North Plains
GROUNDWATER CONSERVATION DISTRICT

Groundwater Management Plan

2008-2018

Revised
May 2008

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STATEMENT OF GUIDING PRINCIPLES

The North Plains Groundwater Conservation District provides for the conservation, preservation, protection, recharging, and prevention of waste of the groundwater within the defined boundary of the District. The Ogallala aquifer, the primary groundwater resource in the District, and the Dockum aquifer and Rita Blanca aquifer, secondary resources in the District are of vital importance in the growth and sustainability of the ecology and the economy of the Northern Texas Panhandle. These aquifers are limited groundwater resources and must be conserved and preserved for future generations. The preservation of these most valuable resources can be managed in a prudent and cost-effective manner through conservation, research, education, regulation, and permitting. The District's overall management standard is to have at least 50% of the 2008 total groundwater volume in the District still available fifty (50) years after the adoption of this plan. The District's management standard is to have at least 40% of the 2008 total groundwater volume available in the area comprised of Dallam, Hartley, Moore and Sherman counties within the District and 60% of the 2008 total groundwater volume available in the area comprised of Hansford, Hutchinson, Lipscomb, and Ochiltree counties within the District remaining in 2058. Maintaining the 50% standard will be accomplished using the District's Rules, programs, and procedures.

Since the Texas Water Development Board (TWDB) originally certified the plan in 1998, the District has adopted rules, programs and procedures to manage groundwater withdrawals while protecting the socio-economic conditions within the District. The District's Board may consider, deliberate and weigh any factor, evidence or testimony before it that it deems necessary in making any findings and revisions to this groundwater management plan, or the District's Rules. In doing so, the District's Board may consider the following criteria:

(i) any revision based on sound science;
(ii) any socio-economic impact reasonably expected to occur;
(iii) any environmental impacts;
(iv) state policy and legislative directives; and
(v) any other information relevant to a specific condition.

These deliberations shall be part of the official record of the District.

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SECTION 1 - INTRODUCTION

A. Purpose of the North Plains Groundwater Conservation District Management Plan.

In 1997, the 75th Texas Legislature enacted Senate Bill 1 (SB 1), which revised many long-standing state water laws and policies. The initial groundwater management plan (GMP) was to be submitted to the TWDB for review and certification by September 1, 1998. The North Plains Groundwater Conservation District (District) adopted its initial GMP on August 18, 1998.

In 2001, the 77th Texas Legislature enacted Senate Bill 2 (SB 2), significantly amending SB 1. Some of the amendments affecting groundwater management planning include new planning requirements for addressing drought conditions and conservation. Additionally, SB 2 requires the District to use the best available data in developing its GMP, and to submit its GMP to the regional water planning area in which the District is located. The District is located in the Panhandle Water Planning Area (PWPA). The District must request that the regional planning group in PWPA review the GMP and specify any area(s) of conflict with the approved Regional Water Plan. A copy of the PWPA 2006 Regional Water Plan can be found at www.panhandlewater.org.

To comply with the initial five-year revision or re-adoption provision and the amendments to SB 1, the District's revised GMP, contained herein, includes the planning requirements from SB 2. The District has developed this document in accordance with the requirements of Chapter 36 of the Texas Water Code (TWC), and the provisions of Title 31 Texas Administrative Code Chapter 356, Groundwater Management Plan Approval.

The District will consider all groundwater uses and needs and will develop rules which are fair and impartial to implement this management plan. This plan fulfills all requirements for groundwater management plans in Chapter 36, Texas Water Code and the administrative Rules of the TWDB.

The plan further addresses the process established by the District to monitor changes in the aquifer, communicate to the public the findings, and ensure that the plan can adapt through time to meet the needs of the citizens within the District. The District developed this management plan using the District's best available data, including the groundwater availability modeling ("GAM") information provided by the TWDB, together with the District's site-specific data which has been provided to the TWDB for review. The District forwarded a copy of the proposed management plan to the surface water management entities in the area, the Panhandle Regional Water Planning Group and Groundwater Management Area 1 member Districts for review and comment. Upon adoption, the District will forward the final management plan to these same entities.

The District adopted its original management plan on August 18, 1998. The original management plan is repealed and replaced by this plan.

B. Mission of North Plains Groundwater Conservation District.

The purpose of this District is to provide for the conservation, preservation, protection, recharging, and prevention of waste of the groundwater, and of groundwater reservoirs, or their subdivisions within the defined boundary of the District. To carry out this purpose, rules and regulations have been adopted. These rules and regulations will be enforced to minimize: draw-down of the water table, depletion of the groundwater reservoirs and aquifers, interference between wells, reduction of artesian pressure, waste of groundwater, and pollution or harmful alteration of the character of the groundwater. The District will promote conservation to extend the longevity of groundwater resources, and to manage the groundwater effectively based upon ecological and socio-economic systems unique to the aquifers within the North Plains Groundwater Conservation District.

The purpose of the District is achieved through research and education programs, District-provided services, mutual cooperation of local, state, and federal agencies, mutual cooperation with non-governmental entities, and management as provided by Texas law. The District issues water well permits, collects groundwater information, performs water quality analyses, provides well system tests, enforces well spacing and limits groundwater withdrawals. Extensive databases are used to store, retrieve, and analyze the groundwater information for the District. It is the belief of the District's residents and the District's Board of Directors that groundwater is best managed locally through a groundwater conservation district. This belief is realized by the adoption and implementation of a management plan outlining the goals, methods, and procedures to be utilized in the management of the groundwater resources of the District. This management plan will provide a better understanding of the goals and objectives of the District by the residents and promote cooperation in its implementation. The District's Board will consider all groundwater uses and needs and will develop rules which are fair and impartial to implement this management plan.

C. History and Statutes.

In 1949, the Texas Legislature authorized the creation of Underground Water Conservation Districts to perform certain prescribed duties, functions, and hold specific powers as set forth in Article 7880-3c, Texas Civil Statutes. The Legislature codified this portion of the Texas Civil Statutes into Chapter 52 of the Texas Water Code. Later, the Legislature amended the Texas Water Code (TWC) and moved the statutes into TWC Chapter 36.

In 1955, voters created the North Plains Groundwater Conservation District through a confirmation election. Sherman, Hansford, Ochiltree, and the area north of the Canadian River in Hartley, Moore, and Hutchinson counties comprised the original area of the District. Since the original confirmation election, voters in Lipscomb County elected to join the District in 1973; voters in part of Dallam County elected to join the District in 1993; and the Dallam County Underground Water Conservation District No. 1 voted to join the District in 2004.

The District derives its authority to manage groundwater within the District by virtue of the powers granted and authorized pursuant to Section 59, Article XVI, Texas Constitution and TWC Chapter

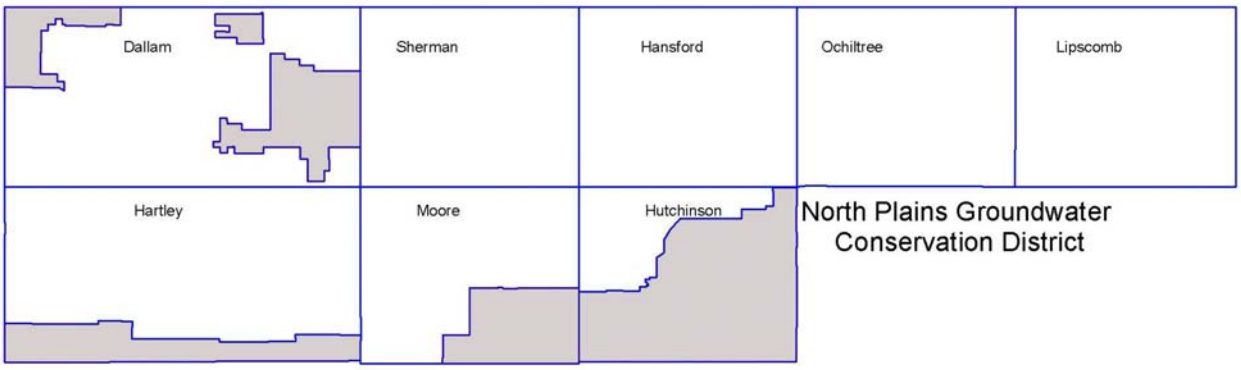
36. The District, acting under such authority, assumes all of the rights and responsibilities of a groundwater conservation district specified in TWC Chapter 36.

The District's goal is to provide sound management of groundwater resources and make every effort to insure that an abundant supply of potable water will be available for many future generations.

D. North Plains Groundwater Conservation District Area.

Planning Area

The District's jurisdiction is limited to the groundwater resources within a 6800 square mile area that includes all of Sherman, Hansford, Ochiltree, Lipscomb, and parts of Dallam, Hartley, Moore and Hutchinson counties. The District is located north of Amarillo and also north of the Canadian River.



Since the District does not cover all of Dallam, Hartley, Hutchison, and Moore counties, data provided by the TWDB was used for all estimates related to demand based on a proportional area percentage. This percentage is derived by dividing the amount of acres or square miles covered by the District by the total number of acres or square miles contained within each county. The total county areas; the total county areas in the District; and the TWDB computation of the percentage of county areas within the District are as follows:

County	County Area (Sq. miles)	Area in District (Sq. miles)	Percent Area in District
Dallam	1505	1075	71.95
Hansford	907	907	100.00
Hartley	1489	1267	85.10
Hutchinson	911	266	29.20
Lipscomb	934	934	100.00
Moore	914	633	69.26
Ochiltree	907	907	100.00
Sherman	916	916	100.00
Totals	**8483**	**6905**	**81.94**

Planning Area Description

Groundwater is the primary water supply source for an agricultural economy within the eight counties associated with the District. In 2006, the County Extension Program Councils' estimated the cash value of all crops and livestock within the region at $1.257 billion. According to the 2005 US Census reports, the counties associated with the District have 75,174 residents. The census data does not reflect population changes related to probable population increases in the District associated with economic development of the dairy or the petroleum industries in the area.

