District Mission

Mesa Underground Water Conservation District (Mesa UWCD) will strive for the conservation, preservation, protection, and prevention of the waste of groundwater from the Ogallala Aquifer, the groundwater reservoir over which the District has jurisdiction. The District will implement water conservation and management strategies to prevent the extreme decline of water levels for the benefit of all water right owners, the economy, our citizens, and the environment of the territory inside the District.

Time Period for this Plan

This District Management Plan III becomes effective January 2, ~~2004~~2009 following ~~adoption~~it's being readopted by the local Board of Directors and ~~a certification~~is approved by the Texas Water Development Board (TWDB) ~~affirming this plan is administratively complete.~~ , executive administrator. This District Management Plan III will remain in effect for a period of ~~10~~5 years (minimum planning period), or until a revised or amended plan may be ~~certified~~approved or January 2, 2014, whichever comes first. The local Board of Directors ~~will~~may review the Management Plan II ~~on or before 5 years~~ I annually but must review and readopt the plan with or without revisions~~,~~ ~~as required~~ at least once every 5 years. The District shall provide the readopted plan to the executive administrator not later than the 60th day after the date on which the plan was readopted by the local Board of Directors.

Within 60 days of receipt of the readopted District Management Plan III under Subsection (e) Texas Water Code Chapter ~~36.1072~~36.1072, the executive administrator shall approve the management plan if it is administratively complete. District Management Plan III is administratively complete when it contains the information required to be submitted under Section 36.1071 (a) and (e).

Statement of Guiding Principles

The guiding principles in developing the District Management Plan I ~~and~~ , District Management Plan II and District Management Plan III are to better understand groundwater conditions, to encourage the most efficient use of groundwater, to preserve and improve groundwater quality, to increase public awareness and education, and to monitor legislative activities along with rules and orders of state agencies which may affect the private ownership of groundwater including the authority to manage groundwater at the local level.

The District acknowledges that groundwater resources of the region are of vital importance. The District recognizes the private ownership and rights of the landowner, as well as the private ownership and rights in the groundwater percolating below and emphasize that nothing in the Texas Water Code shall be construed as depriving or

divesting the owners their ownership or rights, except as those rights may be limited or altered (Texas Water Code Chapter 36.002), subject to the implementation of this management plan and rules promulgated by Mesa UWCD.

The District seeks to protect the private property rights of all water rights holders, whatever group of users they may represent. The District upholds the private property right of the owner to mine that part of the aquifer which the landowner obtained at the time of purchase of the land surface. The water use must be for a beneficial purpose and without waste. The aim of the District is to assure that all water rights owners are entitled to an equal opportunity to use the groundwater beneath their land. The District asserts that during the rule making process all groundwater users shall be treated fairly and impartially.

The District believes our most valuable natural resource **WATER** can be managed at the local level in a prudent and cost effective manner by regulating the spacing of the wells and the production of water from the wells. The administrative law process of permitting and well registration is the tool necessary to facilitate the District authority and capability to manage the groundwater resource.

The District is continually searching for better methods to understanding the local conditions of the Ogallala Aquifer. An accurate understanding of the aquifer and its hydrogeologic properties, as well as a quantification of resources is the foundation from which to build sound planning measures. This management document is intended as a tool to focus on the thoughts and actions of those individuals given the responsibility for the execution and performance of District functions and activities. The District Management Plan III is the guideline for the Board of Directors and District staff to follow in the operations of Mesa UWCD.

General Description

The District was created by the citizens of Dawson County through a local election in January 1990. The District boundaries are the same as Dawson County. The District has five board members, one member representing the residents from each single precinct from the four total county precincts and one at large member elected by and representing all of the residents in the county. The Board of Directors serve four year terms with a 2 year stagger and grouped with precinct 1 and 3 together for their elections and precinct 2, precinct 4, and the at large member grouped together for their elections 2 years later. The Board employs a General Manager, Administrative Manager, and a part time employee. The local economy is vibrantly substantiated by agriculture, ranching, and oil and gas production. The agricultural income is derived from cotton, peanuts, grain sorghums, alfalfa, and beef production. The ~~recent~~sharp increase in irrigated agriculture 16 years ago has greatly helped to stabilize the economy and expanded the cropping possibilities for agriculture in this semi arid community.

Location and Extent

Dawson County and Mesa UWCD, a square 30 mile by 30 mile county totaling 900 square miles, is located in the southeast small portion of the enormous Ogallala Aquifer. The Caprock Escarpment squeezes off the Ogallala on, along or near the east boundary of the District. Borden County joins us on the east, Martin County on the south, Gaines County on the west, and Lynn County along with Terry County on the north. Lamesa, which is centrally located in the county, is the county seat and where the District Office is located at 212 North Avenue G. O'Donnell, located in the northeastern part of the county with the county line dividing the largest part into Lynn County, is the next largest town in the District. O'Donnell, much like Lamesa, receive their municipal water from the Canadian River Municipal Water Authority (CRMWA) via an inter basin transfer through a pipeline networking system beginning at Lake Meredith over 240 miles away. Ackerly is located in the southeastern part of the county and it too is divided by the county line with Martin County. Ackerly depends upon a well field with three water wells, located in the District, to supply the community with groundwater for their use. Welch is located in the northwestern part of the county and they too depend on groundwater for their community water needs.

Topography and Drainage

Lamesa has a Spanish name which means "the table top". This name is true because when you climb over 100 feet almost straight up the side of the Caprock Escarpment you reach the "Mesa". The flat land slopes from NW to SE with less than a 375 feet drop over the 45 miles diagonally across the District. The altitude is 3172 feet on the Gaines, Terry, and Dawson County lines intersection. The altitude is 2800 feet on the Borden, Martin, and Dawson County lines intersection. The rainfall, when showering gently, on Mesa UWCD basically remains where ~~it~~the rain drops~~.~~ fall. This is one of the major factors which enable the dryland agricultural community to survive and flourish in our semi arid climate.

Mesa UWCD lies within the drainage system of Colorado River Basin. Tobacco Creek, originating in Dawson County and dry almost all of the time, is the headwaters of the Colorado River which empties out into Matagorda Bay and the Gulf of Mexico. There are no other surface waters in the District.

Groundwater Resources for Mesa UWCD

Historical data of water level monitor wells clearly show the water levels in Mesa UWCD

were at a benchmark high in January 1993. Texas Water Development Board records were passed along to the District when TWDB staff trained district personnel to take over the monitoring program in January 1991. Historical data on well # 28-09-901 dates back to 1938 and the record clearly reflects this well never had as much water in it as was recorded in 1993. Consequently, any other data source that cannot reflect, accurately, this situation, then that data is not the best data available.

