

NORTH PLAINS GROUNDWATER



CONSERVATION DISTRICT

2020 ANNUAL REPORT







MISSION STATEMENT

Maintaining our way of life through the conservation, protection and preservation of our groundwater resources

Location and Extent

The District covers approximately 7400 square miles in the northern Texas Panhandle encompassing Dallam, Hansford, Lipscomb, Ochiltree, and Sherman Counties, as well as parts of Hartley, Hutchinson, and Moore Counties. The District is home to approximately one million acres of irrigated agricultural land.

BOARD OF DIRECTORS



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2020 PRESIDENT'S ADDRESS



*Bob Zimmer, President
Board of Directors*

Clearly, 2020 was a year like no other for all of us. In at least one way; however, it found the people of the planet doing what we have done to survive since the beginning of time. It challenged us in ways most of us have never considered and required that we pull together to find solutions. Like most other organizations, the North Plains Groundwater Conservation District (the District) recognized the unprecedented times, focused on the reason we are here, and went about fulfilling the mission:

“Maintaining our way of life through conservation, protection and preservation of our groundwater resources.”

The year 2020 marked the 65th anniversary of the District, so we celebrated the awesome opportunity we’ve had to contribute to a better future for the people of the northern Panhandle. I am humbled and honored to have participated in this work for 18 of those 65 years and by serving now as President of the Board of Directors.

While the pandemic did sometimes change the process, the District was able to ultimately accomplish many of its core functions. One of those was gathering 2019 groundwater production data. Since you must measure what you want to manage, tracking groundwater production is one of the most important initiatives of the District. To make the process safer, staff reduced close contact during reporting season by limiting in-office visits, while assisting producers with filing their 2019 production reports via regular and electronic mail.

2019 production totaled approximately 1.4 million acre-feet. While certainly a significant amount of pumping, this level did not trigger the need for reduced annual allowable production limits for the District. The District rules include a process that compares reported annual production with computer models provided by the Texas Water Development Board that project the District’s Desired Future Conditions. If production exceeds the model for 3 consecutive years, adjustments in the annual allowable may be triggered to ensure the District meets the Desired Future Conditions approved by stakeholders. The main take-away here is that your conservation and efficiency efforts have allowed the District to stay in line with your conservation goals without the need for additional reductions.

With public safety always a top priority, the District focused in 2020 on an effort to secure open wells throughout the District. Open wells that are not equipped for pumping or properly covered are dangerous for people, livestock and wildlife, and also increase the risk of direct contamination of the aquifer. The process involved the verification of approximately 1600 wells identified as capped according to District records. If the wells were found to be not secured, staff worked with well owners to bring the wells into compliance. Another aspect of the program is ongoing identification of additional unsecured wells that are not included in the District’s computer system. The staff follows the same procedure to work with stakeholders to secure these wells and make our District a safer place for all of us. The effort is not possible without your cooperation, and I want to thank all of the District stakeholders for your partnership in this important project.

Finally, I want to point out that 2020 saw a record number of wells drilled within the District boundaries-- approximately 384 new production wells. There are many reasons for this increase including reduced productivity of some wells and increases in the productivity of the District’s

agricultural sector. With agriculture being one of the main economic drivers in this area, this growth is good news! As a conservation district board president, the best news to me is that this growth is happening while we are staying on track to reach our conservation goals.

I have been involved in some capacity with the North Plains Groundwater Conservation District for over 20 years. I do this because I feel that groundwater in the northern Panhandle is the one thing that can, and will, have the greatest impact on the quality of life in this land that is my home. However, my experience with the process has also shown me that this Board of Directors, no matter how committed and innovative they are, will not be able to make the necessary changes without buy-in from the stakeholders. What you do has made the difference. Your willingness and drive to be the best stewards you can be, have made it possible for us, as a community, to move toward a brighter future!

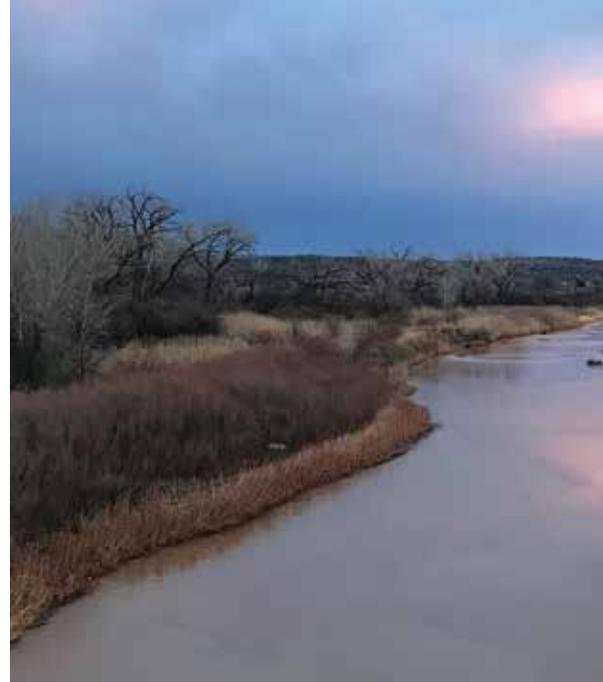
Now, the rest of the story. If you are doing all you can to improve, keep doing what you are doing. This is no time to relax. WE cannot grow weary in doing the right things. If you are an irrigator and have not participated in the District's Master Irrigator program, sign-up for the 2022 Class. If Master Irrigator is not what you need, find the information you need to be better, and apply it to your operation.

The Ogallala aquifer is a limited, diminishing resource. There will be more changes and adjustments necessary if we are to attain a truly sustainable economy and a sustainable quality of life in the northern Panhandle. Like we were in 2020, in the future we may be challenged in some ways we had not considered. Nevertheless, I am confident we will pull together again to find solutions.