The TWDB provided population projections for each of the counties in the PWPA 2006 Regional Plan. The TWDB projected that the population in the counties associated with the District totaled 76,355 in 2000 and would grow to 93,655 by 2060. The following table reflects the TWDB projected population from the PWPA 2006 Regional Water Plan for each of the counties associated with the District.

COUNTY	2000	2010	2020	2030	2040	2050	2060
Dallam	6,222	6,851	7,387	7,724	7,808	7,645	7,291
Hansford	5,369	5,699	6,148	6,532	6,948	7,191	7,406
Hartley	5,537	5,697	5,889	5,989	6,026	5,950	5,646
Hutchinson	23,857	24,320	24,655	24,311	23,513	22,209	21,087
Lipscomb	3,057	3,084	3,149	3,054	2,966	2,925	2,784
Moore	20,121	23,049	26,241	29,057	31,293	32,655	33,474
Ochiltree	9,006	9,685	10,440	11,001	11,380	11,566	11,803
Sherman	3,186	3,469	3,770	3,886	4,005	4,110	4,164
Total	**76,355**	**81,854**	**87,679**	**91,554**	**93,939**	**94,251**	**93,655**

Source: PWPA 2006 Regional Plan

E. The District's Board of Directors.

The District is governed by a seven-member elected Board of Directors. Each Director is elected from a defined area within the District for a four-year term. The elections are held in May of each even-numbered year in accordance with TWC Chapter 36 and the Texas Election Code. The District's Board elects officers after each Director election and these officers serve for two-year terms. As of December 1, 2007, the District's Board of Directors is listed below.

Area	Board Member	Term Expiration Date
Dallam County	Brian Bezner	Elected 5/08 – 5/12
Hansford/Hutchinson	Bob Zimmer	Elected 5/08-5/12
Hartley	Phil Haaland	Elected 5/06-5/10
Lipscomb	Gene Born	Elected 5/08-5/12
Moore	Kurt Stallwitz	Elected 5/06-5/10
Ochiltree	Danny Krienke	Elected 5/08-5/12
Sherman	Wesley Spurlock	Elected 5/06-5/10

The Board of Directors hold regular meetings at the District office located at 603 East 1st Street, Dumas, Texas 79029.

The District's Board develops and adopts the rules and programs, establishes District practices, hires the general manager, sets the annual budget, and determines the tax rate needed to carry out the operations of the District. The Directors conduct themselves in a manner consistent with sound ethical and business practices; consider the public interest in conducting District business; avoid impropriety, or the appearance of impropriety, ensure and maintain public confidence in the District; and control and manage the affairs of the District lawfully, fairly, impartially, and without discrimination, and in accordance with the stated purposes of the District. In September 2005, the District's Board developed and adopted a document which sets forth North Plains Groundwater Conservation District's Director Policies.

F. Administrative.

The District employs a general manager to manage the administrative affairs of the District and who, in the absence of the secretary of the District's Board, may act as secretary to the District's Board and may attest on behalf of the District. The general manager performs all duties set forth in District's Rules, personnel policies, and the job description of the District's general manager to the reasonable satisfaction of the District's Board of Directors. The general manager's duties specifically include the employment and supervision of the District's personnel, oversight of the District's financial matters, attendance of District Board and Board Committee meetings, and the submission of reports to the District's Board concerning all phases of the services and operations of the District. Further, the general manager's duties include the continued review and development of the District's Rules and the enforcement of the District's Rules. The general manager also performs any other duties which may be assigned to him by the District's Board from time to time.

The District maintains a qualified staff to assist water users in protecting, preserving, and conserving the aquifer. The Board of Directors bases its decisions on the best data available in order to treat all water users fairly and equally. The Board of Directors determines the programs and activities that the District shall undertake to provide the best possible service to the area. The District's Rules are enforced to protect the quality of the groundwater and to prevent the waste of this precious resource.

The District's physical address is 603 East 1st Street, Dumas, Texas, and the District's mailing address is PO Box 795, Dumas, Texas 79029. The District maintains a website www.npwd.org that contains additional information regarding District activities, rules and personnel.

G. Planning Period.

This plan, which uses a ten-year planning horizon, becomes effective upon adoption by the District's Board. The plan remains in effect until a revised plan is certified or February 19, 2018, whichever is earlier. The District may modify, change, revise and/or amend the plan as needed in accordance with TWC §36.1072(e). The District's Board may review the management

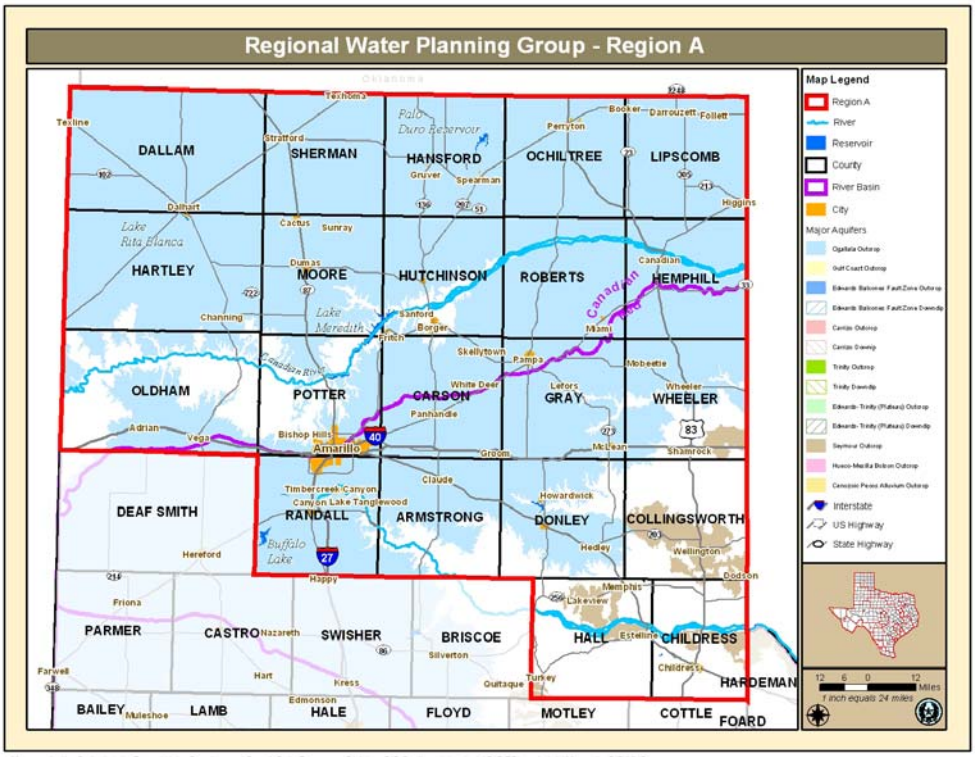
plan annually and must review and readopt the plan, with or without revisions, at least once every five years. This management plan uses a planning period of at least ten (10) years.

H. 2007 State Water Plan.

The State Water Plan is based on regional water plans that are prepared by appointed regional water planning groups in 16 regional water planning areas. The regional water planning groups are directed to prepare consensus-based regional water plans. The TWDB adopted the 2007 State Water Plan on November 14, 2006. This plan represents the second state water plan developed through the regional water planning process allowing the planning groups to include better information about the state's water resources in meeting future water needs. Based on the regional water planning groups' recommendations, TWDB developed policy recommendations. The 2007 State Water Plan includes the details, information, and analyses to support these recommendations. A copy of the 2007 State Water Plan can be obtained from the TWDB website at www.twdb.state.tx.us. The District has reviewed the 2007 State Water Plan and the District has incorporated the State goals into this Groundwater Management Plan.

I. Panhandle Water Planning Group.

The District is an active member of the Panhandle Regional Water Planning Group in the development of a 50-year 2006 Regional Water Plan for PWPA. The plan is included as part of the 2007 State Water Plan. The following figure shows the area of the PWPA. (Regional Water Planning Group- Region A). The PWPA includes 21 counties in the north and northeast area of the Texas Panhandle.



Source: PWPA 2006 Regional Management Plan

The 2006 Regional Water Plan recommends water conservation as the first strategy applied to meet every projected shortage. In the strategy selection process, the yield and environmental impact of projects are given greater consideration than the unit cost of water. The PWPA adopts a regional water management plan recommending using not greater than 1.25% of annual saturated thickness within the aquifer as a management option for long-term sustainable management of the aquifer to meet local demands. This recommendation is translated for implementation of the PWPA initial policy goal to have 50% of 1998 saturated thickness remaining in 50 years. According to the PWPA 2006 Regional Water Plan, on a water user group basis, the total demands exceed the total available supply beginning in 2010, in large part being attributed to the 1.25% policy limitation on the supply. Most of the shortages are attributed to large irrigation demands that cannot be met with available groundwater sources. Other shortages are due to limitations of contractual agreements, infrastructure, and/or growth. Irrigation shortages are identified for Dallam, Hartley, Hutchinson, Moore, and Sherman counties starting in 2010. Shortages for Hartley and Hutchinson counties are partially attributed to high agricultural use that is confined to only a portion of the county. All of these counties rely heavily on the Ogallala for irrigation supplies.

