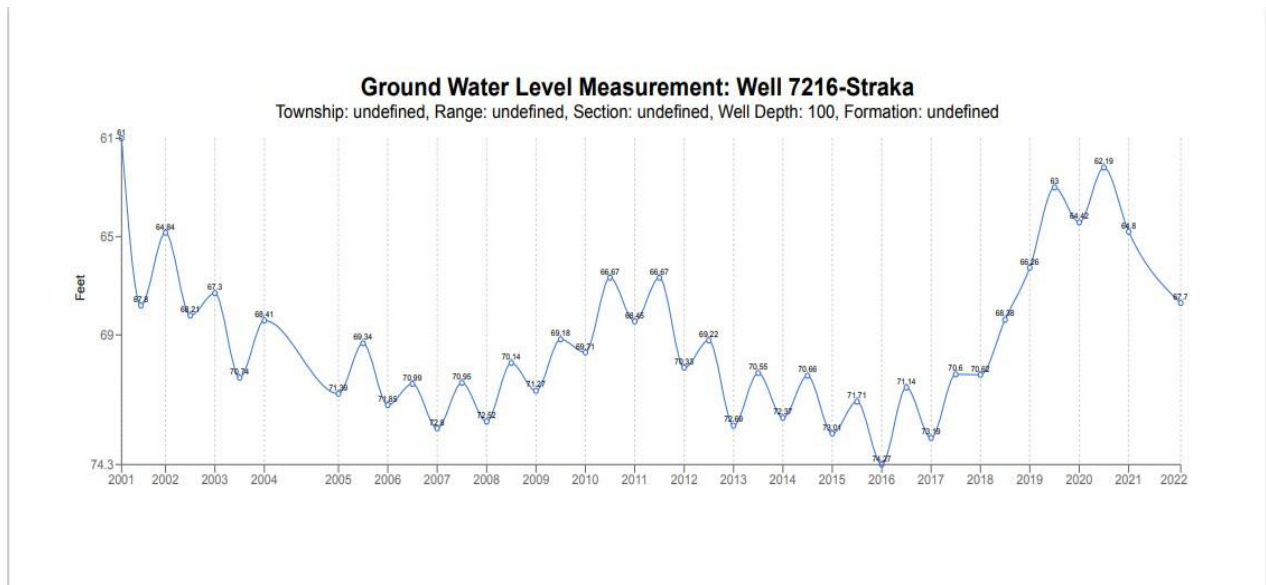
The graph located below shows the changes in measurements from the fall of 2022, relative to the measurements from the fall of 2021. Included in the graph is the highest and lowest changes measured since the fall of 2021 as well as the average change and the percentage of sampled wells showing an increase. Tables are sorted by county, and the District average as a whole.

Fall 2022 Static Water Levels Compared to Fall 2021 Static Water Levels

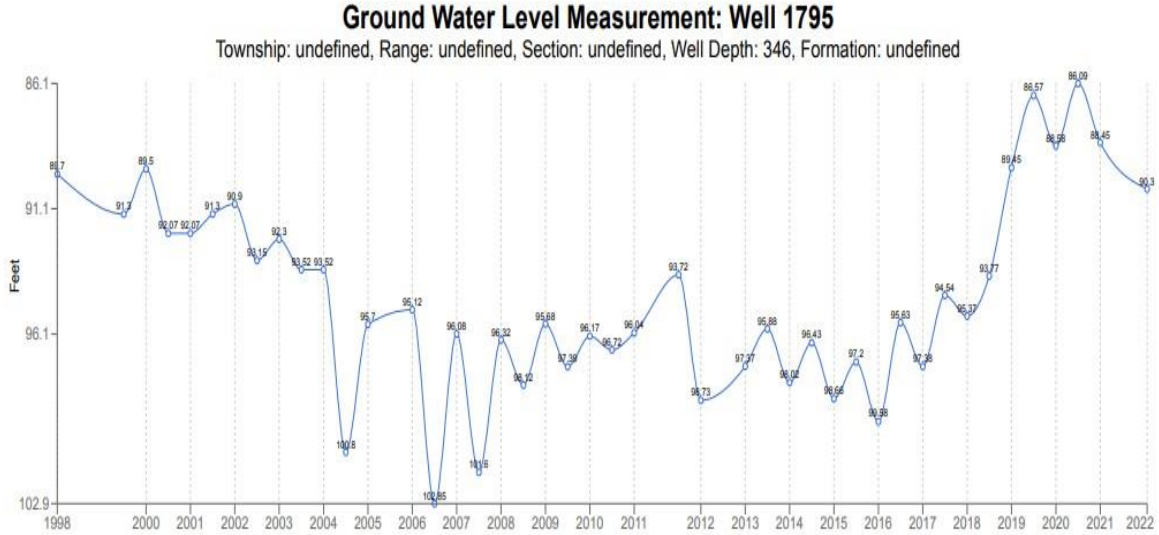
	Cherry	Brown	Rock	Keya Paha	MNNRD District
Lowest Change Since Fall 2021	-3.75'	-6.05'	-4.04'	-7.28	
Highest Change Since Fall 2021	3.80'	1.43'	-.088'	2.67'	
Average Change Since Fall 2021	-1.05'	-1.92'	-2.99'	-3.37'	-2.33'
% Of Sampled Wells Showing an Increase Since Fall of 2021	17%	5%	0%	6%	7%