Because a complete and thorough understanding of the Ogallala Aquifer is not necessary for all the water users, the following two (2) paragraph discussion of geology and hydrology is good general information. (Bell, Ann, Morrison, Shelly, November 1978 *ANALYTICAL STUDY OF THE OGALLALA AQUIFER IN DAWSON AND BORDEN COUNTIES, TEXAS*, Texas Department of Water Resources, ~~Rept~~Report 225, 3 p.)

"Fresh groundwater in Mesa UWCD is obtained principally from the Ogallala Formation of Pliocene age. Water in the Ogallala Aquifer is unconfined and is contained in the pore spaces of unconsolidated or partly consolidated sediments.

The Ogallala Formation principally consists of interfingering bodies of fine to coarse sand, gravel, silt, and clay-material eroded from the Rocky Mountains which was carried southeastward and deposited by streams. The earliest sediments, mainly gravel and coarse sand, filled the valleys cut in the pre-Ogallala surface. Pebbles and cobbles of quartz, quartzite, and chert are typical of these early sediments. After filling the valleys, deposition continued until the entire area that is now the Texas High Plains was covered by sediments from the shifting streams. The heavy clay material called the "red bed" serve as a nearly impermeable floor for the aquifer".

The Ogallala Formation is presumed to exist under the entire District surface except that area ~~to~~in the ~~east,~~eastern part of the county, off and below the Caprock Escarpment. The Ogallala Aquifer is very different throughout the District because of the vast differences in the permeability of the interfingering bodies of water bearing sands and clay materials. Irrigation wells capable of producing large amounts of water may be found and only a short distance away the aquifer may provide hardly enough water for domestic needs: even though, the water levels in the two wells may be the same and the well depths the same. Well yields are subject to deviations caused by localized geological conditions. The Ogallala is not a homogeneous formation: that is, the silt, clay, sand, and gravel which generally comprise the formation vary from place to place in the thickness of the layers, layering position, and grain -size sorting. The porosity of the formation also contributes to determining the well yield.

The District has been very involved in the data collection process in an effort to better understand the characteristics of the Ogallala Aquifer in Mesa UWCD. The 230 Annual Water Level Monitoring Wells coupled with the Aquifer Evaluation Program have caused us to believe there are multiple differences in the aquifer formations existing in Mesa UWCD. Through extensive data collections and evaluations we believe we can distinguish between several of these geological strata. At the local level, we have

identified and named these different subdivisions such as Ogallala River Channel, West Ogallala, Edwards Aquifer of Dawson County, Alaska, Dry Land and several minor areas such as United, Cooper, Sands, Friendship and Ackerly. We believe these definite different aquifer characteristics make groundwater management in Dawson County unique and different from other parts of the Ogallala Aquifer in GMA 2.

The water quality in the District is as different as the water quantities. The interfingering bodies contain many different minerals and in various amounts. Consequently, the water may be of highest quality in one well and very poor quality not so far away. All wells need to be tested to determine the quality of the water produced by that well. Most of the poor quality water problems appear to be from natural causes. However, there are isolated instances where groundwater contamination from past oil field practices have occurred. The high concentration of chlorides suggest the contamination was from oil field brines, disposed in unlined surface pits prior to the statewide "no pit" order, in 1964, by the Texas Railroad Commission. Additional brine contamination may be a result of abandoned oil, gas, injection wells, and wells with improperly cemented casings.

In the Management Plan I (August 31, 1998 – September 1, 2008) the District used the TWDB's Groundwater Availabilities Estimation Process, which uses available data-sets to generate digital descriptions of the aquifers as well as estimates of recharge and availability rates. The data-sets describe saturated thickness and yield, which the product describes as water in storage. When combined with recharge and production values, these estimates can be used by the District to derive goals for future estimates of available groundwater and the possibility of any necessary production limitations.

Surface Water Resources of Mesa UWCD

There is ~~no~~ very little surface water available for use in the District. As a result of large fast rains, run off water is collected in natural topographical depressions referred to as playa lakes. These natural lakes allow the rainwater to percolate downward to the aquifer and create natural recharge of the aquifer. This lake water does not last very long. It evaporates and drains away so fast there is little or no time for wildlife to establish habitat patterns.

Tobacco Creek, headwaters of the Colorado River, is ~~not~~ a very small source of surface water available for use in the District. The only surface water impounded, a very small number of dirt tanks, is used strictly for livestock drinking water. Consequently, the conjunctive surface water management issues within the District are not-applicable.

Inter-basin Transfer of Water into the District

Inter-basin transfer of water is very important to the residents of Lamesa, Texas, the

county seat of Dawson County and the largest town in Mesa UWCD territory. Water, upon which the city dwellers of Lamesa have been dependent upon for the past ~~3~~ **4**0 years comes from Lake Meredith, located in the Canadian River Basin. Transported water crosses the Red River Basin, Brazos River Basin and into the Colorado River Basin. Inter-basin transfer is not new or unique to the residents of Dawson County. The District supports inter-basin transfer of water. Likewise, the District supports the removal of "Junior" as passed in Senate Bill #1. This action by the legislature has resulted in **NO** surface water inter-basin transfers dated since this passage.

The city of Lamesa was an original founding member of the Canadian River Municipal Water Authority. Over 90% of the municipal use for the city comes from Lake Meredith. Lake Meredith is located over 240 miles to the north. The water travels to Lamesa through an underground pipeline system connecting member cities such as Pampa, Borger, Amarillo, Plainview, Lubbock, Slaton, Levelland, Tahoka, Brownfield, O'Donnell, and Lamesa. Lamesa and O'Donnell both contract with the city of Lubbock to treat the raw water at their big efficient treatment plant. This makes the treated water less expensive for city residents. The water is then piped to Lamesa, at the end of the pipeline.

Mesa UWCD has no jurisdiction over surface water. Likewise, chapter 35.003 states "The laws and administrative rules relating to the use of surface water do not apply to groundwater". Consequently, the city of Lamesa must work out all necessary arrangements for the present and future use of surface water with CRMWA. City officials may contract for the amount CRMWA has available and is willing to sell. The city owns several hundred acres of water rights inside the District. The city water wells provide only a small part of the total annual demand for water. The city of Lamesa, like all other water users, must follow the rules of Mesa UWCD for their production and use of groundwater. The City of Lamesa had a stakeholder on the planning committee which studied groundwater uses in Mesa UWCD prior to the rule changes of 1997. The other stakeholders were satisfied with a lesser amount **such as 3 acre feet per year**; but, the influence for meeting the needs of the City of Lamesa is the reason the District adopted the maximum of 4 acre feet per year.