Sincerely,



Bob Zimmer
Director, Hansford and Hutchinson Counties,
North Plains Groundwater Conservation District
President 2020-2022



MANAGEMENT GOALS

A. Providing for the Most Efficient Use of Groundwater

1. Groundwater Reporting

Management Objective:

Monitor total annual groundwater withdrawals through water use reporting by all producing groundwater right owners that have a well capable of producing more than 25,000 gallons of groundwater a day.

Performance Standards:

Annually, the District will collect production reports on all properties containing non-exempt wells and calculate annual groundwater withdrawals for the District.

Action Taken:

The District received production reports for 2019 from 2900 Groundwater Production Units. Annual groundwater withdrawals were calculated and published in the Hydrologic Report and presented to the Board at the June 2020 board meeting.

Table 1: Groundwater production reported to the District, 2015-2019

County	2015	2016	2017	2018	2019 ^[A]	Average ^[B]
Dallam	297,000	339,200	312,300	349,900	303,200	320,300
Hartley	332,700	391,600	376,000	422,600	349,200	374,400
Moore	156,700	185,700	173,100	200,600	157,700	174,800
Sherman	251,700	285,300	265,100	312,000	255,400	273,900
Hansford	148,800	170,400	146,700	190,800	162,300	163,800
Hutchinson	57,700	67,700	63,600	75,500	68,400	66,600
Lipscomb	39,400	42,300	44,200	44,200	43,400	42,700
Ochiltree	77,400	81,400	77,300	95,500	81,800	82,700
West	1,038,100	1,201,800	1,126,500	1,285,100	1,065,500	1,143,400
East	323,300	361,800	331,800	406,000	355,900	355,800
Total	1,361,400	1,563,600	1,458,300	1,691,100	1,421,400	1,499,200

[A] 2019 Production data are provisional and subject to minor changes.

[B] Average is an average of the last five years.

2. Well Registrations and Permitting

Management Objective:

All exempt and non-exempt wells constructed within the jurisdiction of the District are required to be registered or permitted in accordance to the District's Rules.

Performance Standards:

District staff will verify all wells within a Groundwater Production Unit(s) are registered or permitted in accordance with the District Rules during any site visits.

Action Taken:

In 2020, the District inspected all Groundwater Production Units (GPUs) on which applications were made for new permits for non-exempt wells, new exempt wells were registered, and previously unregistered wells were discovered during inspections. The following table gives the results from permitting and inspecting wells in 2020.

Table 2: Permitting and Inspecting wells

Permitting and Inspecting Wells		
Non-exempt Permits	GPU's Inspected	New Exempt Wells Registered
384	1111	116

3. Conservation Demonstration and Education

Management Objective:

Provide support through the District's North Plains Water Conservation Center, demonstrations, and other District education programs to promote groundwater conservation.

Performance Standards:

At least annually, conduct field days and/or other events to educate stakeholders regarding water use efficiency technologies and practices. The District will publish reports on the activities at the North Plains Water Conservation Center and other demonstrations and education programs.

Action Taken:

Dupont Pioneer Crop Production Clinics

In January of 2020, the District co-sponsored a series of four Texas Panhandle Crop Production Clinics presented by DuPont Pioneer. The meetings took place in Dalhart on January 13, Dumas on January 14, Stratford on January 15, and Spearman on January 16. Nich Kenny, Irrigation Engineer, presented findings from the 2019 on-farm demonstrations performed at the North Plains Water Conservation Center (WCC) at Etter. Steve Amosson, retired Texas A&M Economist, promoted the District's award-winning Master Irrigator program and Kirk Welch, Assistant General Manager – Conservation Outreach, informed attendees about production reporting deadlines, cost-share programs and other relevant District information.

The Master Irrigator Program

The Master Irrigator is a 4-day interactive training program combining lecture and producer panel interaction to provide a fast track to adoption of irrigation conservation practices, tools and technologies. Ultimately the program helps growers be more efficient stewards of the area's groundwater resources.

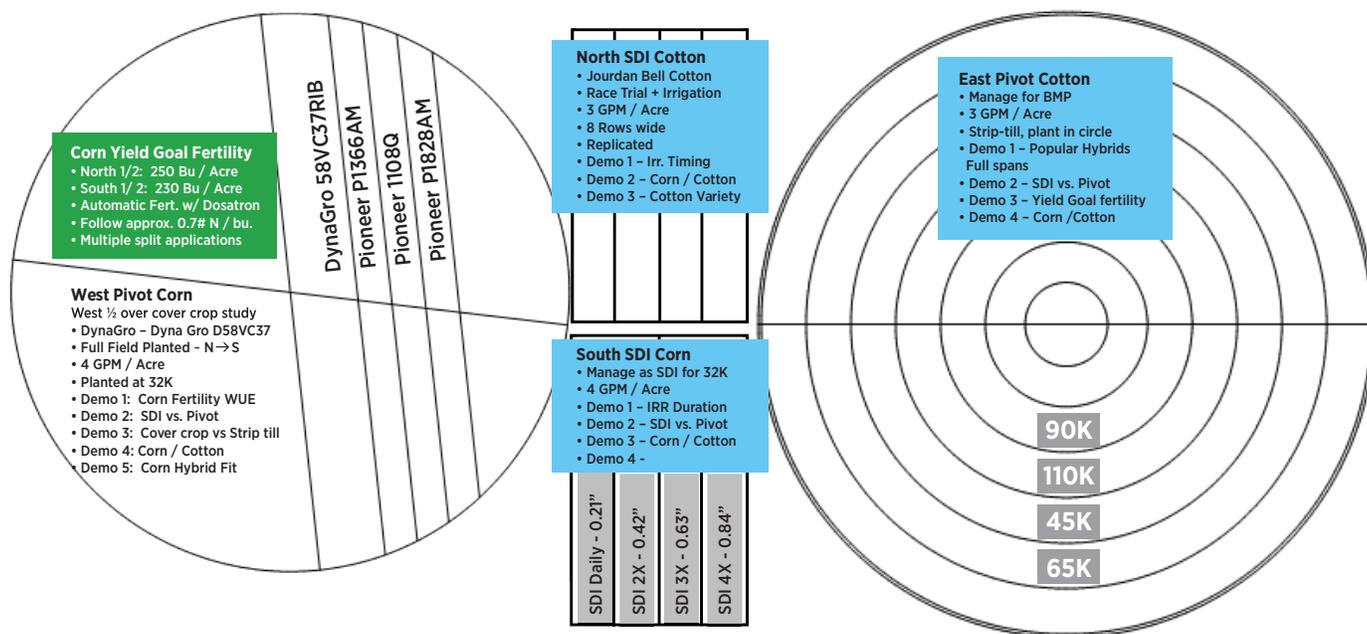
The fifth year of the Master Irrigator Program was cancelled due to health and safety considerations relating to the pandemic.