J. Groundwater Management Area 1.

The Texas Legislature created Groundwater Management Areas to ensure more regional cooperation and planning between different groundwater conservation districts. The Groundwater Management Area boundaries are intended to coincide as closely as possible with the boundaries of a shared groundwater resource, in this case the sub-basins of the Ogallala aquifer. The District is located within Groundwater Management Area 1 (GMA 1), that also includes Panhandle Groundwater Conservation District, Hemphill Underground Water Conservation District, and parts of the High Plains Groundwater Conservation District. The District participates as an active member of GMA 1 and is committed to achieving the GMA 1 goal of setting a Desired Future Condition (DFC) for the aquifer and/or each of the aquifer's sub-basins in the area. The DFC must be submitted to the Executive Administrator of the TWDB before September 1, 2010. The District will amend this GMP once the DFC set by GMA 1 has been finalized by the administrative process provided in 31 TAC Chapter 356.

SECTION II - GROUNDWATER

A. General Geology and Hydrology.

The Ogallala aquifer is the primary aquifer within the North Plains Groundwater Conservation District. The Ogallala Formation unconformably overlies Permian, Triassic, Jurassic, and Cretaceous strata and consists primarily of heterogeneous sequences of coarse-grained sand and gravel in the lower part grading upward into fine clay, silt, and sand. Water-bearing areas of the Ogallala Formation are hydraulically connected except where the Canadian River has partially or totally eroded through the formation to separate the North and South Plains. Water-bearing units of Cretaceous and Jurassic ages combine to form the Rita Blanca aquifer in the western part of Dallam and Hartley counties. Underlying these aquifers and much of the Ogallala are Triassic (Dockum aquifer) and Permian formations. Some hydraulic continuity occurs between the Ogallala Formation and the underlying Cretaceous, Triassic, and Permian formations in many areas of the High Plains. For the purposes of this document, the Ogallala Aquifer will be considered to consist of the saturated sediments of the Ogallala Formation and any underlying, potable water-bearing units hydraulically connected with it.

B. Current Volume in Storage.

The saturated thickness of the Ogallala Aquifer in the District ranges from 10 feet to over 460 feet with an estimated District average of 180 feet. The depth from land surface to the base of the aquifer can range from the land surface to as much as 1000 feet below surface. The depth to static water level from land surface can range from the land surface to in excess of 500 feet. Based on saturated thickness mapping and groundwater production reporting in 2006, the District estimates the usable quantity of groundwater within the District was in excess of 133 million acre-feet in 2006.

The year 2000 volume in storage is taken from Table-1 of the TWDB document "GAM Run 07-19". A GAM is a Groundwater Availability Model. The goal of a GAM is to develop a realistic and scientifically accurate computer model that represents the aquifer, its water budget, and its groundwater processes such as recharge, discharge, and pumping. The TWDB data includes all of Dallam, Hartley, Hutchinson and Moore counties. However, only portions of these counties are located within the District. Therefore, in computing the total water stored in the Ogallala aquifer in the District, the TWDB data for each of these counties is prorated based upon the percentage of each county within the District.

County	2000	2010	2020	2030	2040	2050	2060
Dallam	12,962,203	10,766,857	8,934,892	7,455,811	6,325,891	5,558,599	4,991,881
Hansford	21,693,703	20,385,024	19,092,753	17,850,094	16,716,209	15,729,410	14,852,445
Hartley	21,211,197	18,841,781	16,690,588	14,995,126	13,927,855	13,250,623	12,793,702
Hutchinson	3,250,268	3,005,580	2,768,124	2,555,425	2,373,250	2,231,766	2,119,199
Lipscomb	18,640,279	18,526,166	18,413,261	18,305,998	18,210,229	18,128,137	18,055,287
Moore	7,387,985	6,143,441	4,930,678	3,860,862	3,044,639	2,461,010	2,028,968
Ochiltree	19,795,557	18,847,872	17,955,425	17,118,070	16,368,979	15,724,576	15,156,476
Sherman	19,498,315	16,814,464	14,188,402	11,708,499	9,545,592	7,794,612	6,390,606
TOTAL	**124,439,507**	**113,331,185**	**102,974,123**	**93,849,885**	**86,512,644**	**80,878,733**	**76,388,564**

The table below represents total water in storage in the Dockum aquifer in the District (storage volumes were adjusted based on TWDB data by applying a prorata distribution to Dallam, Hartley, and Moore Counties.)

County	Total Volume in County	Total Volume in District
Dallam	6,561,800	4,772,397
Hartley	6,374,320	5,424,546
Moore	7,387,985	5,119,135
TOTAL	**20,324,105**	**15,316,078**

Source: TWDB Report 359, December 2003

The production reported to the District by users for the year 2006 was used to estimate usage for each year since 2000 to calculate a current volume in storage. The current volume in storage for the District is estimated to be 133,558,000 acre-feet.

C. Projected Groundwater Supply within the District.

Ogallala Aquifer

The Ogallala aquifer is present in all counties in the District and is the region's largest source of water. The Ogallala aquifer consists of Tertiary-age alluvial fan, fluvial, lacustrine, and eolian deposits derived from erosion of the Rocky Mountains. The Ogallala unconformably overlies Permian, Triassic, and other Mesozoic formations and in turn may be covered by Quaternary fluvial, lacustrine, and eolian deposits. The PWPG initial 50/50 policy goal to have 50% of saturated thickness remaining in 50 years has been translated for implementation to mean not greater than 1.25% of annual saturated thickness as an available supply. PWPG estimated the available annual water supply from the Ogallala aquifer for each of the counties within the District (PWPA 2006). According to North Plains Groundwater Conservation District's calculations, the estimated total available groundwater in storage is 133,557,835 acre-feet in 2007.

Available annual water supply from the Ogallala aquifer.

County	2010	2020	2030	2040	2050	2060
Dallam	134,586	111,686	93,198	79,073	69,482	62,398
Hansford	254,813	238,659	223,126	208,953	196,618	185,656
Hartley	235,522	208,632	187,439	174,098	165,633	159,922
Hutchinson	37,570	34,602	31,943	29,666	27,897	26,490
Lipscomb	231,577	230,166	228,825	227,628	226,602	225,691
Moore	76,793	61,633	48,260	38,058	30,763	25,362
Ochiltree	235,598	224,443	213,976	204,612	196,557	189,456
Sherman	210,181	177,355	146,356	119,320	97,433	79,883
TOTAL	**1,416,640**	**1,287,176**	**1,173,123**	**1,081,408**	**1,010,985**	**954,858**

Source: PWPA 2006 Regional Water Management Plan - Table 3-2: Available Water Supply from the Ogallala Aquifer

Dockum Aquifer

The Dockum is a minor aquifer that underlies the Ogallala aquifer and extends laterally into parts of West Texas and New Mexico. The primary water-bearing zone in the Dockum Group, commonly called the "Santa Rosa", consists of up to 700 feet of sand and conglomerate interbedded with layers of silt and shale. Domestic use of the Dockum occurs in Oldham, Potter, and Randall counties. The effective recharge rate to the Dockum aquifer is estimated to be 23,500 acre-feet per year and is primarily limited to outcrop areas. Oldham and Potter counties are the main sources of recharge in the PWPA. Differences in chemical makeup of Ogallala and Dockum groundwater indicate that very little leakage (less than 0.188 in/year) occurs into the Dockum from the overlying Ogallala formation. Groundwater availability of the Dockum aquifer is presented below. The availability of water from the Dockum aquifer is estimated to be 1.25% of the total storage estimate plus effective annual recharge (TWDB, 2003).

Available Annual Water Supply from the Dockum Aquifer

County	2010	2020	2030	2040	2050	2060
Dallam	71,800	62,800	54,900	48,100	42,100	36,800
Hartley	69,700	61,000	53,400	46,700	40,900	35,800
Moore	17,400	15,200	13,300	11,600	10,200	8,900
Total	**158,900**	**139,000**	**121,600**	**106,400**	**93,200**	**81,500**

Source: PWPA 2006 Regional Water Management Plan - Table 3-7: Available Annual Water Supply from the Dockum Aquifer

Rita Blanca Aquifer

According to the 2007 Texas State Water Plan, the Rita Blanca is a minor aquifer that underlies the Ogallala Formation and extends into New Mexico, Oklahoma, and Colorado. The portion of the aquifer which underlies the PWPA is located in western Dallam and Hartley counties. Groundwater in the Rita Blanca occurs in sand and gravel formations of the Cretaceous and Jurassic Age. The Romeroville Sandstone of the Dakota Group yields small quantities of water, whereas the Cretaceous Mesa Rica and Lytle Sandstones yield small to large quantities of water. Small quantities of groundwater are also located in the Jurassic Exeter Sandstone and sandy sections of the Morrison Formation.

Recharge to the aquifer occurs by lateral flow from portions of the aquifer system in New Mexico and Colorado and by leakage from the Ogallala. No estimates of recoverable storage, saturated thickness, or other water availability parameters for the aquifer were located for the Rita Blanca aquifer. Supplies from the Rita Blanca were modeled in the Ogallala GAM and these supplies are included in the Ogallala availability numbers.

According to TWDB data, pumping from the Rita Blanca averaged about 5,419 acre-feet per year from 1980 to 1997. Less than 500 acre-feet per year was pumped by the city of Texline for municipal/industrial supply over this time period. An average of 5,343 acre-feet per year was pumped for irrigation supply and an average of 77 acre-feet per year for municipal uses. All pumping occurs in Dallam County, and no pumping of the Rita Blanca is reported for Hartley County. Municipal water well levels in the Rita Blanca aquifer have historically remained stable, whereas irrigation well water levels have declined steadily. This indicates that irrigation usage rates are currently mining the Rita Blanca supply. Insufficient data exist to quantify the rate.