Transfer of Groundwater Out of District

The City of Gail, county seat of Borden County, receives their municipal water supply from water wells located in the territory of Mesa UWCD. This transfer arrangement dates back to 1978. The city of Gail relies on this water supply as their soul source of municipal water.

The contract calls for an annual maximum supply of 239 acre feet per year. The amount of actual demand is much less than the supply contract. The single most important factor affecting the annual amount of use is rainfall. The average usage is generally less than 25% of the contract amount. At the current usage rate the supply of groundwater

should last the city of Gail much longer than this management plan is in effect. The District will coordinate this effort with Colorado River Municipal Water District and Region F.

The District is aware of the needs for municipal water use throughout Texas. Likewise, the District is mindful of the rights of groundwater owners to market their resource. As a result, the Mesa UWCD will do everything possible to protect **all** water users under our permitting process with strict requirements that promote fair and equitable spacing and production limitations. The District supports the beneficial use of water inside or outside the District providing all conditions are consistent with the rules of Mesa UWCD.

Projected Groundwater Supplies in Mesa UWCD

The true and accurate supply of groundwater available for use in the District may be very difficult to determine. The TWDB figure 4, page 10, Report 341 shows the water level changes in this District. The 20 feet, 40 feet, and 60 feet rises continued through the year 1993. The area where the 60 feet rise is drawn on the map continued to a rise of over 83 feet. The water levels in 100% of the Districts' measurement wells reached benchmark highs in January 1993. Historical data from one monitor well 28-09-901 dates back to 1938 and never before had the water level been as high as in January 1993. The high level in 1993 was higher than before the first gallon of water was ever pumped~~.~~ from well 28-09-901.

In contrast to the 20 year trend of water level rises up through January 1993, the water levels started a decline in 1994 and have continued the downward trend through January 2003. In January 2003, 89% of the 188 monitor wells had a decline. However, in stark contrast, it is to noted that well 27-24-202 has risen every single year since the District started measuring in 1991. The historical water level average prior to 1991 was -77.60' and in 2008 the level was -25.58'. That is a 52' rise over the past 18 years. Any data set that cannot reflect this exact situation is not to be considered the best data available.

Because Mesa UWCD is so unique and different with so many variable aquifer conditions, long term assumptions are virtually impossible to make with any degree of certainty. Just as District Management Plan II was completed for certification on January 2, 2004, with an emphasis on the seemingly consistent declines of the monitor wells, the Annual Water Level Monitoring Program for the year 2005 reveals an average rise in 205 monitor wells of +1.58 foot. The Annual Water Level Monitoring Program for the year 2008 shows another year with a overall rise in 216 monitor wells of +2.71 foot. Of the first 5 years the Annual Water Level Monitoring Program represented in District Management Plan II, water rises have accounted for 40 % of the annual measurements. Basically, the only thing consistent with water levels in Mesa UWCD is their inconsistency. Therefore, any other data source that cannot reflect this situation, then

that data source is assumed “not to be” the best data available.

The District will use the beginning values for the *Estimated Volume of Water in Storage*, TWDB Report 341, page 13, September 1993. The report, in millions of acre feet, as follows:

County	Unused	1990	2000	2010	2020	2030	2040	2050
Dawson	0.70	6.31	6.44	5.07	4.18	3.71	4.24	4.77

The District under Management Plan III has attempted to develop a more comprehensive methodology to determine the most accurate water in storage estimate. With the aid of TWDB, who have provided a sizeable number of water meters that are mounted on center pivot systems, the District now has ~~84~~167 meters from which data is gathered to better calculate a more accurate estimate of the annual crop use. The annual irrigation use as determined by the more accurate crop use data makes it possible to better determine the amount of water used from the aquifer each year. Consequently, the District believes the volume of water in storage to more closely represent the numbers as presented above. The volume of water in storage will decline until recharge once again overcomes pumpage as it has done in the past. It appears history will continue to repeat itself. As a result of the +1.58 foot rise in 2005 and the +2.71 foot rise in 2008, true and accurate evidence is continually proving that recharge in Mesa UWCD is different from other parts of the Ogallala Aquifer.

Groundwater Use in Mesa UWCD

During the first five years of District operations ~~under~~prior to District Management Plan I, annual groundwater usage in Dawson County (shown in yellow) has varied from a high of 67,117 acre-feet to a low of 39,678. The annual usage for the first five years is shown from 1991 -1995 and reflected in ~~Management Plan I:~~District Management Plan I. District Management Plan I shows an annual groundwater use (shown in green) from a low amount in 1996 of 85,925 acre-feet to a high in 1998 of 158,500 acre-feet. District Management Plan II shows an annual groundwater use (shown in blue) from a low amount in 2007 of 67,742 to a high in 2006 of 126,952:

2007	67,742 acre-ft/year
2006	126,952 acre-ft/year
2005	108,312 acre-ft/year
2004	106,455 acre-ft/year
2003	123,699 acre-ft/year
2002	125,671 acre-ft/year
2001	139,641 acre-ft/year
2000	148,856 acre-ft/year
1999	150,500 acre-ft/year
1998	158,500 acre-ft/year
1997	119,033 acre-ft/year
1996	85,925 acre-ft/year
1995	67,117 acre-ft/year
1994	51,227 acre-ft/year
1993	67,006 acre-ft/year
1992	39,678 acre-ft/year
1991	47,883 acre-ft/year

The data numbers for the first 5 years were obtained from Texas Water Development Board's ~~*Estimated Groundwater Pumpage Summary by Major Aquifer*~~ ***Water Uses Survey-Groundwater Pumpage Estimates***. These numbers for Dawson County (058) include municipal, manufacturing, power, mining (oil and gas recovery) irrigation and livestock. Data was verified by contacting city of Lamesa and city of O'Donnell water utilities. Files of the Texas Railroad Commission were searched to obtain historic information on freshwater used in the production of oil and gas. The data for fresh water used in water flood projects in 1994 is estimated to be around 711 acre feet or 2.4% of the total annual pumpage within the District. These values are quite close to the

numbers used by TWDB in this report.

In Management Plan I these numbers were used with the intention of gathering better data for Management Plan II. The District believes the data being gathered currently will give a more true and accurate evaluation of use and conditions of the Ogallala Aquifer in Mesa UWCD. The data from 1996-2002 is data gathered and analyzed by Mesa UWCD. Because of further development of more meters , **being installed** the data collected by the District from 200**3**-2007 is even better data. Therefore, the level of confidence in these groundwater use numbers is extremely high. The District will continue to add meters into the Aquifer Evaluation Program. The addition of more meters will make the information more valuable as we go forward with the implementation of District Management Plan III.