NPGCD Water Conservation Center – 2020 Annual Summary

by Nicholas Kenny, PE

The focus of the demonstration efforts at the Water Conservation Center during 2020 centered on improving irrigation and management strategies in a corn and cotton rotation. The WCC fills the District’s mission of conserving, protecting and preserving the Ogallala aquifer and other water resources in the northern Texas Panhandle by developing and demonstrating highly effective farming practices that can be rapidly adopted on large-scale farming operations.

Figure 1: 2020 WCC Field Plan for Corn and Cotton Rotation



The 2020 demonstration program at the WCC built upon the continuity of projects from previous seasons and allowed for new observations to prevail. The following is a summary of the unique observations found during the 2020 season.

1. Corn and Cotton Soil Water Extraction: A long-term question has been the soil water balance between corn (which leaves a large portion of water behind in the soil) and cotton (which is known to “mine” water from the soil). The thought is that cotton uses much less water than corn because much less irrigation water can be applied to create a profitable crop.

A complete two-year cycle of the corn and cotton rotation was completed in 2020 and the soil water extraction was properly measured using gravimetric sampling to 8 feet deep. The finding is that cotton approximately extracts the difference in the irrigation application compared to corn. The benefit in this scenario is that corn and cotton appear to be very symbiotic and significant long-term water savings can be experienced, so long as off-season precipitation is adequate to partially refill the soil profile following a cotton crop in preparation for the subsequent corn crop.

In essence, the cotton crop makes beneficial use of the water that corn leaves behind, water that otherwise would not be effectively translated into product or revenue.

2. Corn and Cotton Economics: The continuing challenge with many crop rotations is that often the primary crop is the economic driver and the rotational crop is a financial drag, tolerated for the benefit of soil health, pest control, etc. The findings at the WCC in 2020 further demonstrate that cotton and corn are essentially commensurate on the basis of Revenue / Acre-inch of water in a lower yield cotton season and both crops generate similar Revenue / Acre during regular seasons. The average Revenue / Acre-inch of water in 2020 was normally \$31.

Figure 2: 2020 WCC Water, Yield, and Revenue Summary

2020 Water (Inches)										
	Hybrid / Variety	Population	Yield	Irrigation	Rain	Soil (6ft.)	Total Water	Water Use Efficiency	Rev / Acre	Rev / Acre Inch
North Drip - Cotton Limited	RACE Trials	65K	2.29	7.54	12.58	4.18	24.30	47.2	\$671	\$28
North Drip - Cotton FULL	RACE Trials	65K	2.18	8.88	12.58	3.90	25.36	42.9	\$688	\$27
East Pivot - Cotton	Span 3 N - 90K	90K	2.76	7.30	12.58	4.78	24.66	56.0	\$852	\$35
East Pivot - Cotton	Span 4 N - 110K	110K	2.77	7.30	12.58	3.15	23.03	60.1	\$860	\$37
East Pivot - Cotton	Span 5 N - 45K	45K	2.30	7.30	12.58	3.74	23.62	48.7	\$665	\$28
East Pivot - Cotton	Span 6 N - 65K	65K	2.45	7.30	12.58	3.68	23.56	52.0	\$737	\$31
West Pivot - Corn	DynaGro 58VC37	32K	242.3	21.67	9.02	2.33	33.02	7.3	\$969	\$29
West Pivot - Corn	Pioneer 1366	32K	241.3	21.67	9.02	2.33	33.02	7.3	\$965	\$29
West Pivot - Corn	Pioneer 1108Q	32K	255.7	21.67	9.02	2.33	33.02	7.7	\$1,023	\$31
West Pivot - Corn	Pioneer 1828	32K	230.2	21.67	9.02	2.33	33.02	7.0	\$921	\$28
South Drip - Corn - 1X	DynaGro 58VC37	32K	248.2	16.84	9.02	3.29	29.15	8.5	\$993	\$34
South Drip - Corn - 2X	DynaGro 58VC37	32K	245.4	14.82	9.02	4.83	28.67	8.6	\$982	\$34
South Drip - Corn - 3X	DynaGro 58VC37	32K	243.8	17.69	9.02	3.68	30.39	8.0	\$975	\$32
South Drip - Corn - 4X	DynaGro 58VC37	32K	248.1	17.58	9.02	4.35	30.95	8.0	\$992	\$32

3. Subsurface Drip Irrigation (SDI) Strategies: SDI management in the grain corn crop was scheduled to simulate irrigation schedules of every day, every other day, every third day, and every fourth day, limited by 4 GPM / Acre capacity. The premise is that the same total volume of water was applied but the frequency of application was adjusted. The findings indicate that daily irrigation provided the best yield and water use efficiency, but not significantly higher than either of the other treatments. The irrigation event every four days best matched summer rainfall events and appeared to promote the healthiest crop, although the daily irrigation treatment performed slightly better.