One Representative Static Groundwater Level Graph from each county in the MNNRD

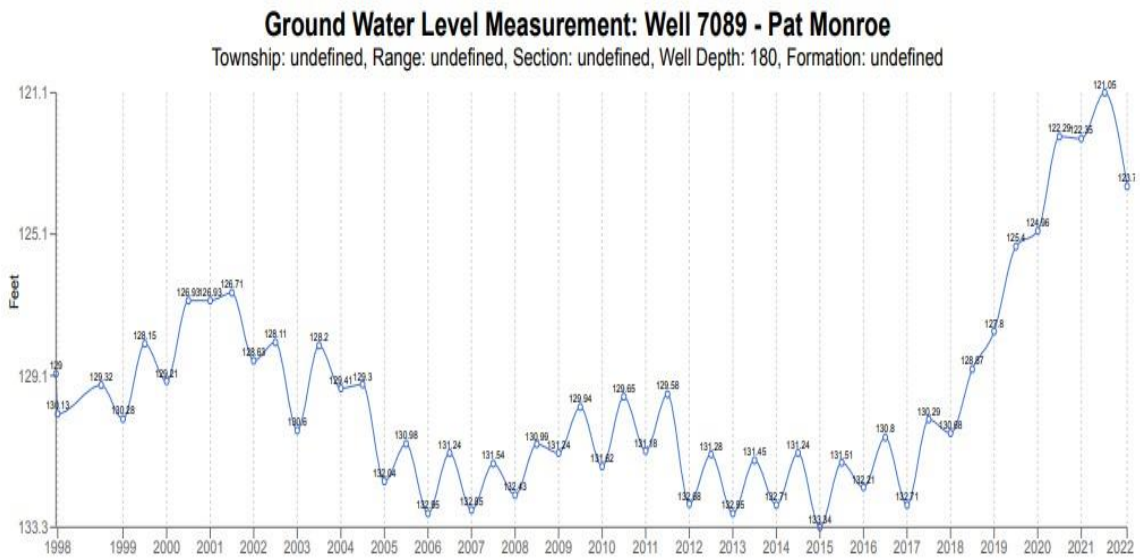
Data From One Location that is a Representative Graph of Western Rock County Static Water Levels



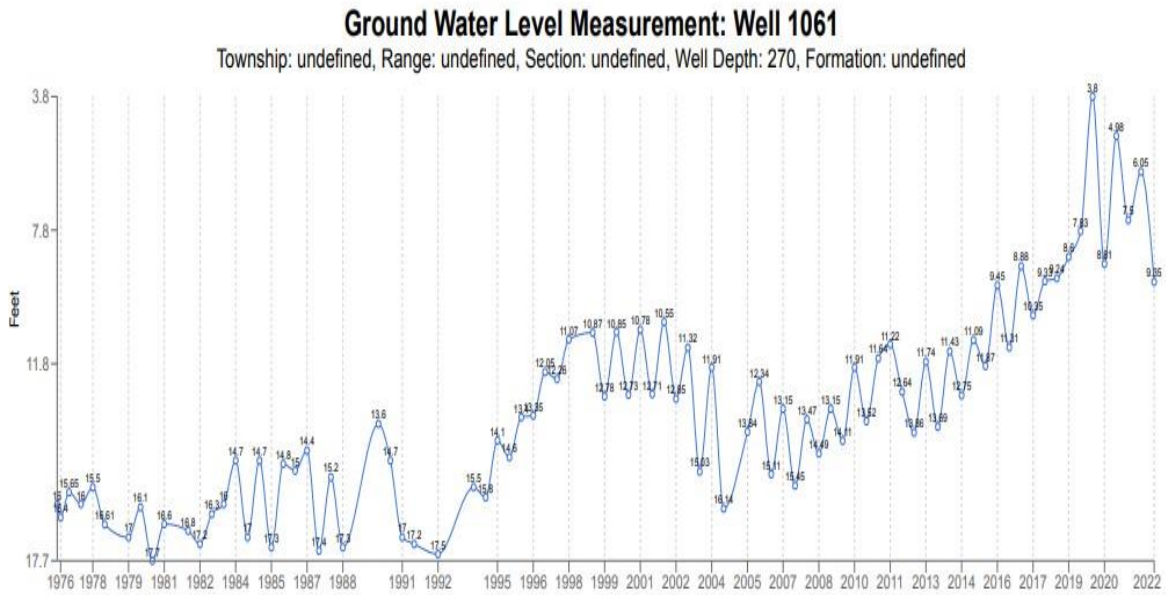
Data From One Location that is a Representative Graph of **Brown County** Static Water Levels