The District has developed a very extensive water use measurement program. The District with the assistance of the TWDB has been able to purchase over 70 water meters. These meters have been installed in center pivot systems and drip irrigation applications. In addition to these 70, there are other center pivots with meters installed on them. With the voluntary assistance of these land owners, the District is now gathering water use data from ~~84~~167 sites. This data is invaluable in determining the actual amount of water applied to the irrigated acres and the different crops in the District. Likewise, this data provides the District with much more accurate numbers to be used in determining the total amount of water withdrawn from the Ogallala Aquifer on an annual basis.

The District provides this information gathered from the water meters to the TWDB not only annually but also on a monthly basis during the growing season. This activity is known as our Aquifer Evaluation Program (AEP). The intent of this program is to gather data reflecting the change in the aquifer as a result of the known irrigation applications. The data showing the change in aquifer is reflected in the 111 non-pumping monitor wells in irrigated areas.

The District has 3 special named sites in which the total amount of water pumped from that particular site is metered. In addition to the meters being read monthly during the growing season, the non pumping monitor wells in these sites are also measured to gather the data reflecting the effect on the aquifer as a result on the known amount of water being removed. The Southwest AEP has ~~31~~53 metered sites. The Southwest AEP has ~~19~~27 non pumping monitor wells in and around this area. The Kentucky AEP has ~~20~~26 metered sites. The Kentucky AEP has ~~10~~11 non pumping monitor wells in and around this area. The OK Corral AEP has ~~17~~22 metered sites. The OK Corral AEP has ~~6~~7 non pumping wells in and around this area. The District just had 2 of these wells drilled in September 2003 to give the OK Corral a better coverage. The District had an additional 3 monitor wells drilled in 2007 to add additional coverage to the Southwest and Kentucky areas. The total units in the 3 named site areas is ~~68~~106 meters and ~~35 monitor wells. That represents a~~45 monitor well~~ for every 2 meters.~~ s.

The District also had added another area for data collection. This site is known as Alaska. This area is around the Klondike School. Every single irrigation unit is metered in this site. The 16 center pivots with meters and the 7 non-pumping monitor wells give us excellent coverage for data collection in the aquifer we have named Alaska.

The District also has an expanded program which extends into all the irrigated areas through out the entire district. There are ~~16~~50 other sites where meters are installed to gather data. The number of non-pumping monitor wells located in other irrigated areas account for 32 additional data collection points. This area is known as ~~the~~ UMP.

The District feels that with ~~84~~167 meters and ~~79~~111 monitor wells, and the data being collected 6 times a year for a total of ~~966~~1668 data base collection sites, the information gathered is very accurate and reliable. In addition, one must remember that the ~~79~~111 monitor wells measured 5 times a year during the growing season, are also a part of the annual water level monitoring program which totals ~~190~~230 measurement wells that are measured in January of every year. The 230 wells make up the Annual Water Level Monitoring Program. The results of the 230 water level wells can be found at the TWDB or at our website, www.mesauwcd.org .

With the very capable assistance of the TWDB both technical and financial, the District feels that data collection in Mesa UWCD is on the brink of developing a~~n~~ new understanding of the Southern Ogallala Aquifer as never before experienced in hydrologic studies~~.~~ by many of the experts. The District is very happy with ~~this~~our working relationship with the TWDB and look forward to continued success.

All members of the Board of Directors are very dedicated to the data collection programs in Mesa UWCD. The belief of the District is that only through the best data collection programs possible will adequate knowledge of the aquifer in Mesa UWCD be sufficient to make decisions concerning the viable life of irrigated agriculture within the District. The District will continue to gather vital data for the evaluation of the aquifer changes and the amount of groundwater used each year. This data will be used to continually update the “Water Use and Projections” as well as the “Volume of Water in Storage”. As in the past, the District will continue to work closely with the TWDB.

Groundwater Availability Model

The District applauds the Texas Legislature for their foresight to provide a Groundwater Availability Model (GAM) for the Southern Ogallala Aquifer. The District congratulates the TWDB for the work they performed in allowing the interested parties to be participants in the selection process of the firm to prepare the GAM. The District appreciates the ability to work with the TWDB in awarding the contract for the GAM of the Southern Ogallala in Texas and New Mexico. Likewise, the District is very thankful to T. Neil Blandford with *Daniel B. Stephens & Associates, Inc.* for the ability to work with him and his staff during the process of developing the GAM. The District promotes the GAM as a very good tool and supports the process. The District was very active

from the beginning of the process and continued input into the GAM until the final draft. Nevertheless, the Board of Directors considers and views the GAM as the basis for developing the District Management Plan II and District Management Plan III. However, because of the extreme recent changes which have occurred and are continuing to occur on an annual basis in Mesa UWCD the GAM is seemingly unable to reflect the actual true and proven events as they are more recently and currently occurring in Mesa UWCD.

Texas Water Code Chapter 36.1071 Management Plan (h) clearly states *"In developing its' management plan, the district shall use the groundwater availability modeling information provided by the executive administrator in conjunction with any available site-specific information provided by the district and acceptable to the executive administrator".* The District trusts that the executive administrator will accept the site-specific data the District has collected and has continually shared with TWDB. The TWDB is the entity most responsible for providing the professional guidance and financial support in the development of the site-specific data the Board of Directors voted on August 23, 2003 to use for the development of Management Plan II. The Board of Directors once again voted on September 10, 2008 to use the site specific data developed by Mesa UWCD as the data to be used in developing Management Plan III.

Mesa UWCD has a very extensive Annual Water Level Monitoring Program. The total number of monitor wells the District will measure in January ~~2004~~2009 will be ~~190.~~ 230. Since the district was created in 1990 the District has continued to add monitor wells to the Annual Water Level Monitoring Program. There are currently 46 monitor wells in the program that the TWDB turned over to the District for measurements in January 1991 when the TWDB employee worked with District staff in providing expert training for the Annual Water Level Measurement Program. Since that time, the District has added more and more new wells into the Program ~~(2~~(16 new wells in ~~2003)~~2008) until we are at the ~~190~~230 sites for the ~~2004~~2009 measurement event. The District measures these monitor wells in the first part of January and send the information to the TWDB before the end of January. TWDB staff member Dennis Jones has been working with the District handling the Annual Water Level Monitoring Program. Since the retirement of Dennis Jones, I believe we will be working with Bryan Anderson. The Annual Water Level Monitoring Program information is on line at www.twdb.state.tx.us and www.mesauwcd.org for anyone and everyone to view and utilize.

Please note how the differences in developing Management Plan II and new District Management Plan III have almost completely different scenarios of groundwater conditions to consider.