The reason for the uniformity of the corn crop in the SDI field is ascribed to the consistency of schedule for all four treatments. This is an important finding for irrigation scheduling where automated scheduling is available.

4. Subsurface Drip Irrigation vs Low Energy Precision Application Sprinklers: There have been many comparisons regarding the water use merits of subsurface drip irrigation (SDI) compared to Low Energy Precision Application (LEPA) center pivots. In most known cases, project constraints of irrigation frequency for equal comparisons have limited the comparative value of each system in the attempt to eliminate biases. In 2020 at the WCC, comparative management of this comparative study was only constrained by the irrigation system capacity of 4 GPM / Acre. To minimize evaporative losses, LEPA is irrigated on an 8-day lap and the SDI field was irrigated daily. The irrigation systems were managed independently and could be turned off as frequently as desired.

In grain corn in 2020, SDI returned a 6-bushel yield increase with 4 acre-inches less water. Marginally reduced evaporation was noticed season long. The major contributor for reduced total water was the scheduling ability to turn-off the SDI system for any rainfall event that equaled or exceeded the daily irrigation system capacity of 0.21". This led to the SDI system being turned completely off for 22-days during the season, 17.5 more days off than the LEPA system. A system being turned completely off is the most dramatic conservation practice that can be employed in an irrigation regime.

5. Cotton Population Demonstration: The theory that higher cotton seeding rates provide a benefit in the North Plains was validated for the third consecutive season. The demonstration has four

planting rates, 45K, 60K, 90K, and 110K seeds per acre which are managed identically and harvested separately. In 2020, the higher seed drops yielded higher with better quality measures across the spectrum. The economics of this practice are still not obvious as additional seed is required to install this management program. The overall challenge within the cotton population demonstration has been poor early crop establishment and cold germination rates. The nominal germination rates across the treatments ranged from 50-60% in 2020, similar to the rates in 2019. This is a factorial problem that begins with low baseline germination rates and is compounded by cooler soil and air temperatures in early May. Efforts to improve early season cotton performance and germination will be considered at the WCC going forward.

6. Permanently Installed Soil Moisture Probes: Soil probes have proven to be an effective tool for improving water use efficiency and reducing the required amount of irrigation water applied to crops. The next iteration is a permanently installed probe in field crops that can be used for multiple crop seasons and provide monitoring continuity throughout the winter months. 2020 completed a two-year operation period for the earliest GroGuru permanent soil moisture meters installed at the WCC.

The GroGuru sensors proved to be a stepwise improvement over the previous iteration of capacitance-based soil moisture meters. The permanent installation is a less-expensive option if used for two or more seasons, delivers information in a clear and familiar way, provides soil moisture information during the off-season to help with pre-water and early irrigation events, and the probe hardware can be reliably planted and harvested over for multiple years.



Community Education

The annual xeriscape gardening and rainwater harvesting classes were postponed due to health and safety considerations relating to pandemic.

The District published reports on activities at the WCC and other demonstrations in the winter, summer and fall issues of the North Plains Water News as well as on the District website.

4. Financial Assistance

Management Objective:

The District will encourage the adoption of technologies that promote efficient use of groundwater and conserve water by providing the means to purchase the technology.

Performance Standards:

At least annually, the District will seek financial assistance for stakeholders regarding conservation equipment and practices.

Action Taken:

In 2020, the District applied for and received a \$250,000 grant to continue the Master Irrigator and ICI Programs, respectively. NRCS funding for the Master Irrigator Program ran out in 2019. The Master Irrigator funds were not used in 2020 since the program was cancelled due to restrictions on gatherings.

The District did continue to provide the following financial assistance programs through 2020:

- TWDB Irrigation Meter Reimbursement – reimbursed eligible irrigators up to half the cost of flow meters.
- TWDB Irrigation Conservation Initiative – reimbursed up to half the cost of certain approved conservation equipment for candidates who participated in a District-approved educational program.

5. Technical Assistance

Management Objective:

The District will assist stakeholders in collecting information and knowledge about practices and technologies that promote efficient use of groundwater.

Performance Standards:

The District will provide technical assistance to stakeholders when requested, and the information is beneficial for the efficient use of groundwater.

Action Taken:

In 2020, District contract agriculture engineer Nich Kenny assisted graduates of the Master Irrigator Program and others with the proper installation and operation of irrigation equipment to maximize performance and efficiency of the practices. In addition, the District received inquiries for groundwater-related technical assistance and provided information to help users conserve water. Technical services performed by the District included flow tests and water quality testing. The District also partnered with the United States Department of Agriculture – Natural Resources Conservation Service to assist with evaluation of variable frequency drives which allow for more control over electric irrigation motors. Finally, the District worked with the United States Geological Survey on water quality pumping to provide a water quality baseline of information that is available to the public upon request.

B. Controlling and Preventing the Waste of Groundwater

Management Objective:

Control and prevent the waste of groundwater as defined by state law.

Performance Standards:

The District will pursue any reported violations of the District’s rules concerning groundwater waste.

Action Taken:

The District received three water waste reports in 2020. Two were investigated and forwarded to the board as an enforcement matter. The third water waste matter was reported to the owner and the owner immediately addressed the issue.

C. Controlling and Preventing Subsidence

Controlling and preventing subsidence has historically not been considered as challenging in the High Plains Aquifer System compared to other aquifer systems in Texas.

Action Taken:

District staff reviewed the TWDB report on subsidence; “Final Report: Identification of the

Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with regard to Groundwater Pumping, TWDB Contract Number 1648302062. The report lists the Ogallala aquifer with a high risk of subsidence and states, “Subsidence Risk is high with high subsidence risk in large areas of the aquifer”.