Data From One Location that is a Representative Graph of **Keya Paha County** Static Water Levels



*Data From One location that is a Representative Graph of **Cherry County** Static Water Levels*



2. Certification of new groundwater uses and any changes to these certifications.

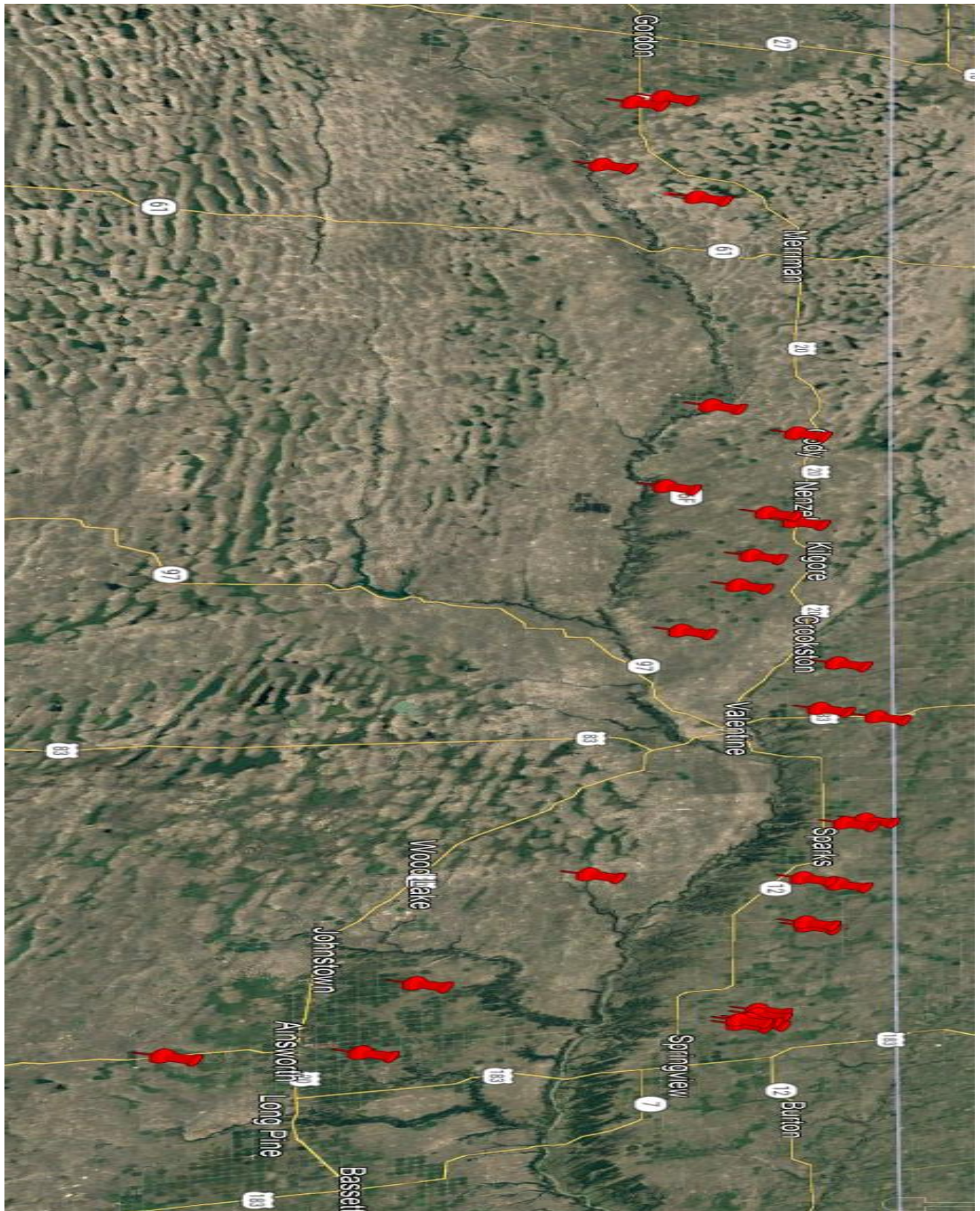
In 2022 the MNNRD Board of Directors approved rule changes that allowed for the development for up to 3,000 acres of new groundwater use. There were 32 applications for 3,452 irrigated acres, and the Board approved 28 applications for a total of 2,999 new irrigated acres across the district. The location and acres of the approved certifications are as follows:

<u>Location</u>	<u>Acres Approved for Certification</u>
SW 8-34-24	135
W ½ 19-34-23	46
E ½ 24-34-24	46
NW 34-29-22	42
NW 7-33-30	150
SE 10-34-29	32
SW 34-30-23	150
NE 14-30-22	143
SW 1-33-22	135
W ½ 2-33-22	135

NE 12-33-22	135
NE 1-33-22	135
NW 12-33-22	135
NE 2-33-22	135
NW 32-33-40	145
SW 34-34-32	135
SW 16-33-34	80
SW 15-34-28	130
NE 5-33-31	132
NW 25-34-34	12
SW & NW 15/22-32-25	102
SE 3-34-28	100
NW 8-32-40	120
NW 1-34-26	136
NE 12-34-36	150
W ½ 20-33-38	63
SW 30-33-32	25
SW 19-34-24	120
Total	<u>2,999</u>

The MNNRD continues to update landowner and groundwater certification changes as they are available.

Map of New Irrigated Acres



3. Information gathered through the municipal and non-municipal industrial accounting process.

The Middle Niobrara NRD collects consumptive use data from the local municipalities on a yearly basis. The municipalities below have reported data to the MNNRD. The 5-year average yearly use in millions of gallons for each city or village is found below.

<u>City / Village</u>	<u>Average Consumptive Use (Millions of Gallons)</u>
City of Valentine	300.90
City of Ainsworth	141.40
Village of Woodlake	12.87
Village of Crookston	4.97
Village of Kilgore	4.75
Village of Merriman	18.40
Village of Cody	5.9
City of Long Pine	27.07

4. Irrigation water use data collected by the District.

Middle Niobrara NRD staff, on semiannual basis, reads and collects data on 95 flow meters in the district. The board of directors voted to require flow meters on all new irrigation wells drilled after 2011, but do not require an irrigation allotment or consumptive use cap. Staff collects data on these mandatory meters, as well as a handful flow meters that landowners have voluntarily installed and given permission for the MNNRD to utilize. Landowners in Management Zone 3 are required to report estimated water use in their yearly fertilizer report forms, which usually comes in the form of engine hours, electric bills, or soil moisture sensing equipment. Per county averages in **Acre Inches** for 2021 are as follows:

<u>County</u>	<u>Average Acre Inches</u>
Cherry County	17.1" (15.59" in 2021)
Keya Paha County	17.4" (16.27 in 2021)
Brown County	17.8" (15.7" in 2021)
Rock County	14.9" (13.5" in 2021)

5. Stream gage measurements on District-sponsored gages.

The Middle Niobrara NRD does not currently sponsor any stream gage measuring equipment.

The Niobrara River Basin Alliance(NRBA) will be involved in the deployment of a stream gage on the Niobrara in coordination with the orders provided by Department of Natural Resources during the purchase of the Water Rights associated with NPPDs Hydro-facility. Data from that gage will be provided after installation.

6. Water well construction permits issued or denied and any conditions associated with the permits issued.

In 2022, the Middle Niobrara approved 33 high capacity well construction permits. Out of the 33 permits issued, 6 of the permits were replacement well permits for existing irrigation wells and 27 were permits for a new irrigation wells. Permits for new irrigation wells were approved through the new irrigated acre process, transfers, or variance requests.

There are 14 conditions and restrictions in place during the process of an *Application For A Permit To Construct A Water Well In The MNNRD*. At their discretion, the Board of Directors may apply any other conditions to the permit application. Past examples include limits on total GPM pumped, location of the replacement well, water use efficiency conditions, and cleaning up the mapping of the actual irrigated acres vs acres that were certified.