In the development of Management Plan II, the District believes the most important ingredient is the observation of exactly what the groundwater levels are actually doing at ~~the most current~~this particular time in history. The Management Plan II will use the most ~~current~~accurate data available. The ~~most current~~ water level information will be

the measurements taken in January 2003. The District measured 188 monitor wells in 2003. However, 16 of them were new monitor wells and there was no new data results from them. Of the 172 wells comparably measured, there were 149 wells with declines. In the irrigated area there were 134 wells with declines. The average decline of the monitor wells in the irrigated area was -2.95 ft. In the dryland area there were 15 wells with declines. The average decline was only -.78 ft. In the dryland area there were 12 wells with rises at an average rate of +.86 ft. There were only 7 wells that indicated a rise in the irrigated area; but, the average rise was +4.61 ft. In conclusion there was a percentage of declining wells in Mesa UWCD at a rate of 86.6 %

A year ~~earlier,~~prior, in the measurement period ended January 2002, the District measured 172 monitor wells with 21 new wells with no new data results. Of the 151 wells measured, there were 130 wells with declines. In the irrigated area there were 108 wells with declines. The average decline was -3.00 ft. In the dryland are there were 22 wells with declines. The average decline was -1.78 ft. In the dryland area there were 9 wells with rises at an average rate of +1.56 ft. There were 12 wells that indicated a rise in the irrigated area: but, the average rise was +5.81 ft. In conclusion there was a percentage of declining wells in Mesa UWCD at a rate of 86.1 %.

Two years prior, in the measurement period ended January 2001, the District measured 152 monitor wells with 16 new wells with no new data results. Of the 136 wells measured with changes, there were 73 wells with declines. In the irrigated area there were 69 wells with declines. The average decline was -3.20 ft. In the dryland are there were 4 wells with declines. The average decline was -.56 ft. In the dryland area there were 27 wells with rises at an average rate of +2.28 ft. There were 36 wells that indicated a rise in the irrigated area: but, the average rise was +2.57 ft. In conclusion there was a percentage of declining wells in Mesa UWCD at a rate of 53.5 %.

The trend of a declining water level started in 1994 and the declining water levels have continued through the measurement period in 2003. With the current measurements the District has made during the growing months of June, July, August, Sept., and Oct. 2003, there ~~is~~was evidence the declines ~~will~~would continue into the 2004 measurement period. Sure enough after the Management Plan II was adopted and approved on January 2, 2004, the annual Water Level Program revealed an average decline of -2.95 ft. Just as Management Plan I revealed a steady decline of the aquifer since the benchmark high in January 1993, Management Plan II started off with the same results.

The declining water level situation over the past 10 -11 years is a complete turn around from what was happening in the District prior to 1993 when the aquifer in Mesa UWCD reached ~~a~~the benchmark high. Prior to January 1993 the levels had been on a rise since the mid 1970's when the aquifer in Mesa UWCD had reached a benchmark low. Within a period of around 20 years the Ogallala Aquifer in the Southern Region had made a tremendous turnaround. However, that upward trend, regardless of how profound and significant, during the mid 1970's through 1993 ~~is~~seems to be no longer

true. The water level measurement records since 1994 prove the aquifer to be on a declining trend.

The final report of the GAM does an excellent job of portraying the condition of the water levels in Mesa UWCD up until 1998-1999 with the illustration of well 28-09-901("The Well") labeled Dawson 2. This illustration is on the top of about page 18 of Appendix D "Simulated and Observed Hydrographs for transient Model Calibration". Historical records show the water level on this well the first time measured in 1938 to be -122.77. Between 1938 and 1950, just prior to irrigation being introduced in Dawson County in the early 1950's, the well had risen to a level of -119.87. With the beginning and continued irrigation during the 1950's, 1960's, and mid 1970's, the well reached a benchmark low in 1977 of -137.80. This well has a depth of -150. At this ~~time~~ period~~,~~ in time, the aquifer was getting very low and the price of fuel to pump the wells in Dawson County was very high. Irrigation practices were basically stopped and the farmers went back to dryland farming. Al most immediately, the aquifer started to recharge and the water levels begin to rise in this well. By 1981 the level had risen 10 ft. By 1987 it was within 1 ft. of the beginning level of 1938. After the 100 year rains of 1985 and 1986 the water levels were rising fast. In 1990 the water level rose +13.63 ft. The well continued to rise an additional +11.63 and reached a benchmark high in January 1994 at -96.92. However, the well from 1994 through 2003 has declined a total of -18.08. The annual declines are: -0.33, +0.03, -3.65, -1.32, -4.14, +0.50, -3.67, -2.50, and -2.50. Of the -18.08 decline, -12.81 or 71 % has come since 1999. In preparation of Management Plan II, the District believes this data reflects the true and accurate groundwater levels in Dawson County. ~~Therefore,~~ At this time in history, the District believes the Graph Dawson County 2 should have an even more exaggerated decline than shown.

The final report of the GAM does an excellent job of portraying the condition of the water levels in Mesa UWCD up until 1998-1999 with the illustration of well 27-07-901(OXY Oil Patch) labeled Dawson 4. This illustration is on the top of about page 19 of Appendix D "Simulated and Observed Hydrographs for transient Model Calibration". The graph illustrates correctly the benchmark high of the aquifer in 1993 at -47.72 ft. The downward trend is quite evident through 1998. Since the last date on the graph the water level has continued the downward trend with declines of -6.83, -6.92, -7.58, -4.25, and -3.91 for the years 1999-2003. The water level in this well at the 2003 measurement is -88.46. This change represents a -40.72 ft decline. Therefore, in preparation of Management Plan II, the District believes the graph should continue to show a declining trend through 2003.

The final report of the GAM does an excellent job of portraying the condition of the water levels in Mesa UWCD up until 1998-1999 with the illustration of well 28-26-206(Stage Coach) labeled Dawson 5. This illustration is on the bottom of about page 19 of Appendix D "Simulated and Observed Hydrographs for transient Model Calibration". The observed water levels seemingly are turning downward, and very well they should be because the water level measurements from 1999-2003 went down another -2.74. The District is quite concerned that the simulated water level line seems

to turn upward rather than downward as would be the case with the true and accurate measurements since 1999. However, we find that the water level in 2003 was -74.95 ft. Then with 3 years of rises in the past 5 years during the Management Plan II, the level in 2008 is -72.03. The level recorded in 2008 is the benchmark high for this well.