The report lists the Dockum, Rita Blanca and Ogallala aquifers with a medium risk of subsidence and states, “subsidence potential exists but is not generally significant outside of hotspots within each aquifer”.

Considering the extent of the study and due to the depth of the water and the nature of the geology within the District, extensive subsidence is unlikely and the District’s Board of Directors, upon recommendation from qualified staff, have determined that this goal is not applicable to the District.

D. Addressing Conjunctive Surface Water Management Issues

Management Objective:

Address conjunctive water use issues with organizations that have relevant authority or jurisdiction.

Performance Standard:

Annually, the District’s representatives will attend at least 75% of Region A: Panhandle Regional Water Planning Group’s meetings. To further address conjunctive water use issues, the District will submit a copy of its management plan to the Canadian River Municipal Water Authority, Palo Duro Water District, and Red River Authority for their consideration and review.

Action Taken:

The Panhandle Water Planning Group (PWPG) Full Committee held a public meeting on Tuesday, February 18, 2020 at 1:30 PM in the Boardroom of the Panhandle Regional Planning Commission (PRPC), 415 W. 8th Avenue, Amarillo, Potter County, Texas. Steve Walthour, General Manager and Danny Krienke, GMA-1 Representative participated in the meeting.

The PWPG (Region A) held a scheduled public meeting on Wednesday September 25, 2020 at 10:00 AM. The meeting was held via video conference. Steve Walthour, General Manager and Danny Krienke, GMA-1 Representative participated in the meeting.

The PWPG (Region A) Prioritization Sub-Committee held a scheduled public meeting on Wednesday August 19, 2020 at 10:00 AM. The meeting was held via video conference. Steve Walthour, General Manager participated in the meeting.

The Texas Water Development Board appointed Steve Walthour, General Manager to represent Region A on the Interregional Planning Council (Council) on January 16, 2020. The purposes of the Council are to 1) improve coordination among the RWPGs, and between the RWPGs and the TWDB in meeting goals of the state water planning process; 2) facilitate dialogue regarding regional water management strategies; and 3) share operational best practices of the regional water planning process. Walthour was appointed Chairman of the Council’s Best Practices for Future Planning Committee. Walthour attended all Council and assigned committee meetings on April 29, May 28, June 10, June 22, June 29, July 15, July 21, July 28, July 29, August 12, August 20, September 15, and September 30 by video conference.

E. Addressing Natural Resource Issues that Impact the Use and Availability of Groundwater and which are Impacted by the Use of Groundwater

1. Aquifer Monitoring

Management Objective:

Monitor aquifer characteristics that affect utilization and availability of groundwater and which are affected by the use of groundwater through District programs by maintaining a network of monitor wells.

Performance Standards:

i. District staff will periodically collect and analyze water samples from appropriate monitor wells.

Action Taken:

Natural resources staff analyzed water samples from 16 monitor wells across the District, and water quality results were reported in aggregate in the 2019 Hydrologic Report.

ii. District staff will perform water quality analyses for select constituents for well owners upon request.

Action Taken:

Water samples were analyzed from 13 private wells upon request. Water quality results were reported in aggregate in the 2019 Hydrologic Report.

iii. Annually, District staff will summarize their water quality activities and make the information available to the Board of Directors and the public.

Action Taken:

Water quality activities are published in the annual Hydrologic Report and presented to Board of Directors for approval. The information is available in the District office and on the District website.

Table 4: Mineral analyses from wells within the District

Parameter	Units	2018 Number of Analyses	2018 Average Analyses Result	2019 Number of Analyses	2019 Average Analyses Result	2020 Number of Analyses	2020 Average Analyses Result
Sulfate	mg/l	32	50.8	29	44.68	16	*Pending
Nitrate	mg/l	22	11.14	29	1.653	16	*Pending
Total Iron	mg/l	22	0.234	29	.0433	16	*Pending
Chlorides	mg/l	22	60.77	29	30.57	16	*Pending
Fluoride	mg/l	22	.0466	29	.661	16	*Pending
Total Hardness	mg/l	22	217	29	208	16	*Pending

iv. District staff will collect aquifer water level measurements annually.

Action Taken:

Water levels for select District wells were measured in January and February and reported in the annual Hydrologic Report.

Table 5: Depth to water by county

Dallam	Hartley	Sherman	Moore	Hansford	Hutchinson	Ochiltree	Lipscomb
282 ft.	364 ft.	313 ft.	358 ft.	302 ft.	350 ft.	333 ft.	162 ft.

v. Annually, District staff will summarize groundwater level declines and average depth to water and make the information available to the Board of Directors and the public.

Action Taken:

Groundwater level declines and average depth to water are calculated and published in the annual Hydrologic Report.

Table 6: 2020 Average depth to water and comparisons of average decline in select District water level monitor wells

County	Avg. Depth to Water (ft.)	2020 Avg. Well Decline (ft.)	2019 Avg. Well Decline (ft.)	Current 5-Year Avg. Well Decline (ft.)	Previous 5-Year Avg. Well Decline (ft.)	Current 10-Year Avg. Well Decline (ft.)	Previous 10-Year Avg. Well Decline (ft.)
Dallam	282	2.58	2.61	2.63	2.82	2.74	3.19
Hansford	302	1.71	1.70	1.69	1.68	1.70	1.64
Hartley	364	3.05	3.08	3.12	3.24	3.19	3.56
Hutchinson	350	1.47	1.47	1.46	1.45	1.46	1.41
Lipscomb	162	0.49	0.49	0.49	0.44	0.44	0.43
Moore	358	2.34	2.34	2.33	2.31	2.32	2.08
Ochiltree	333	1.18	1.14	1.11	0.97	1.03	0.78
Sherman	313	2.48	2.45	2.43	2.37	2.37	2.32
District-wide	308	1.91	1.91	1.91	1.91	1.91	1.93

vi. At least on a two-year cycle, District staff will summarize or update aquifer saturated material information and make the information available to the Board and the public.