SECTION III - GROUNDWATER MANAGEMENT

The District reviewed key elements in developing its groundwater management plan. These elements are as follows:

A. Managed available groundwater;
B. Estimated annual groundwater use;
C. Estimated annual aquifer recharge;
D. Estimated annual aquifer discharge to springs, lakes, streams, and rivers;
E. Estimated aquifer annual flow volume into and out of the District and annual flow between aquifers;
F. Projected surface water supply; Projected total water demand;
G. Estimated water supply needs; and
H. Recommended water management strategies from the 2007 State Water Plan.

A. Managed Available Groundwater
(31 TAC §356.5(a)(5)(A), §36.1071(e)(3)(A)).

A managed available groundwater amount is calculated by establishing a desired future condition (DFC) of the aquifer and then establishing an amount(s) that can be pumped to achieve that DFC. The DFC of the groundwater within the Groundwater Management Area 1 has not yet been established in accordance with TWC Chapter 36. Therefore, the Managed Available Groundwater for the District is not available from the TWDB.

B. Estimated Annual Groundwater Use
(31 TAC §356.5(a)(5)(B), §36.1071(e)(3)(B)).

In 2006, the District's annual reported groundwater use was 1,198,700 acre-feet (NPGCD Permit Database, 2007). The reported annual water used does not reflect wells that are incapable of producing more than 25,000 gallons of groundwater a day. The District anticipates most of these small wells in the District are used for livestock. The TWDB's most recent estimate for annual livestock use in the eight-county area was 22,635 acre-feet in 2003. Total reported and estimated annual water use within the District for 2006 was 1,221,335 acre-feet. Annual groundwater use is not expected to change significantly over the next five years.

County	Reported Water Use[1]	TWDB Estimated Livestock Use[2]
Dallam	275,066	3,235
Hansford	112,145	3,700
Hartley	303,838	3,835
Hutchinson	37,380	437
Lipscomb	28,513	844
Moore	155,819	4,591
Ochiltree	65,916	2,554
Sherman	220,024	3,434
Total	**1,198,701**	**22,630**

Source: 1. NPGCD Permit Database, 2007 and 2. TWDB estimated historical use (2003).

Based on the number and size of new wells in the District and the District's 2006 reported groundwater use, the District's five-year estimated pumping trend in total groundwater use in acre-feet is shown below.

2002	2003	2004	2005	2006
1,186,757	1,189,732	1,192,713	1,195,703	1,198,700

The TWDB estimated historical groundwater pumping in the District from 1980 through 2003. According to TWDB data, groundwater pumped in the District ranged from 1,545,032 acre-feet to 2,481,011 acre-feet annually. The following table summarizes the estimated TWDB historical groundwater pumping data, in acre-feet, from all aquifers in each county from 1980 through 2003.

Year	Dallam	Hansford	Hartley	Hutchinson	Lipscomb	Moore	Ochiltree	Sherman	Total
1980	328,540	301,309	205,138	89,527	27,980	303,944	130,692	314,766	**1,701,896**
1981	no data	no data	no data	no data	no data	no data	no data	no data	**no data**
1982	no data	no data	no data	no data	no data	no data	no data	no data	**no data**
1983	no data	no data	no data	no data	no data	no data	no data	no data	**no data**
1984	579,382	257,924	222,658	74,442	18,882	303,197	132,568	229,066	**1,818,119**
1985	259,669	228,727	194,525	78,961	9,720	281,444	115,787	248,381	**1,417,214**
1986	293,826	218,395	124,149	61,669	9,109	268,212	112,974	250,172	**1,338,506**
1987	249,050	181,784	116,164	72,391	9,359	291,290	101,487	191,078	**1,212,603**
1988	245,944	186,441	133,216	64,369	17,301	209,184	89,472	201,316	**1,147,243**
1989	290,008	192,045	194,625	57,637	19,136	368,661	83,061	251,963	**1,457,136**
1990	330,971	228,657	176,588	70,886	17,215	378,778	129,597	250,311	**1,583,003**
1991	162,478	262,577	149,964	75,537	16,135	362,826	131,842	262,786	**1,424,145**
1992	216,255	178,200	190,981	79,093	14,996	332,108	87,421	298,995	**1,398,049**
1993	387,077	184,062	161,422	58,720	13,847	362,452	95,414	233,545	**1,496,539**
1994	367,737	183,438	233,533	75,218	18,602	345,803	93,358	272,749	**1,590,438**
1995	399,038	185,881	207,575	76,893	18,833	330,781	88,656	276,869	**1,584,526**
1996	399,494	216,301	228,072	62,835	15,594	374,501	87,693	262,618	**1,647,108**
1997	471,206	226,235	245,147	56,607	11,784	345,946	64,197	276,097	**1,697,219**
1998	415,047	175,062	310,194	65,274	19,117	345,229	56,932	299,531	**1,686,386**
1999	448,524	213,425	375,159	69,493	29,571	292,586	73,863	331,864	**1,834,485**
2000	464,540	219,821	360,336	75,113	37,043	307,501	100,615	397,304	**1,962,273**
2001	416,628	169,022	295,020	65,282	28,559	269,778	67,854	339,783	**1,651,926**
2002	509,628	223,696	393,465	60,372	22,142	336,602	84,638	407,989	**2,038,532**
2003	397,255	224,389	414,251	48,328	22,306	309,140	73,614	361,779	**1,851,062**

Source: TWDB 2007 Water Uses Survey

The TWDB table showing groundwater pumping for each county for the years 1980-2003 is shown above The District anticipates that the TWDB method of calculating groundwater pumping is less accurate that the direct reporting and verification method adopted by the District.

C. Estimated Annual Aquifer Recharge
(31 TAC §356.5(a)(5)(C), §36.1071(e)(3)(C)).

According to the TWDB Groundwater Availability Model (GAM) Run 07-06, the total annual Ogallala aquifer recharge is 85,732 acre-feet from precipitation within the District. The TWDB data is presented in Appendix A. No recharge estimates are provided for the Dockum aquifer.

D. Estimated Annual Aquifer Discharge to Springs, Lakes, Streams and Rivers
(31 TAC §356.5(a)(5)(D), §36.1071(e)(3)(D)).

According to the TWDB GAM Run 07-06, the total estimated annual volume of water that discharges from the Ogallala aquifer to springs and any surface water body including lakes, streams, and rivers is 31,663 acre-feet. The TWDB data is presented in Appendix A.

E. Estimated Aquifer Annual Flow Volume Into and Out of the District and Annual Flow between Aquifers
(31 TAC §356.5(a)(5)(E), §36.1071(e)(3)(E)).

According to the TWDB GAM Run 07-06, the estimated annual Ogallala aquifer flow volume into and flow out of the District as well as the annual volume of flow between the Ogallala aquifer and other aquifers in the District is expressed in acre-feet as follows:

Management Plan Requirement	Aquifer	Results from model simulation (acre-feet)
Estimated annual volume of flow into the district within each aquifer in the district	Ogallala	65,259
Estimated annual volume of flow out of the district within each aquifer in the district	Ogallala	67,455
Estimated annual volume of flow between each aquifer in the district	Ogallala	0

F. Projected Surface Water Supply
(31 TAC §356.5(a)(5)(F), §36.1071(e)(3)(F)).

According to the 2007 State Water Plan estimates of each county associated with the District, the projected surface water supply amounts in acre-feet are as follows:

County	2000	2010	2020	2030	2040	2050	2060
Dallam	757	741	741	741	741	741	741
Hansford	4,222	2,636	2,635	2,633	2,632	2,630	2,630
Hartley	3,027	1,702	1,702	1,702	1,702	1,702	1,702
Hutchinson	2,304	2,434	2,434	2,434	2,434	2,434	2,434
Lipscomb	1,622	723	723	723	723	723	723
Moore	3,258	2,646	2,646	2,646	2,646	2,646	2,646
Ochiltree	2,183	2,506	2,506	2,506	2,506	2,506	2,506
Sherman	1,264	1,137	1,136	1,135	1,133	1,131	1,131
Total	**18,637**	**14,525**	**14,523**	**14,520**	**14,517**	**14,513**	**14,513**

Source: Volume 3, 2007 State Water Planning Database

G. Projected Total Water Demand (31 TAC §356.5(a)(5)(G), §36.1071(e)(3)(G)).

According to the 2007 State Water Plan and based on the TWDB estimated land area and the District estimates based on the percent of each county within the District, the projected total water demand in acre-feet is as follows:

County	2000	2010	2020	2030	2040	2050	2060
Dallam	241,601	240,373	239,066	227,495	204,088	180,646	168,979
Hansford	144,411	141,563	138,664	132,111	118,664	105,200	98,670
Hartley	250,185	246,862	243,428	231,378	207,032	182,684	170,606
Hutchinson	25,902	26,507	26,653	26,156	24,697	23,158	22,794
Lipscomb	16,359	16,093	15,872	15,133	13,657	12,191	11,448
Moore	136,462	134,816	133,356	127,949	116,207	104,313	98,828
Ochiltree	110,783	108,494	106,327	101,404	91,236	81,033	76,067
Sherman	298,495	299,079	297,604	283,100	253,874	224,658	210,178
Total	**1,224,198**	**1,213,787**	**1,200,970**	**1,144,726**	**1,029,455**	**913,883**	**857,570**

Source: Volume 3, 2007 State Water Planning Database

H. Estimated Water Supply Needs (31 TAC §356.5(a)(7), §36.1071(e)(4)).

According to the 2007 State Water Plan, the estimated water supply needs in acre-feet are as follows:

County	2010	2020	2030	2040	2050	2060
Dallam	-130,403	-159,712	-169,102	-156,508	-137,713	-131,493
Hansford	0	0	0	0	0	0
Hartley	-16,646	-38,395	-106,109	-132,397	-143,690	-141,822
Hutchinson	-9,274	-19,673	-25,348	-34,538	-38,518	-46,362
Lipscomb	0	0	0	0	0	0
Moore	-66,455	-86,314	-98,641	-98,116	-92,843	-93,931
Ochiltree	0	0	0	0	0	0
Sherman	-87,776	-119,127	-135,622	-133,434	-126,106	-129,175

Source: Volume 3, 2007 State Water Planning Database

I. Recommended Water Management Strategies from the 2007 State Water Plan (31 TAC §356.5(a)(7), §36.1071(e)(4)).

To meet the long-term water supply needs of the District, the 2007 State Water Plan recommends eight water management strategies. Those management strategies and the county that they would be applicable to are as follows:

Management Strategy	Dallam	Hansford	Hartley	Hutchinson	Lipscomb	Moore	Ochiltree	Sherman
Drill Additional Groundwater Wells				●				
Irrigation Conservation	●	●	●	●	●	●	●	●
Manufacturing Conservation				●		●		
Municipal Conservation	●		●			●		●
Overdraft Aquifer	●		●			●		●
Palo Duro Reservoir						●		
Reuse				●		●		
Voluntary Transfer from Other Users.	●		●			●		●

Source: Volume 3, 2007 State Water Planning Database

Drilling Additional Groundwater Wells – Drilling additional wells is listed as a management strategy for Manufacturing Water User Group (WUG) in Hutchinson County.