With all the good water level monitoring wells the TWDB were measuring prior to the creation of the District in 1990, at which time the responsibility of measuring the observation wells in Dawson County was turned over to the District, and the District has continued measuring up through the year ~~2003~~2008 a total of 46 of the original wells started by the ~~TWDB,~~TWDB. To our astonishment, we do not understand the use of Dawson 1 and Dawson 3 which indicate the water level measurements were stopped in the 1986 -1988 period. The TWDB had already stopped measuring these wells before the District was ~~created.~~even created and there is no current data for over 30 years.

The District believes this to be the beginning or point # **1**, whereby the site specific data gathered by Mesa UWCD and shared with the TWDB becomes the best available data for the development of Management Plan II~~.~~ and will also be the best available data for the District Management Plan III. The final GAM report shows "Simulated Water Levels for 2010-2050, Average Conditions" on figure 70, 71, 72, 73, and 74 shows only one dry cell and a whole multitude of flooded cells. The final GAM report shows "Simulated Drawdown for 2010-2050 Average Conditions on figure 75, 76, 77, 78, and 79 shows water level rises from 0-25 with rises greater than 25 in the year 2050. The final GAM report shows "Simulated Saturated Thickness 2010-2050, Average Conditions on figure 80, 81, 82, 83, and 84 to continue to grow thicker and thicker. The final GAM report shows basically the same results with only minor reductions for Drought of Record" on figure 85-102. The GAM shows a continual increase in the availability of groundwater up through the year 2050.

The District requested a model run from the TWDB. As always the TWDB accommodated quickly and efficiently. The GAM model showed a "Volume of Water in Storage for 1996" to be 7.4 million acre-ft. Later the District requested a model run for the "Volume of Water in Storage for 2050 Drought Conditions". The results from this request were also accommodated by the TWDB quickly and efficiently and the report prepared by Richard Smith calculated the amount to be 7.5 million acre-ft.

The District believes this to be point # **2**, whereby the site specific data gathered by Mesa UWCD and shared with the TWDB becomes the best available data for the development of Management Plan II~~.~~ and District Management Plan III. The District has prepared a graph titled "GAM Estimated Volume of Water in Storage" at the bottom of page ~~15~~25 to show the result of the GAM run. One can quickly see a steady increase in "Volume of Water in Storage" going from 7.4 up to 7.5. The GAM model run indicates that in 1996 there was 7.4 million acre-ft of groundwater in storage in Dawson County. A GAM model run using the drought of record indicates the "Volume of Water in Storage" by the year 2050 will have risen to the 7.5 million acre-ft level.

The District supports the two (2) graphs titled “Mesa UWCD Estimated Volume of Water in Storage” and “Region O Estimated Volume of Water in Storage” on page ~~15.~~25. The District believes the beginning values for the *Estimated Volume of Water in Storage*, TWDB Report 341, page 13, September 1993, as used in Management Plan I, reflects a more accurate estimate of the groundwater in storage. These two (2) graphs reflect the information present previously on page ~~6~~8 “Projected Groundwater Supplies In Mesa UWCD”.

The District believes that just as in the past, history will once again repeat it’s self. The graph “Mesa UWCD” shows the “Volume of Water in Storage” to again start an upward trend in 2030. This is the same trend that occurred in the mid 1970’s when the aquifer got low and irrigation virtually stopped completely and recharge could once again surpass pumpage. Providing with the great fortune, the District could once again receive the 100 year rain event like the mid 1980’s, there might be a new benchmark high water level sometime out in the future.

The final report Appendix C “Historical and Future Pumping Demands for Southern Ogallala GAM” provides some very interesting and valuable information regarding the historical agricultural pumpage in Dawson County. This information is found on table C-1 page 41, 42, 43, 44, 45, 46, and 47. With the introduction of irrigated agriculture in the early 1950’s there is evidence on page 41 that the amount of pumpage more than doubles by the end of 1959 when there was more than 112,000 acre-ft of water pumped. The amount of water pumped in Dawson County continued to go upward until the highest amount of water usage was reached in 1964 when a total of 148,783 acre-ft of water was used for irrigated agriculture. That water use trend then turned downward until the 1970’s when the aquifer reached it’s bench mark low in the mid 1970’s and the total pumpage in 1979 was very low 9,700 acre-ft. The District believes this historical information to be in balance with the historical events occurring in Dawson County during this period of time.

The District believes this to be point # **3,** whereby the site specific data gathered by Mesa UWCD and shared with the TWDB becomes the best available data for the development of Management Plan II~~.~~ and **D**istrict Management Plan III. The final report Appendix C “Historical and Future Pumping Demands for Southern Ogallala GAM” on page 44 begins the more current water usage calculations since the District was created in 1990. This information is presented on page ~~16~~20 of District Management Plan III in the graph titled “GAM Water Use and Projections”. The graph reflects the numbers presented in the final report. The 1996 number of 81,617 acre-ft., that amount is just less than the highest number recorded in 1997 of 95,400 acre-ft., which is the maximum amount of usage shown in the final report for the current usage. The number for the year 2000 is 36,475 acre-ft. and the number on page 45 for 2010 is 34,074 acre-ft. Mesa UWCD has data for the year 2000 which shows usage of 148,856 acre-ft. Because of the tremendous amount of data the District and the TWDB are collecting, analyzing, and available at the TWDB, the numbers presented in the GAM are not consistent with the site specific data.

The site specific data presented in the graph titled “Mesa UWCD Water Use and Projections” on page ~~16~~20 of District Management Plan III is a product of the data collection programs established by the District with the technical and financial support of the TWDB. The data presented on the chart in the “Groundwater Use in Mesa UWCD” on page ~~7~~9 is the product of the data collection programs. These numbers are the very best estimates possible using the results of annual crop acreage reports and multiplying by the average water usage for the various crops for each particular year. The graph of Mesa UWCD begins basically the same as the GAM and Region O graphs. However, both these graphs have a sharp rise and fall on either side of the 1996 estimated use bar. This radical change in water use from 1990 to 1996 to 2000 was not the case. The graph of Mesa UWCD takes a much smoother contour. If one graphed the chart on page ~~7~~9 the high bar would be in 1998 when the estimated usage was 158.500 acre-ft. The estimated usage in 1999 was 158,500 acre-ft. The estimated water use in 2000 is about 10,000 acre-ft less than the high two (2) years prior. The District is very confident the estimated use of irrigation water in Mesa UWCD in the year 2000 was 148,856 acre-ft. as shown on the Mesa graph not the 36,475 acre-ft as shown on the GAM graph. The water use in 2004, the first year of Management Plan II the water use was down to 102,272 acre-ft. The water use did increase to 126,951 in 2006 due to a very dry year. However, 2007 was a very wet year and the pumpage dropped to a modern era low of 67,742 acre-ft.