Action Taken:

The District calculates saturated thicknesses every other year and using District monitor well data. The next scheduled update will be published in 2021.

Table 7: 2020 Estimated average aquifer thickness by county (District area only).

Dallam	Hartley	Sherman	Moore	Hansford	Hutchinson	Ochiltree	Lipscomb
164 ft.	132 ft.	140 ft.	118 ft.	163 ft.	128 ft.	137 ft.	218 ft.

2. Deteriorated Wells

Management Objective:

Investigate and address deteriorated wells that may pose a threat to water quality.

Performance Standard:

District staff will pursue repair or plugging of deteriorated wells.

Action Taken:

In 2020, District staff inspected approximately 1600 wells. Staff found no deteriorated wells that had to be plugged, but they did observe 190 wells that contained casing in good condition but that did not meet the following conditions: 1) The well had been capped with a covering that is not easily removed. 2) If a cap is present it must be capable of sustaining weight of at least 400 pounds. 3) The well is sealed to prevent the pollution of groundwater. Staff instructed the owners in writing as to how to bring these wells into full permanent compliance.

3. Aquifer Information

Management Objective:

The District will provide easy access to public information available about the aquifers and wells within the District’s jurisdiction.

Performance Standards:

The District will maintain a web-based application for providing information about the groundwater resources in the region.

Action Taken:

The public can view a variety of maps and publications related to District groundwater resources on the District’s website at www.northplainsgcd.org. The subpage for Aquifer Data & Maps had the highest number of visitors in 2020, with 1,574 page views.

F. Addressing Drought Conditions

North Plains Groundwater Conservation District lies in an area of the State of Texas that has a year-round, semi-arid climate. The area experiences generally dry conditions year-round compared to other areas of the state. The District works to educate the public about methods to conserve water all year, but particularly during dry periods.

1. Current Drought Conditions

Management Objective:

Provide information about the current drought conditions in the area.

Performance Standards:

Maintain information about the current drought conditions on the District’s website.

Action Taken:

The District links to the weekly drought monitor published by the National Drought Mitigation Center at University of Nebraska – Lincoln on the website at www.northplainsgcd.org.

2. Conservation Education

Management Objective:

Provide stakeholders with information and tools to conserve during dry and peak use periods.

Performance Standards:

Annually, the District will conduct water conservation communications and education activities.

Action Taken:

Drought conditions and water conservation tips were communicated through the District’s social media accounts and website. Annual Summer Showers Outreach Program was cancelled due to health and safety concerns relating to the pandemic.

G. Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, and Brush Control, Where Appropriate and Cost-Effective

1. Conservation

a) Groundwater Conservation Reserve Program

Management Objective:

Provide program allowing permitted well owners that timely report their groundwater production to retain any unused allowable annual production for future years, promoting the conservation of groundwater.

Performance Standards:

Annually, District staff will report to permitted well owners the well owner’s conservation reserve.

Action Taken:

On December 4, 2020, the District reported available Groundwater Conservation Reserves to each non-exempt well owner or the well owner’s agent on 2,901 2020 Production Reporting forms. Cumulative reserve totals were provided by request.

b) Conservation Education**Management Objective:**

Conduct conservation education activities to encourage water conservation and create informed and educated citizens who will be dedicated stewards of their resources.

Performance Standards:

Annually, the District will disseminate groundwater conservation and waste prevention information through a variety of media, activities, and events.

Action Taken:

The need for social distancing limited the District to traditional and social media to extend the message of the value of water and the individual responsibility for water conservation. From newsletters delivered to a list of over 2000 emails and 1000 traditional mail boxes, to social media posts available worldwide, the District reached thousands with this important information.

An additional tool for outreach that began in 2019 and continued into 2020 is the radio education series called the Ag Water Update. The Ag Water Update is made up of a series of one-minute radio spots designed to keep listeners informed about the District’s ongoing agriculture water conservation demonstrations. District contract agricultural engineer Nich Kenny talks about what he is seeing in the fields at the Water Conservation Center and how the District is addressing water conservation as a part of the daily operations at the farm. The Ag Water Update is heard throughout the growing and harvest season on KXIT (Dalhart), KDDD (Dumas), KEYE (Perryton) and KXDJ (Perryton). Kenny and District staff work with KXDJ to continually produce relevant content for the series.

District conservation outreach activities

Date	Event	Attendance
Jan 13-16	Pioneer Crop Production Clinics – Nich Kenny, Steve Amosson and Kirk Welch shared about District demonstrations and activities	350
February 13	Panhandle Water Conservation Symposium, Corn/Cotton Rotation in the Texas North Plains - Nich Kenny, North Plains GCD	75
February 27	Green Acres in-class soil properties lab – Curtis Schwertner, Paige Glazner and Krista Hopkins	60
March 10	NPGCD Grower Meeting – Nich Kenny – North Plains WCC	25
March 10	NPGCD Grower Meeting – Jourdan Bell, Ph.D. – North Plains WCC	25
March 10	NPGCD Grower Meeting – Jourdan Bell, Ph.D. - Youtube	20
May 5	Virtual Field Day – Nich Kenny - Youtube	82
May 13	KEYE Coffee Break – Kirk Welch	unknown
October 24	Dallam County 4-H Wildlife Project – Kirk Welch	10
November 10	Virtual Field Day – Nich Kenny - Youtube	66



Outreach team members (l to r) Krista Hopkins and Paige Glazner at the Dupont Pioneer Texas Panhandle Crop Production Clinic in Dalhart.