Irrigation Conservation – Irrigation conservation is an agricultural water conservation strategy recommended in all eight counties and is the water management strategy that will have the greatest impact in meeting water needs. Irrigation conservation includes:

1) Irrigation water use management strategies particularly with advanced irrigation systems, such as irrigation scheduling, volumetric measurement of water use, crop residue management, conservation tillage, and on-farm irrigation audits;
2) Land management systems, including furrow dikes, land leveling, conversion from irrigated to dry land farming, and brush control/management;
3) On-farm delivery systems, such as lining of farm ditches, low pressure center pivot sprinkler systems, drip/micro irrigation systems, surge flow irrigation, and linear movement sprinkler systems;
4) Water delivery systems, including lining of irrigation canals and replacing lateral canals with pipelines;
5) Miscellaneous systems, such as water recovery and reuse; and
6) Water conservation technologies for other agricultural sectors, including CAFOs, food processing operations, slaughter facilities, etc. and alternative energy production.

The agricultural water conservation strategies recommended by the PWPG also include the use of the North Plains Evapotranspiration Network to schedule irrigation, irrigation equipment efficiency improvements, implementation of conservation tillage methods and precipitation enhancement.

Manufacturing Conservation – Manufacturing conservation strategies are recommended for Hutchinson and Moore Counties. Conservation strategies to reduce manufacturing water use are typically industry and process-specific and cannot be specified to meet county-wide needs.

Municipal Conservation – Municipal conservation management strategies are recommended by the PWPG for Dallam, Hartley, Moore and Sherman counties. The municipal conservation measures considered include the implementation of water efficient clothes washers for current populations, education and public awareness programs, reduction of unaccounted for water through water audits and system maintenance, and water rate structures that discourage water waste.

Overdraft Aquifer – Overdrafting the Ogallala aquifer is recommended by the PWPA for municipal and public water supplies to continue to produce water in Dallam, Hartley, Moore and Sherman counties even if total pumping in those counties exceeds the PWPA 1.25% policy.

Palo Duro Reservoir- Palo Duro Lake Reservoir is listed as a recommended water management strategy to meet the future public water supply needs of the City of Cactus, the City of Sunray and the City of Dumas in Moore County. The plan contemplates that by 2030 the reservoir could supply 3,500 acre-feet of water and by 2060, 4,000 acre-feet of water to these cities. The Palo Duro Lake Reservoir is located in Hansford County and is operated by the Palo Duro River Authority.

Reuse - Wastewater reuse is a more general strategy that can be utilized by various industries for process water. This strategy requires a source (municipal water users with treated effluent), sufficient quantity and industrial processes that can utilize non-potable water.

Voluntary Transfer from Other Users - Voluntary transfer of water or water rights from other users is recommended by the 2007 State Water Plan as a management strategy for the livestock users group.

According to the 2007 State Water Plan, if the above listed management strategies are fully implemented, the water savings in acre-feet is as follows:

County	2010	2020	2030	2040	2050	2060
Dallam	26,400	36,784	43,953	50,590	56,724	61,606
Hansford	9,918	12,723	15,528	18,333	21,138	23,148
Hartley	17,778	23,876	29,564	34,624	39,384	43,159
Hutchinson	8,206	12,518	19,932	21,244	26,158	27,087
Lipscomb	1,027	1,313	1,600	1,886	2,173	2,383
Moore	21,265	26,786	35,987	42,712	47,856	51,327
Ochiltree	7,631	9,756	11,880	14,004	16,128	17,647
Sherman	23,009	32,041	39,066	45,472	51,877	57,123
TOTAL	**115,234**	**155,797**	**197,510**	**228,865**	**261,438**	**283,480**

Source: Volume 3, 2007 State Water Planning Database

SECTION IV - GROUNDWATER MANAGEMENT GOALS, METHODOLOGY, MANAGEMENT OBJECTIVES, AND PERFORMANCE STANDARDS.

A. Actions, Procedures, Performance and Avoidance for Plan Implementation.

The District will implement and utilize the provisions of this management plan for determining the direction or priority for all District activities. District operations, all agreements entered into by the District, and any additional planning efforts in which the District may participate will be consistent with the provisions of this plan. The District shall attempt to treat all citizens fairly. The District, as needed, shall seek the cooperation of state, regional, and local water management entities in the implementation of this plan and/or management of groundwater supplies within the District. A current copy of the District Rules is located on the District's website www.npwd.org.

B. Measurement of Success in Achieving Management Goals.

District Staff will prepare an annual written report outlining the District's performance in achieving its management goals. This report will offer responses to the performance standards listed following each management objective. This report will be presented to the District's Board of Directors in a timely manner, taking into consideration seasonal workloads and events, such as legislative sessions. The District will continue to enforce its rules to conserve, preserve, protect, and prevent the waste of the groundwater resources under its jurisdiction. The District's Board periodically reviews the District's Rules and makes revisions as needed to manage the groundwater resources within the District pursuant to TWC Chapter 36. The District's Board will consider all groundwater uses and needs and will develop rules which are fair and impartial to implement this management plan.

GOAL: PROVIDING THE MOST EFFICIENT USE OF GROUNDWATER (31TAC §356.5(A)(1)).

To encourage the most efficient use of groundwater, the District uses a combination of research-proven science-based water management strategies to manage the production of water from water wells. These strategies will include implementation of the 2006 PWPG Regional Water Plan for the PWPA. The District will implement rules that manage the amount of groundwater that a groundwater rights owner can withdraw during a production period from the Ogallala aquifer. Based on the hydrologic conditions of the aquifer, the District may limit: well production, the amount of water produced according to acreage or tract size, the amount of water that may be produced from a defined number of acres, the maximum amount of water that may be produced on the basis of acre-feet per acre and gallons per minute per acre, and the total acre-feet per acre that may be produced during a specified production period. The District will continue to require all owners to install flow meters on each non-exempt and non-domestic well in use, require groundwater use reporting from owners of wells capable of producing more than 25,000 gallons of groundwater a day, and establish spacing requirements for all new wells. The District will continue to require permits prior to drilling any non-exempt and non-domestic well and will continue to require all wells to be registered. As an integral part of promoting the most efficient use of groundwater, the District will continue to maintain a water level observation network to monitor water quality and the water volume in storage in the Ogallala aquifer within the District. Other programs will continue to be in operation to help users conserve the Ogallala aquifer. All of the District's programs will continue to be designed to conserve the resource while maintaining the economic viability of the area.

Management Objective: The District will evaluate its requirement that all new wells be properly spaced and comply with well density standards.

The District will evaluate the effectiveness of its requirement that all new wells be properly spaced and comply with well density standards in providing the most efficient use of groundwater. Currently, the District requires 100% of new wells to be spaced from property lines and other wells based on the production capacity of the well in gallons per minute (gpm) under normal operating conditions. Pump column size, bowl size or casing size is not considered when determining the pumping capacity; however, the casing size must be of a sufficient diameter to accommodate a pump column size and bowl size for the production capacity proposed. The maximum production from any single well will not exceed 1,800 gpm. Currently the District requires well spacing as follows:

Pumping Capacity of Proposed Well (GPM)	Classification of Proposed Well	Minimum Distance From Nearest Well or Authorized Well Site	Minimum Distance from Property Line
18 – 100 GPM	A	150 Yards	100 Yards
101 – 400 GPM	B	250 Yards	100 Yards
401 – 800 GPM	C	400 Yards	100 Yards
801 – 1,800 GPM	D	500 Yards	100 Yards

Performance Standards:

A. The District will review the effectiveness of its current spacing requirements by January 1, 2009.
B. The District will propose any recommended changes regarding its spacing requirements by January 1, 2010.

Management Objective: Limit groundwater withdrawal amounts based on an allowable production limitation and a contiguous water right acres limitation.

The District's objective is to limit all non-domestic and non-exempt groundwater user's groundwater withdrawals from wells which are capable of producing more than 25,000 gallons of groundwater a day. Currently, the District sets a maximum allowable production limit of two (2) acre-feet per acre per-annum on water rights tracts not to exceed 1600 acres. The District plans to consider a multi-year production period beginning January 1, 2009 wherein production will be limited during such production period based upon the number of acres of contiguous water rights owned not to exceed 1600 acres. The per-acre per-annum production limitation during a production period will be set by the Board based upon the District staff's recommendations of the conditions of the aquifer, the Desired Future Conditions as ultimately established by GMA 1, sound science, current and future socio-economic impacts reasonably expected to occur, environmental impacts, state policy and legislative directives and any other related data. The combination of the allowable production limitation and the contiguous water right acres pooling limitation restricts a producer owning a large number of acres (1600 acres, or more) with low groundwater production capacity from using those acres with low production capacity to produce unreasonable volumes of groundwater from a relatively small area.