The water usage in Mesa UWCD will continue to ~~decline.~~decline, but maybe not to the 2007 level. This decline is a result of the three (3) points highlighted in the above section. The number 1 and most important factor to ever be considered in evaluating groundwater in Mesa UWCD is the water level of the aquifer as indicated by the water levels measured in the ~~190~~230 monitor wells. The number 2 factor in evaluating the conditions of the aquifer is the sum of the water level measurements as indicated by the measurements of the ~~190~~230 monitor wells to determine the “Volume of Water in Storage”. The number 3 point “Water Use” is a final result of number 1 and number 2. There will always be a direct correlation between the water level of the aquifer and the possibility of the total water use. When the aquifer is full as in the benchmark year of 1993/1994, the aquifer can meet the needs for water use as indicated ~~in 1998.~~by1998 water use. When the level of the aquifer begins to decline, the maximum needs cannot be met and the water use will decline as indicated since the high usage benchmark of 1998. The District will be diligent in the continued collection of water level information; because, we believe that in a sand aquifer like we have in Mesa UWCD the volume of water in storage in the aquifer as ~~revealed~~illustrated by the condition of the aquifer can best be revealed by the water level monitoring program.

The District trusts the TWDB will evaluate this site specific data and conclude these numbers to be the best data available for the development of District Management Plan III, just as they did for Management Plan II.

Recharge in Mesa UWCD

The District is very proud of the Aquifer Evaluation Program (AEP) that has been developed with the cooperation and financial support of the TWDB. The District has gathered data in the AEP that strongly indicates the possibility of a recharge rate in Mesa UWCD that is a much higher rate than anything which has been discovered in prior studies. This data also indicates the recharge occurs in a much quicker time period, from when the rain event occurs until the aquifer shows a profound rise in the water levels, than prior studies have shown.

This example is the results of a happening that has caused the District to support a new and different recharge theory for Mesa UWCD. In the AEP, during May and the 1st part of June 2003 we received rainfall between 2 ½ and 7 inches. The irrigated crops were planted and growing. The rainfall events stopped completely by June 9. All the "non-pumping wells" (33) were measured on June 20. At this June 20 measurement, every single well of the 33 water level monitor wells showed a decline in the aquifer water levels from the January "Annual Water Level Measurement Program" All the meters were read on June 20 (68). From this date forward, all of the center pivots in the AEP (with the exception of 1 unit) and all other surrounding center pivots were running full steam ahead at maximum production capacity, which is consistent with the drought policy of the District "the drier the natural conditions the more a producer must apply through irrigation".

By July 20 the district was in day 41 of drought conditions. The 67 center pivot systems had put out an average of 3.97 inches per acre on 7,689 acres which calculates to more than 2,543 acre feet of water being pumped from the aquifer. However, the most astonishing thing was discovered when measuring the "non-pumping wells". The results of the July 20 measurement showed that 22 wells had water levels that indicated a rise in the water table of the aquifer. That is a 67% ratio for rise and a 33% decline rate. The 22 wells with rises had an average rise of +.83 ft. or 10 inches. There were four (4) wells straight across the middle (from west to east and within a 3 mile distance) of the Kentucky site with rises of +.41, +2.83, +1.00, and +1.75. The District does know for certain that these wells had more water in them on July 20 than they had in the previous measurement on June 20. This new water in the aquifer that caused this tremendous rise had to come from somewhere, no doubt about that factual data. The AEP is a 10 year plan and is the data collection tool that the District, with the coordination and support of the TWDB, will use to continue the study of "Mysterious and Occult" groundwater in Mesa UWCD. The AEP for Southwest, Kentucky and OK Corral has now grown to 106 meters and 47 monitor wells. This is tremendous amount of metering and measuring within a basically contiguous area.

Drought Contingency Plan

A contingency plan to cope with the effects of water supply shortages due to climatic or

other conditions will be developed by the District and will be adopted by the Board after notice and hearing. In developing the contingency plan, the District will consider the economic effect of conservation measures upon all water resource user groups, the local implications of the degree and effect of changes in water storage conditions, the unique hydrogeologic conditions of the aquifer and the appropriate conditions under which to implement the drought contingency plan.

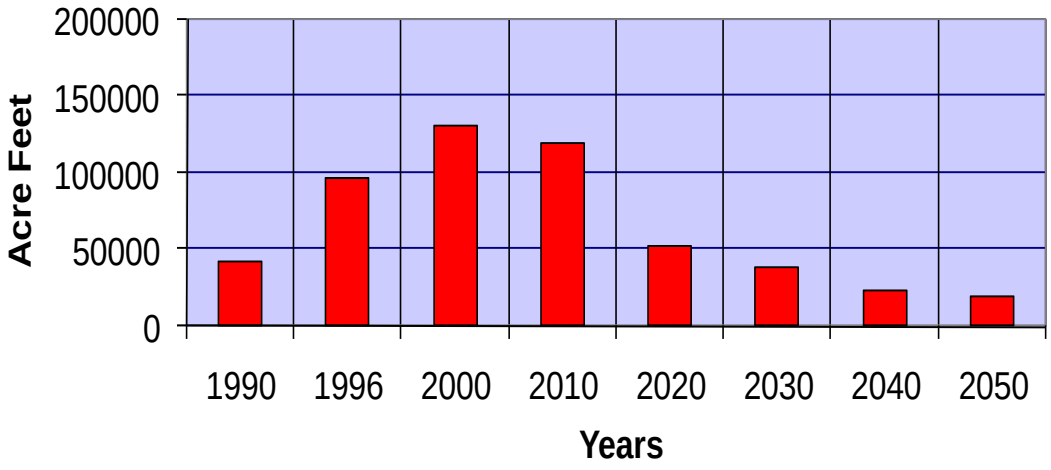
The District will employ additional technical specialists at its disposal to evaluate the resources available within the district and to determine the effectiveness of regulatory or conservation measures. A public or private user may appeal to the Board for discretion in enforcement of the provisions of the water supply deficit contingency plan on grounds of adverse economic hardship or unique local conditions. The exercise of said discretion by the Board of directors shall not be construed as limiting the power of the Board.