Partnerships

The District's outreach efforts are multiplied through partnerships with organizations who share common goals. For example, the District sponsored and presented at the DuPont Pioneer Texas Panhandle Crop Production Clinics in January in Dalhart, Dumas, Stratford, and Spearman. At each of these meetings, Nich Kenny, Steve Amosson and Kirk Welch delivered presentations regarding District demonstrations and programs. The District also provided support to the Texas Alliance for Groundwater Districts' annual Texas Groundwater Summit which was presented virtually in 2020.

Annually, the District joins in to participate in, and contribute to, community celebrations in towns across the District. In 2020, this opportunity was unavailable as the celebrations were cancelled in the interest of health and safety.

The District's social media platforms continue to grow steadily, providing additional avenues to communicate District information, water conservation tips, and groundwater-related content. In 2020 the District's Twitter page had a total of 1000 followers, Instagram had 284 followers and the Facebook page had 597.

Cotton and Conservation Video Series and Virtual Field Days

In its second season in 2020, the Cotton & Conservation educational video series, a cooperative program with Texas A&M AgriLife Extension, was a program that, by its nature, could be effective in the midst of social gathering restrictions. The video and web-based program was designed to provide individual access, from anywhere, to anyone interested in growing cotton in the northern Panhandle of Texas. The unintended advantage of this type of program during the pandemic was that it made it possible to gain the information while maintaining social distancing.

The Project Advisory Committee (PAC), made up of local cotton growers, industry representatives and educators was assembled as the District Board of Directors recognized the proliferation of cotton in the District. The District had historically been corn country, but in 2018 growers planted more acres to cotton than corn for the first time in history. The cotton PAC recognized a need for basic information about how to grow cotton efficiently north of the Canadian River and they said it had to be designed to fit around people's busy schedules.

Texas A&M AgriLife Agronomist Dr. Jourdan Bell took the suggestions of the PAC and created a cooperative program by which Texas A&M would provide agricultural expertise and the District would provide funding and outreach support. For the last two years, the Cotton and Conservation video productions have documented real-world cotton growing experiences from multiple farms across the District. In 2020, staff created 15 Cotton and Conservation videos, generating 150 views.

Another video series that began in 2019, continued in 2020. The Virtual Field Day series was created to make the traditional field day event better, by making the information accessible to anyone, anytime. District contract agricultural engineer, Nich Kenny, and Texas A&M's Dr. Jourdan Bell provided updates on the progress of agricultural demonstrations ongoing at the WCC. The video presentations were organized by topic, so growers could watch whichever sessions they wanted, at their convenience. The Virtual Field Day playlist can be found on YouTube and at www.northplainsgcd.org/virtualfieldday.

The District shares these videos and other information on a variety of social media sites. You'll find the District on Facebook, Twitter (@northplainsgcd), Instagram (@northplainsgcd), YouTube, and LinkedIn.

c) Conservation Rule Compliance

Management Objective:

Monitor and enforce compliance to District Rules.

Performance Standards:

The District staff will report the enforcement to the Board as needed.

Action Taken:

In 2020, District well owners filed 2885 Annual Groundwater Production Reports for 2019. Timely groundwater use reports were provided for 2876 Groundwater Production Units within the Annual Allowable Production limit. Of the 9 production units that exceeded groundwater withdrawal limits, 9 were administratively resolved.

Table 9: 2019 Annual Production Reporting Compliance

Compliance with District Rules	Exceeded Groundwater Production Limit	Administratively Resolved	Completed Enforcement Action
2876	9	9	0

A compliance matter is only considered an enforcement action if administrative remedies have been exhausted and the person is required to appear before the Board of Directors.

d) Recharge Enhancement

The District has limited surface water resources to achieve enhanced recharge through diversion or infiltration of surface water. The District explored recharge enhancement through its precipitation enhancement program, and the District discontinued funding for the program in 2006. The District could not quantify if, or to what extent, the program positively affected recharge or groundwater use in the District. The Board of Directors determined recharge enhancement through surface water diversion, infiltration, or precipitation enhancement is not currently viable or practical. For this management plan, this goal is not applicable to the District.

2. Rainwater Harvesting

Management Objective:

The District promotes rainwater harvesting by maintaining rainwater harvesting information at the District office and provides literature about its benefits at a public meeting held at least once annually.

Performance Standards:

Annually District staff will report to the Board of Directors the number of people who attended the rainwater harvesting meetings.

Action Taken:

The rainwater harvesting class was cancelled in 2020 due to health and safety concerns related to the pandemic.

3. Precipitation Enhancement

The District discontinued its funding for the precipitation enhancement program in 2006. The District could not quantify if, or to what extent, the program positively affected recharge or groundwater use. The Board of Directors determined that precipitation enhancement is not currently viable or practical. For this management plan, this goal is not applicable to the District.

4. Brush Control

The District has a semi-arid climate, has very little surface water, experiences low annual rainfall and has a depth to groundwater exceeding 300 feet. Considering the District's low rainfall, depth to groundwater and lack of surface water resources; brush control as a form of recharge enhancement or groundwater conservation is not practicable or effective. The District has determined that brush control is not a viable groundwater conservation goal for this area and is therefore not applicable.

H. Addressing the Desired Future Conditions

1. Compare DFCs to Aquifers' Conditions

Management Objective:

Monitor the condition of the aquifers and status of groundwater production compared to the adopted DFCs.

Performance Standards:

Annually review groundwater production information, GAMs, and water level measurements to characterize aquifer conditions compared to the DFCs.

Action Taken:

The Board reviewed groundwater production information, GAMs, and water level measurements to characterize aquifer conditions compared to the DFCs on Tuesday, June 9, 2020 via video conference.