The District's Board will consider all current and future known groundwater uses and needs and will develop rules which are fair and impartial to implement this management objective. In this regard, water rights owners within the District shall be provided with the current allowable production rate for their area at the time a well permit is requested and the production rate for all properties within an area shall be the same.

Performance Standards:

A. The District will notify water right owners with wells of their allowable production for the production period before the beginning of the production period.
B. Annually, the District will provide the proper production notice form to the well owner or the owner's authorized representative.
C. Annually, the District will collect production reports from all well owners or their authorized representatives.
D. Annually, the District staff will report groundwater production to the District's Board by June 1st following the reporting year.
E. By December 31st following the reporting year, the District will compare annual groundwater production and annual volume decline rates.

F. The District will maintain documentation in its files regarding the size and legal description of each producing tract of contiguous acres of water rights.
G. By June 1st following the reporting year, the District will compare the reported production for each producing property with the allowable production limitation for that property.
H. By July 1st following the reporting year, the District will begin compliance proceedings against those water right owners that exceed the allowable production limitation. The District will use all remedies provided by the Texas Water Code and other state statutes, as necessary, to gain compliance with the District's allowable production limit rules, as well as other rules promulgated by the District.
I. By January 1, 2010, the District will investigate the potential of developing an allowable production guarantee to address future rights to produce groundwater for new and existing water rights owners.

Management Objective: Analyze the current and future socio-economic impacts to water rights owners in the District regarding scheduled reductions of the allowable production limit to promote conservation.

For any production period, the District plans to set any production limitation based upon a per-acre per-annum limit and upon the contiguous water right acres owned. The District will review its allowable production limit and its contiguous water right acres limit. The District will determine the amount that the production limit may be reduced and the contiguous water rights acres pooling limit may be modified to promote conservation. The District will use sound science, current and future socio-economic impacts reasonably expected to occur, environmental impacts, state policy and legislative directives. Any proposed schedule for reductions will be noticed for public hearing. Once the District's Board has given the public opportunity to provide comment, the District's Board will consider setting a schedule for reduction of allowable production limits by rule to promote conservation. If the District's Board sets a schedule for allowable production limit reductions or modification of the contiguous water rights acres limit, all water rights owners will be given appropriate time to adjust their pumping to comply with the revision.

If the volume of the aquifer declines at a rate over a production period that jeopardizes the District's management standard, the District may:

- Review its allowable production limit and its contiguous water rights limit;
- Review its allowable production limit reduction schedule, if set;
- Provide a warning to water rights owners that unless voluntary reductions are achieved the District may reduce the allowable production or modify the contiguous water rights acres limit; and
- After public hearing, set a new allowable production limit or new contiguous water rights limit which shall be based on sound science, socio-economic impacts reasonably expected to occur, environmental impacts, state policy and legislative directives, and any other relevant information.

Any new proposed allowable production limit or new contiguous water rights limit will be noticed for public hearing. Once the District's Board has given the public opportunity to provide

comment, the District's Board will consider revising the allowable production limit or the contiguous water rights limit. If the District's Board sets a new allowable production limit or a new contiguous water rights limit, all water rights owners will be given appropriate time to adjust their pumping to comply with the revision.

Performance Standards:

A. By June 30, 2008, the District will develop a scope of work for a study to analyze the current and future socio-economic impacts to all water rights owners of scheduled reductions in allowable production limits or modification of contiguous water rights acres limits.
B. By August 1, 2008, the District will initiate a study with appropriate scientific, local, state and federal organizations.
C. By December 31, 2009, the District will review final results of the study.
D. By December 31, 2010, the District may propose scheduled reductions of the allowable production limit and/or modification of the contiguous water rights limit into the management plan and rules for the District Board's consideration.

Management Objective: Accurately measure groundwater withdrawal through the installation of water well flow meters on each non-exempt and non-domestic well.

The District's objective is to know the total volume of water being withdrawn from the aquifer on an annual basis. The District will accomplish this objective by requiring all non-exempt or non-domestic wells to be equipped with an approved water well flow measurement device.

Performance Standards:

A. By December 31, 2010, the District will inspect 100% of wells that are required to have a water well flow meter or alternative metering method.
B. Annually, the District will verify that 100% of newly permitted wells are equipped with the proper flow meter.
C. The District will provide "Metering and Production Reporting Manual" in the District office and on the District website to assist water producers in determining metering methods and in reporting annual production.
D. The District will update the District's database when a new flow meter is installed within five business days of notification by the owner.
E. The District will place meter registration forms in well files upon receipt and data entry.

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

The District's objective is to calculate total annual volume of groundwater withdrawals through water use reporting by all owners of non-exempt or non-domestic wells to report the well's annual groundwater withdrawals on a form authorized by the District.

Performance Standards:

A. Annually, the District will issue allowable production reporting forms to each well owner required to report their production.
B. The District will require all permitted well owners or their authorized representative to file the production reports on a timely basis.
C. Annually, District staff will report water rights owners who have exceeded their groundwater production limits to the District's Board.
D. Annually, District staff will report owners who have failed to provide the production reports to the District's Board.
E. The District staff will document water rights owners who have exceeded their groundwater production limits.
F. By June 1st of each year, District staff will report annual groundwater withdrawals to the District's Board.

Management Objective: Track the location and disposition of all domestic, livestock and rig supply water wells within the District.

The District's objective is to track the location and disposition of all domestic, livestock, and rig supply water wells.

Performance Standards:

A. Annually, District staff will electronically file well registrations into the District database and maintain hard copies in files.
B. Within three business days of receiving water well registration forms, District staff will verify the location of the proposed well site in accordance with District Rules including, but not limited to, spacing.
C. District staff will perform on-site inspections of 100% of wells for which District staff have reason to question compliance with District rules.
D. District staff will document in the District files a field report for each inspection.
E. District staff will document in the District files all letters mailed to permit applicants requesting additional information or changes needed to comply with District rules.
F. District staff will maintain in the District files all follow-up letters as needed.
G. By December 31st of each year, District staff will document the number of incomplete registrations.

Management Objective: Track the location and disposition of all non-exempt water wells capable of producing more than 25,000 gallons of groundwater a day.

The District's objective is to track the location and disposition of all non-exempt water wells capable of producing more than 25,000 gallons of groundwater a day by issuing water well drilling permits for all water wells.

Performance Standards:

A. District staff will report the number of permits issued each quarter to the District's Board and in the North Plains Water News.
B. The District will require each land owner or their authorized agent to fill out a permit application developed by the District.
C. District staff will keep copies of permits electronically and hard copies in a District file.
D. District staff will verify the location of the proposed well site in accordance with District Rules including but not limited to spacing within three business days after receiving the well permit application.
E. District staff will perform on-site inspections of 100% of new wells once all documentation is received and reviewed by the District.
F. District staff will maintain in the District files a field report for each well field inspected.
G. After inspection and well is complete, District staff will submit the permit to the District's Board for final approval.
H. District staff will maintain in the District files all letters mailed to permit applicants requesting additional information or changes needed to comply with District rules.
I. District staff will maintain in the District files all follow-up letters.
J. The District will document the number of cases still open at year-end.
K. Annually, District staff will plot the location of all newly permitted wells using the latest in-house technologies.

Management Objective: Conduct groundwater level monitoring program.

The District will continue to monitor the volume of available groundwater by maintaining a network of approximately 506 observation wells within the District's jurisdiction.

Performance Standards:

A. Annually, District staff will measure the depth-to-water below land surface in each well in the observation well network in which it is possible to measure and record the depth-to-water.
B. The District will maintain approximately the same number of wells in the observation well network each year by locating replacements for wells which can no longer be measured and obtain the owner's permission to use the well for annual measurement.
C. Annually, the District will drill and/or equip at least ten observation wells that are used solely for data collection.
D. Within 10 business days after collecting the data, District staff will enter the water well measurements into the District's database.
E. By December 31st, District staff will compare measurements to previous year's measurement and calculate the water level rise or decline in each well for the past year, the past 5 years and the past 10 years.
F. Annually, the District will publish data from annual measurements and comparisons to previous year, previous 5-year period, and previous 10-year period through the North Plains Water News and news releases to print and electronic media within the District.
G. Annually, the District will update depth-to-water income tax depletion allowance database and supply data to landowners.
H. Annually, the District will publish at least one article regarding the groundwater level monitoring program in the North Plains Water News.

Management Objective: Provide pump tests and pump plant efficiency tests to provide water users with needed information to better manage their water.

Performance Standards:

A. District staff will perform field tests such as gallons-per-minute flow tests, pumping level measurements, pump speed, and system pressure tests upon request.
B. District staff will continue to provide Pump Plant Efficiency Tests as requested to determine any inefficiencies so that water producers can make corrections to improve the efficiency of water production.
C. Annually, District staff will report to the District's Board the number and type of testing services provided to the District residents.
D. District staff will maintain records in District files of all field tests performed by the District.

Management Objective: Update, publish and distribute hydrologic maps.

The District publishes hydrologic maps to inform the community about aquifer conditions on a District-wide and local basis. The maps allow the comparison of saturated material, depth to water and annual declines on District wide and localized areas. The maps provide producers information to monitor the saturated material, depth to water and annual declines of their properties. Interested parties use the maps to estimate depth to water, depth to base of the aquifer and to make an initial assessment of potential well locations, to estimate fuel usage of potential new wells, and to estimate long term viability of water production in an area.