7. Variances

There were 2 variances applied for and granted by the MNNRD Board in 2022. Both variance requests were to relinquish existing surface water appropriations in exchange for groundwater certifications and irrigation wells. The variance request for Keya Paha County resulted in 7 new irrigated acres, and the variance request in Cherry County was only a change in water source.

<u>¼</u>	<u>Sec.</u>	<u>Township</u>	<u>Range</u>	<u>County</u>	<u>Reason for Application</u>
NW ¼	12	32	22	Keya Paha	Surface to Groundwater Source
NW ¼	19	33	33	Cherry	Surface to Groundwater Source

8. Certified Irrigated Acre Transfers

Information on Transfer Applications include Landowner Requesting and Providing the transfers, legal description, total acres being transferred, and well registration numbers if applicable. After receiving the application, MNNRD staff add the following information from both locations to the application:

Stream Depletion (SDF)

Slope and Erosion Issues

Title Report (Free and Clear Titles)

Static Water levels

Nature and purpose of the Transfer

After review of the application the Board of Directors consider all factors and decide to approve, approve with conditions, or deny the application.

There were 14 certified irrigated acre transfer applications reviewed and approved by the Board of Directors in 2022. There was one transfer denied by the Board in 2022 due to the nature of the transfer.

<u>Location Providing Transfer</u>	<u>Acres</u>	<u>SDF</u>	<u>Location Receiving Transfer</u>	<u>Acres</u>	<u>SDF</u>
NE 22-32-34	120	50%	SE 15-34-28	120	35.5%
NE 34-32-34	157	46%	NW 15-34-28	157	35.5%
NW 27-32-21	129.6	92%	SW 25-33-37	129.6	48.6%
C 35-32-38	14.25	31%	W1/2 2-33-22	14.25	10%
C 35-32-38	14.25	31%	SW 2-33-22	14.25	10%
C 35-32-38	14.25	31%	NW 1-33-22	14.25	10%
C 35-32-38	14.25	31%	NW 12-33-22	14.25	10%

C 35-32-38	14.25	31%	SW 1-33-22	14.25	10%
C 35-32-38	14.25	31%	NE 2-33-22	14.25	10%
C 35-32-38	14.25	31%	SE 1-33-22	14.25	10%
C 35-32-38	14.25	31%	NE 1-33-22	14.25	10%
NW 34-29-22	41	22%	SE 35-29-22	41	22%
SE 10-34-29	32	48%	SE 1-33-22	32	9%

Retirements of irrigated aces or other activities by the District for the purpose of mitigating depletions.

The Middle Niobrara continues to be heavily involved in the Niobrara River Basin Alliance’s purchase of the water rights associated with NPPDs Hydro Facility. These water rights will be administered to help mitigate depletions within the bounds of the Middle Niobrara NRD. Orders from NeDNR were released in October of 2022 and the process will finalize in the first half of 2023.

The Ainsworth Irrigation District (AID) and the District continue to work together on potential projects that can reduce the amount of water going through the AID canal system that isn’t being used for its intended purposes. These projects can help keep water in the Snake River and bound for the Niobrara. Canal water turnouts directly damage streams, streambanks, and streambeds in Brown County and have created an artificial water mound in portions of Brown and Eastern Cherry Counties.

District staff and Board of Directors continue to encourage landowners to apply for a variance to relinquish surface water rights and uses in exchange for groundwater uses. These exchanges have immediate impacts to stream depletions and can be beneficial to all parties involved.

9. Water Banking

MNNRD Board and Staff are currently working on redeveloping a water bank for District uses. The MNNRD started accepting Certified Acre transfer applications in 2008 when the District finished its irrigated acre certification process. Any transferring of irrigated acre rights from a low to a higher stream depletion (SDF) requires an acre offset. Acres transferred from a higher SDF to a lower SDF are only allowed at a 1:1 ratio, with the MNNRD banking the remaining difference. Landowners are also encouraged by the MNNRD to transition their surface water irrigation to groundwater irrigation as these scenarios always result in a reduction in SDF. As a result of the 64 transfers since 2008, the MNNRD has banked a total of **1,899.23** groundwater-irrigated acres.

Conclusion

The Middle Niobrara NRD looks forward to continuing the partnership with the Nebraska Department of Natural Resources in maintaining and enhancing our water resources throughout the District. This yearly report is a great opportunity to evaluate all of the surface and groundwater controls in place as well as preserving a positive, open line of communication between all parties. Staff and the Board of Directors will continue to take a progressive approach to ensuring ample water quantity for all users for today, tomorrow, and the future.



Middle Niobrara NRD