Table 10: Production Compared to Modeled Available Groundwater

County	2020 MAG	2019 Production	2019 Percent Difference between MAG and Production	Average Production 2015-2019	Average Percent Difference between MAG and Production 2015-2019
Dallam	401,663	303,200	-24.51%	320,300	-20.26%
Hartley	409,187	349,200	-14.66%	374,400	-8.50%
Moore	219,654	157,760	-28.21%	174,800	-20.42%
Sherman	398,183	255,400	-35.86%	273,900	-31.21%
Hansford	275,016	162,300	-40.99%	163,800	-40.44%
Hutchinson	62,803	68,400	8.91%	66,600	6.05%
Lipscomb	266,809	43,400	-83.73%	42,700	-84.00%
Ochiltree	243,778	81,800	-66.44%	82,700	-66.08%
West	1,428,687	1,065,500	-25.42%	1,143,400	-19.97%
East	848,406	355,900	-58.05%	355,800	-58.06%
Total	2,277,093	1,421,400	-37.58%	1,499,200	-34.16%

2. Joint Planning

Management Objective:

The District will participate in the joint planning process of the Groundwater Management Area 1 with other groundwater conservation districts.

Performance Standards:

A District representative will participate in each GMA-1 joint planning meeting.

Action Taken:

The Groundwater Management Area Number 1 (GMA #1) met on Tuesday, February 18, 2020 at 9:30 am. in the PRPC Board Room, 415 SW 8th Avenue, Amarillo, Texas with the following North Plains GCD representatives in attendance: Bob Zimmer, Joint Planning Committee Chairman; and Steve Walthour, General Manager.

The GMA #1 met on Thursday, May 21, 2020 at 9:30 am by video conference with the following North Plains GCD representatives in attendance: Bob Zimmer, Joint Planning Committee Chairman; and Steve Walthour, General Manager.

The GMA #1 met on Thursday, June 25, 2020 at 9:30 am by video conference with the following North Plains GCD representatives in attendance: Bob Zimmer, Joint Planning Committee Chairman; and Steve Walthour, General Manager.

The GMA #1 met on Thursday, July 23, 2020 at 9:30 am by video conference with the following North Plains GCD representatives in attendance: Bob Zimmer, Joint Planning Committee Chairman; and Steve Walthour, General Manager.

The GMA #1 met on Thursday, September 24, 2020 at 9:30 am by video conference with the following North Plains GCD representatives in attendance: Bob Zimmer, Joint Planning Committee Chairman; Steve Walthour, General Manager.

The GMA #1 met on Thursday, November 19, 2020 at 9:30 am by video conference with the following North Plains GCD representatives in attendance: Bob Zimmer, Joint Planning Committee Chairman; and Steve Walthour, General Manager.

3. Allowable Production Limitation

Management Objective:

Manage groundwater withdrawal amounts based on allowable production limits to achieve DFCs.

Performance Standards:

The Board of Directors will review groundwater withdrawal amounts annually, and may modify annual allowable groundwater production limits consistent with its Rules to achieve the DFCs and preservation of the groundwater resources in the region.

Action Taken:

The Board of Directors reviewed annual groundwater withdrawal on Tuesday, June 9, 2020. The Board meeting was conducted via video conference and teleconference. The Board determined it was not necessary to modify production limits.

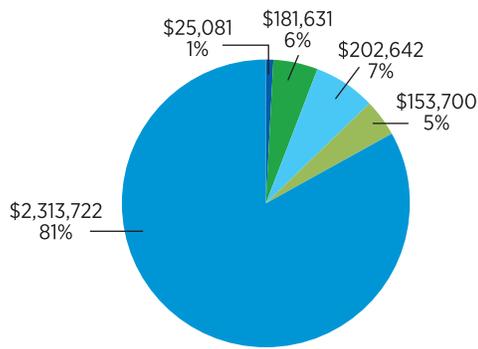
I. Other Management Goals Included in the Plan by the District

No other management goals are listed at this time.

DISTRICT FINANCIALS

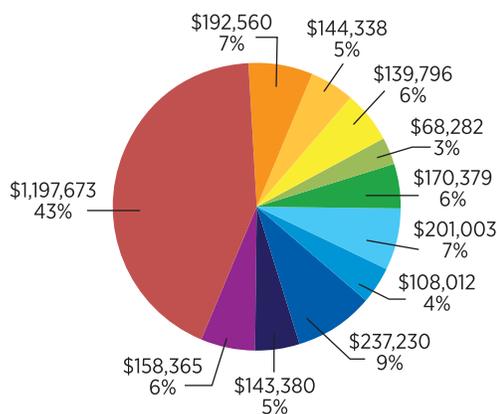
For the fiscal year ending September 30, 2020, the District's net financial position increased by approximately \$20,000, or 4.15%, because of this year's operations. During the year, the District had expenditures that were \$20,000 less than the \$2.88 million generated in taxes, fees, and other revenues for District programs. The total costs for all District activities this year was \$2.7 million. However, taxpayers ultimately financed \$2.34 million for these program activities, because approximately \$200,000 of the costs were paid by those directly benefitting from the programs and approximately \$150,000 by other government agencies through conservation grants. The District combined fund balance increased from \$2.11 million in 2019 to \$3.22 million in 2020. The fund balance increased by \$1.11 million. At the end of fiscal year 2020, the District had \$2.28 million invested in a broad range of capital assets including facilities and equipment for water conservation.

The following charts show the District's revenues and other financing sources as well as the District's expenditures based on budget area and program area for the fiscal year ending September 30, 2020.



Revenues and Other Financial Sources

- Property Taxes
- State & Federal Grants
- Fees for District Services
- Other Revenue
- Investment Earnings



Total Expenditures

- Personnel
- Professional Fees
- Contracted Services
- Administrative Expenditures
- Vehicle/Repair/Supplies
- Debt Service
- Conservation Demonstrations Project
- Aquifer Science
- Conservation Outreach
- Capital Outlay
- Technology/Communications/Utilities