At regular intervals, the District will continue to construct and publish hydrologic maps and charts for public review. The maps will depict the approximate elevations of the base of the Ogallala, the water table of the Ogallala, the approximate land surface, and the approximate saturated thickness of the Ogallala Formation.

Performance Standards:

A. Annually, District staff will measure the depth-to-water from the land surface to the water table from at least 70% of the District's observation wells and other available wells.
B. Annually, District staff will update the District database for each water level measurement.
C. Annually, District staff will update District maps regarding depth to water, depth to red bed, and aquifer saturated thickness in the District.
D. Within 30 days of completion, District staff will publish the updated maps on the District's web site.
E. Annually, the District will publish IRS Depletion information maps.
F. Annually, the District will publish an up-to-date water quantity report to the general public.

GOAL: CONTROLLING AND PREVENTING THE WASTE OF GROUNDWATER (31TAC §356.5(A)(1)(B)).

Texas Water Code Chapter 36 defines Waste as any one of the following:

A. withdrawal of groundwater from a groundwater reservoir at a rate and in an amount that causes or threatens to cause intrusion into the reservoir of water unsuitable for agricultural, gardening, domestic, or stock raising purposes;
B. the flowing or producing of wells from a groundwater reservoir if the water produced is not used for a beneficial purpose;
C. escape of groundwater from a groundwater reservoir to any other reservoir or geologic strata that does not contain groundwater;
D. pollution or harmful alteration of groundwater in a groundwater reservoir by saltwater or by other deleterious matter admitted from another stratum or from the surface of the ground;
E. willfully or negligently causing, suffering, or allowing groundwater to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road, or road ditch, or onto any land other than that of the owner of the well unless such discharge is authorized by permit, rule, or order issued by the commission under Chapter 26;
F. groundwater pumped for irrigation that escapes as irrigation tailwater onto land other than that of the owner of the well unless permission has been granted by the occupant of the land receiving the discharge; or
G. for water produced from an artesian well, "waste" has the meaning assigned by Section 11.205.

The District prohibits the production of groundwater within the District in such a manner or under such conditions as to constitute waste as defined by the TWC. The District implements programs to educate the public regarding controlling and preventing the waste of groundwater and develops rules that are fair and impartial to all water producers.

Management Objective: Control and prevent waste of groundwater through education and mitigation.

The District controls and prevents waste through education and mitigation.

Performance Standards:

A. Annually, District staff will create at least one brochure regarding controlling and preventing the waste of groundwater at the District offices for public distribution.
B. Annually, District staff will publish at least one article in the North Plains Water News regarding controlling and preventing waste.
C. Within sixty days of publication, District staff will provide a copy of the article to the District's Board.
D. Within two days after receiving a groundwater waste complaint, District staff will document all complaints received by the District with photographs and written reports.

E. Within five days after the complaint, District staff will notify the well owner/operator of the alleged violation for the owner to eliminate the waste.
F. Within 10 days after notice, District staff will follow-up with the well owner/operator to determine if the waste has been eliminated.
G. Annually, District staff will report the number of waste occurrences to the District's Board.

Management Objective: Promote beneficial use of groundwater through research and education.

North Plains Groundwater Conservation District will continue to promote education of the public at all age levels through programs targeted at a wide variety of audiences. A continuing practice will be working with water users within the District and showing them the value and savings gained by adapting to more water conserving methods of applying, using and re-using water. The District will continue to develop and use various methods to encourage more efficient use of water.

Performance Standards:

A. In each quarterly edition of the North Plains Water News, the District will publish at least one article regarding water conservation and protection.
B. Annually, the District will publish a water conservation calendar which promotes water conservation through the artwork contest for the calendar and as the calendars are used throughout the year.
C. The District will maintain a website which contains current information about the Ogallala aquifer, the District, and the services provided by the District.
D. Each quarter, District will report to the District's Board the number of public education programs the District has provided or helped provide.
E. The District will continue to provide at least two yearly Water Festivals to educate the youth of the District about their water resources and water conservation.

GOAL: CONTROLLING AND PREVENTING SUBSIDENCE (31TAC §356.5(A)(1)(C)).

Due to the depth to water and the nature of the geology of the aquifer within the District, subsidence is unlikely and the District's Board of Directors, upon recommendation from the staff, has determined that this goal is not applicable to the District.

GOAL: CONJUNCTIVE SURFACE WATER MANAGEMENT ISSUES (31TAC §356.5(A)(1)(D)).

According to the 2007 State Water Plan, Palo Duro Lake Reservoir is listed as a recommended water management strategy to meet the future public water supply need of the City of Cactus, the City of Sunray and the City of Dumas in Moore County. The plan contemplates that by 2030 the reservoir could supply 3,500 acre-feet of water and by 2060, 4,000 acre-feet of water to these cities. The Palo Duro Lake Reservoir is located in Hansford County and operated by the Palo Duro River Authority.

Following notice and hearing, the District coordinated in the development of this management plan with surface water management entities as required by 31 TAC §356.6(a)(4). Documentation regarding this coordination effort is located in Appendix C. The District also coordinated in the development of this plan with the Panhandle Regional Planning group, as referenced in Appendix B.

The District's Board of Directors, upon recommendation from the staff and based on coordination with surface water management entities, has determined that this goal is not applicable to the District during this planning period which ends before the surface water supply operated by the Palo Duro River Authority will be available for municipal use. The District looks forward to working with the Palo Duro River Authority and other surface water suppliers to maximize the conjunctive use of groundwater in the District in the future.

GOAL: NATURAL RESOURCE ISSUES THAT IMPACT THE USE AND AVAILABILITY OF GROUNDWATER AND WHICH ARE IMPACTED BY THE USE OF GROUNDWATER (31TAC §356.5(A)(1)(E)).

To protect the Ogallala aquifer, the District adopted rules in 2005 that included Chapter 6 Water Quality and Waste. Under this chapter, the rules incorporated several resolutions and directives of the District's Board which had been adopted in the past as water quality issues arose. The position of the District is that the State of Texas and the federal government have regulatory agencies to protect the groundwater and surface water from both point source and non-point source pollution. The North Plains Groundwater Conservation District has in the past, and intends to continue, to work with the other agencies created by the state of Texas and the federal government to protect the groundwater within the District from pollution.

Management Objective: Assist well owners with water quality testing.

The District will continue to operate a water quality laboratory in the main office in Dumas. Limited water quality laboratory services will be available to all residents of the District upon request. The District will also continue to maintain a network of wells for monitoring water quality.

Performance Standards:

A. Annually, District staff will collect and analyze water samples from one-fifth of the District's water quality monitoring wells or approximately 110 water samples across the District and enter those results into the District water quality database.
B. The District will maintain a water quality observation well network to provide adequate information to determine any change in the water quality within the District in time to seek remedial or corrective action.
C. Annually, District staff will provide at least one article regarding water quality testing in the North Plains Water News.
D. Annually, District staff will present a report on any noted changes in water quality within the District to the District's Board.
E. Within two business days after a request is received by the District, District staff will collect samples for analysis.
F. District staff will perform mineral or bacterial analyses of water samples as requested by residents of the District.

Management Objective: Protect the quality of the aquifer through Check Valve Program and requirements.

The District will continue to require positive seal check valves on all District water wells to try to ensure that contaminants and/or chemicals are not allowed to flow back down into wells and cause contamination of the aquifer.

Performance Standards:

A. As part of each routine new well or meter inspection, District staff will verify that a proper check valve is installed on a permitted well.
B. District staff will document improperly installed check valves and notify the owner within five business days.
C. District staff will update check-valve information within five days of the inspection in the District's database.
D. By January 1, 2010, the District will complete a check-valve installation program in the former Dallam County Underground Water Conservation District that was annexed into North Plains Groundwater Conservation District.
E. Annually, District staff will report the status of the check valve program and the number of inspections to the District's Board.

GOAL: ADDRESSING DROUGHT CONDITIONS (31TAC §356.5(A)(1)(F)).

North Plains Groundwater Conservation District lies in an area of the state of Texas that has a year-round semi-arid climate. Semi-drought conditions are experienced year round, and the District works to educate the public about methods to conserve water all year, but particularly during dry periods.

Management Objective: Provide Public Information regarding Xeriscape and Drip Irrigation to address drought conditions.

Performance Standards:

A. Annually, the District will offer and sponsor a xeriscape and drip irrigation class to the public.
B. Annually, the District will make available to the public, both at xeriscape classes, in the District office, and at public presentations, at least one piece of literature and information on the advantages of using native, drought tolerant plants and drip irrigation in the landscape.
C. District staff will publish at least one article in the North Plains Water News regarding xeriscape and drip irrigation per year.
D. District staff will provide a copy of the article or advertisement to the District's Board within sixty days of publication.

Management Objective: Continue supporting water conservation research addressing drought conditions with Texas AgriLife Research.

Performance Standards:

A. Annually, the District will review research addressing drought conditions with Texas AgriLife Research at the District's Research Field.
B. The District will make available to the public, in the District offices and on the District's website, research supported by the District and other agencies addressing drought conditions
C. District staff will publish at least one article in the North Plains Water News per year regarding research addressing drought conditions.
D. District staff will provide a copy of the article or advertisement to the District's Board within sixty days of publication.

GOAL: WATER CONSERVATION, RECHARGE ENHANCEMENT, RAINWATER HARVESTING, PRECIPITATION ENHANCEMENT, OR BRUSH CONTROL, WHERE APPROPRIATE AND COST-EFFECTIVE (31TAC §356.5(A)(1)(G)).

Water Conservation.

The District defines water conservation as any beneficial reduction in water loss, waste, or use; reduction in water use accomplished by implementation of water conservation or water efficiency measures; and improved water management practices that reduce or enhance the beneficial use of water. A water conservation measure is an action, behavioral change, device, technology, or improved design or process implemented to reduce water loss, waste, or use. Water efficiency is a tool of water conservation that results in more efficient water use and thus reduces water demand. The value and cost-effectiveness of a water efficiency measure must be evaluated in relation to its effects on the use and cost of other natural resources.

Since 1961, the District has worked closely with the Texas Agricultural Experiment Station, an agency of the Texas A&M System. Today, the District works closely with Texas AgriLife Research (formerly the Texas Agricultural Experiment Station) in the operation of the District's North Plains Research Field. The District will continue to operate the Research Field to provide the farmers and ranchers of the region with the best research in water conservation methods. These include application rates, crop adaptation, conservation tillage, sprinkler systems, and drip irrigation. Texas AgriLife Research uses the Research Field to conduct experiments in crop genetics by developing new plant varieties that are more drought tolerant and require less water while maintaining optimum yields. In addition to genetic research, Texas AgriLife Research performs experiments in the use of herbicides, insecticides, and pesticides in irrigated as well as dry land agriculture. The Research Field demonstrates the water saving and other conservation methods to public and private entities, other researchers and farmers and ranchers in the form of field days, periodicals, journals and other media. Since the Research Field is operated by the District and Texas AgriLife Research, visitors are welcome at any time to view the demonstrations, seek conservation research information and discuss the new conservation research conducted at the Research Field.

In addition to the District's support of research at the North Plains Research Field, the District will continue to actively participant in the Panhandle Water Planning Area (PWPA) planning process. The planning process provides conservation strategies for reducing demand on groundwater and surface water resources in the region that are incorporated into the 2007 State Water Plan. The District reviewed the 2007 State Water Plan. The District plans to incorporate a substantial number of the recommendations into the District's management plan.

Lastly, the District will be participating in the Ogallala Aquifer Project as part of the Industry Review Committee for Modeling the Economic Impacts of Water Conservation Policy. The overall objective of the study is to provide policy makers and other interested individuals an analysis with the estimated impacts of alternative water conservation policies. The District will use the results of the study to evaluate its water conservation policies and rules and procedures.

Management Objective: Maintain current partnership with Texas AgriLife Research to promote research in agricultural water conservation.

The District plans to continue to partner with Texas AgriLife Research of the Texas A&M System to conduct research and educate the public through the North Plains Research Field. The District provides support for research & demonstration projects to conserve water in agriculture including application rates, crop genetics, crop adaptation, conservation tillage, various sprinkler system demonstrations and evaluations, and better water use through the development of new technology.

Performance Standards:

A. The District will present information on water conservation research and results to the public through written reports and field demonstrations.
B. Annually, District staff will report to the District's Board the activities at the Research Field.
C. Annually, the District will publish at least one article in the North Plains Water News regarding water conservation research at the Research Field.
D. District staff will provide a copy of the article or advertisement to the District's Board within sixty days of publication.

Management Objective: Implement the eight water management strategies recommended by the 2007 State Water Plan.

The District will review the 2007 State Water Plan water management strategies to address the long term water supply needs of the District and determine whether these management strategies require additional rules. These water management strategies include: drilling additional groundwater wells, irrigation conservation, manufacturing conservation, municipal conservation, overdraft of the aquifer, Palo Duro Reservoir, reuse, and voluntary transfer of water from other users.

Performance Standards:

A. By December 31, 2008, the District will create municipal, manufacturing and agricultural stakeholder water user groups to develop plan criteria;
B. By December 31, 2009, the District will develop a plan to implement best management practices regarding water conservation throughout the District.
C. Annually, District staff will report to the District's Board regarding implementation of the plan and plan progress.

Management Objective: Participate in the Ogallala Aquifer Project as part of the Industry Review Committee for Modeling the Economic Impacts of Water Conservation Policy.

The results of the study will be used by the District to evaluate its policies, rules and procedures regarding water conservation and groundwater withdrawals in the District.

Performance Standards:

A. By December 31, 2009, the District will review final results of the study.
B. By December 31, 2010, District staff will evaluate the study results and recommend amendments to the District's groundwater management plan to the District's Board.
C. By December 31, 2012, District staff will incorporate any recommendations by the committee into the management plan and rules for the District's Board consideration.

Recharge Enhancement.

The District has limited surface water resources to effectuate enhanced recharge through diversion or infiltration of surface water. The District explored recharge enhancement through its precipitation enhancement program. The District discontinued its funding for the precipitation enhancement program in 2007. The District could not quantify if, and to what extent, the program positively affected precipitation and subsequent recharge in the District. Therefore, recharge enhancement through surface water diversion or infiltration, or through precipitation enhancement could not be proven to be effective for the District. The District has determined that this objective is not applicable at this time.

Rainwater Harvesting.

Management Objective: Provide the Public Information regarding Rainwater Harvesting.

The District will provide rainwater harvesting information to the public through the North Plains Water News, through newspaper articles of general circulation and through brochures in the District's offices.

Performance Standards:

A. The District will maintain rainwater harvesting literature in the District offices.
B. Annually, the District will submit one article or advertisement regarding rainwater harvesting for publication in the North Plains Water News or a newspaper of general circulation within the District.
C. District staff will provide a copy of the article or advertisement to the District's Board within sixty days of publication.

Precipitation Enhancement.

The District discontinued its funding for precipitation enhancement program in 2007. The District could not quantify if, and to what extent, the program positively affected precipitation. Therefore, precipitation enhancement could not be proven to be cost-effective for the District. The District has determined that this objective is not applicable at this time.

Brush Control.

Management Objective: Provide the Public Information regarding Brush Control.
The District will provide brush control information to the public through the North Plains Water News, through newspaper articles of general circulation, and through brochures in the District's offices.

Performance Standards:

A. Maintain brush control literature in the District offices.
B. Annually submit one article or advertisement regarding brush control for publication in the North Plains Water News or a newspaper of general circulation within the District.
C. Provide a copy of the article or advertisement to the District's Board within sixty days of publication.

GOAL: DESIRED FUTURE CONDITIONS (DFC) OF THE GROUNDWATER RESOURCES (31TAC§356.5(A)(1)(H)).

The Texas Water Plan requires that Groundwater Conservation Districts "develop a comprehensive management plan that addresses in a quantitative manner, the desired future conditions of the groundwater resources." The Texas legislature created Groundwater Management Areas to ensure more regional cooperation and planning between different groundwater conservation districts. The Groundwater Management Area boundaries are intended to coincide as closely as possible with the boundaries of a shared groundwater resource, in this case the sub basins of the Ogallala aquifer.

In establishing the Desired Future Conditions, the groundwater conservations districts in GMA 1 shall consider uses or conditions of an aquifer within the management area that differ substantially from one geographic area to another. The districts may establish different desired future conditions for each aquifer, subdivision of an aquifer, or geologic strata, or each geographic area overlying an aquifer in whole or in part, or subdivision of an aquifer within the boundaries of the GMA 1.

The District is located within Groundwater Management Area 1 (GMA 1), that also includes Panhandle Groundwater Conservation District, Hemphill Underground Water Conservation District, and parts of the High Plains Groundwater Conservation District. The District participates as an active member of GMA 1 and is committed to achieving the GMA 1 goal of setting a Desired Future Condition (DFC) for the aquifer and/or each of the aquifer's sub-basins in the area.

At this time the DFC for GMA 1 has not been determined. Therefore, this management goal is not applicable at this time.

GOAL: OTHER MANAGEMENT GOALS INCLUDED IN THE PLAN BY THE DISTRICT.

No other management goals are listed at this time.

SECTION VI – NORTH PLAINS GROUNDWATER DISTRICT RESOLUTION ADOPTING THIS GROUNDWATER MANAGEMENT PLAN.

The District's Board of Directors adopted this groundwater management plan by resolution on May 13, 2008. This Plan is in effect on May 13, 2008 and will remain in effect until May 13, 2018 unless amended by the District's Board.

Any amendments to the groundwater management plan shall be developed by the District using the District's best available data and forwarded to the PWPG for use in their planning process.

APPENDICES

APPENDIX A - TEXAS WATER DEVELOPMENT BOARD DOCUMENTS

GAM Run 07-06 – Table 1

Table 1: Selected flow terms for the Ogallala Aquifer, into and out of the North Plains Groundwater Conservation District, averaged for the years 1980 to 1999 from the groundwater availability model of the northern part of the Ogallala Aquifer. Flows are expressed in acre-feet per year. Note: a negative sign refers to flow out of the aquifer in the district. A positive value refers to flow into the aquifer in the district. All numbers are rounded to the nearest 1 acre-foot and are probably only accurate to two significant figures.

Aquifer	Surface water inflow	Surface water outflow	Lateral inflow into district	Lateral outflow from district	Net inter-aquifer flow (upper)	Net inter-aquifer flow (lower)
Ogallala Aquifer	27,463	-31,663	65,259	-67,455	0	0

GAM Run 07-06 – Table 2

Table 2: Summarized information needed for the district's management plan. All values reported in acre-feet per year. All numbers are rounded to the nearest 1 acre-foot and are probably only accurate to two significant figures.

Management Plan requirement	Aquifer	Results from model simulation
Estimated annual amount of recharge from precipitation to the district	Ogallala	85,732
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Ogallala	31,663
Estimated annual volume of flow into the district within each aquifer in the district	Ogallala	65,259
Estimated annual volume of flow out of the district within each aquifer in the district	Ogallala	67,455
Estimated annual volume of flow between each aquifer in the district	Ogallala	0

APPENDIX B - PANHANDLE REGIONAL PLANNING GROUP CORRESPONDENCE

APPENDIX C - SURFACE WATER ENTITY CORRESPONDENCE

APPENDIX D - NOTICE OF PUBLIC HEARING