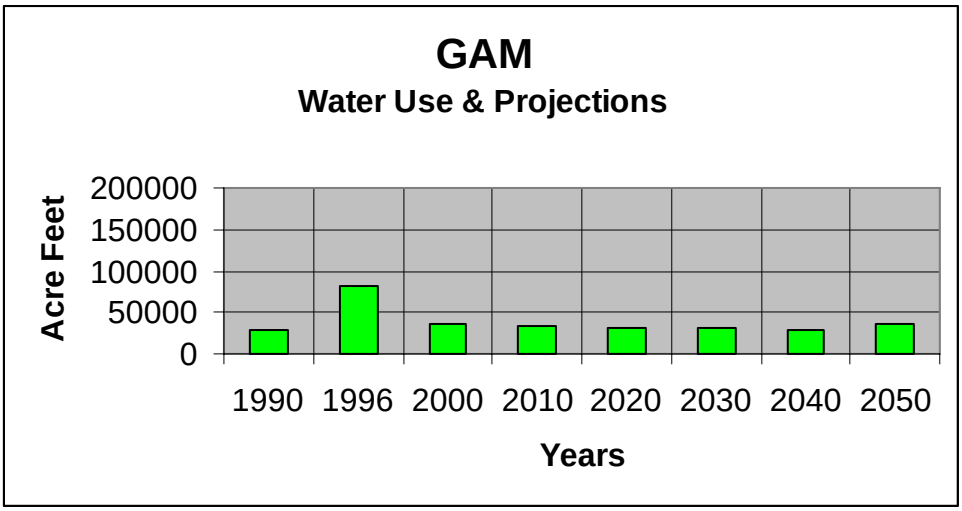
Actions, Procedures, Performances and Avoidance for Implementation of District Management Plan and Future Board Review

The District will implement the provisions of the ~~certified~~approved management plan and will utilize the provisions of this plan as a guidepost for determining the direction or priority for District activities. Operations, agreements, and planning efforts of the District will be consistent with this plan. The District will seek the cooperation of all interested parties in the implementation of this plan. **The District will adopt all Management Plans by means of a District Board Resolution. The District will provide "Notice and Hearing" as prescribed by District Rule 14.1 Rule-Making Hearings and provide evidence to the TWDB of such happenings.** ~~This plan is for a 10~~The District will coordinate with all surface water management entities in the District which includes Canadian River Municipal Water Authority, Brazos River Authority, and Colorado River Municipal Water District. This plan is for a 5 year planning period; however, the Board of Directors of Mesa UWCD may review the plan annually and re-adopt the plan with or without revisions at least every five (5) years. At anytime the Rules of Mesa UWCD may be found on the District website www.mesauwcd.org. A digital copy of Management Plan III may also be found at the same website.

Mesa UWCD

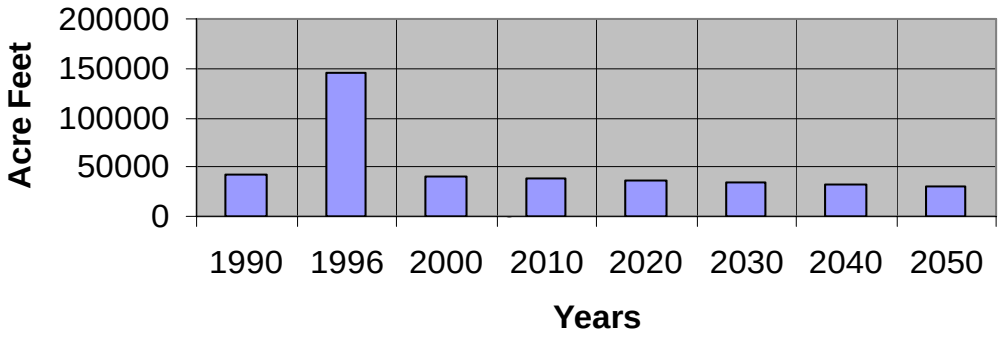
Water Use and Projections





Region O Plan

Water Use & Projections



Projected Demands for Water in Mesa UWCD

The TWDB published groundwater demand forecasts in their planning document "*1996 Consensus Texas Water Plan"*. The Management Plan I for Mesa UWCD was based upon this document and related files of the Texas Water Development Board. This data was necessarily used until alternative numbers could be generated by the District. The TWDB data had projected that the total water demands for Mesa UWCD to be 32,274 acre-feet per year by 2040. This estimate is based on projections of the following breakdown and population statistics. Lamesa will have a municipal demand of 2,294 acre-feet, O'Donnell, Ackerly, and Welch 386 Acre-feet. Manufacturing, Mining, and Livestock account for 311 acre-feet. Irrigation is projected to use 29,521 acre-feet.

One of the projects the District under Management Plan I sought to pursue was to develop a data base of the most current information reflecting the use and availability of groundwater in the District. Weather conditions have been so very different in the past several years and this dramatic change has caused data used in prior studies to be way out of kilter. During the mid 1980's the District experienced huge rainfall amounts. These years were known as the 100 year rains. In contrast, during the period of Management Plan I, the 100 year rains have been followed by drought conditions in the ~~last~~ 6 of 8 years from 1996 through 2003. Management Plan II has had all conditions. The water levels in 2004 were -2.95', 2005 +1.58, 2006 -1.58', 2007 -0.98, and 2008 +2.71. This is definitely a mixed bag of data to start of District Management Plan III.

Likewise the agriculture patterns have changed drastically in the past several years. There is no possible way projections made twenty years ago, prior to the creation of the District, could have predicted the enormous increase in irrigation acres in Dawson County. The data we were using in the development of Management Plan I was the best data available and we greatly appreciate the hard work TWDB has given over the many years to perform these studies and prepare projections and overviews.

However, we believe it is imperative for the District to have and be able to use better data in preparing the Management Plan II for the year 2004~~.~~ as well as for District Management Plan III for the year 2009. We trust the TWDB will continue to guide and assist our District toward developing accurate and precise overviews and projections as a result of the new and ever changing conditions: whereby, the new data the District has been able to assimilate during this period of time when changes have been running wild and rampant in the southern region of the Ogallala Aquifer. The District will continue requests for Region O water planning group to consider the southern region of the Ogallala Aquifer as an area where additional studies need to be performed.

The new development of "best available data" part of Management Plan I and Management Plan II has become a reality. With the very capable assistance of the TWDB, the Board of Directors believes, Mesa UWCD now has the "best data available" to utilize in the preparation of District Management Plan ~~II.~~III.

Demand and Supply Issues and Resolutions

Based on supply and demand calculations and projections based on estimates from available data it appears issues will arise as the Management Plan I ~~has~~and Management Plan II have been implemented over the past ~~5~~10 years. The District used Texas Water Development Board's Report 341 *The High Plains Aquifer System of Texas, 1980 to 1990 Overview and Projections, September 1993*. Management Plan I used the Table 3. Volume of Water in Storage for Future Periods, South Model, page 13. The estimated usable amount of groundwater available projected for the year 2040 is 4.77 million acre-feet less .7 million acre-feet shown to be unrecoverable, or a estimated net volume of 4,070,000 acre-feet. ~~This management plan will use~~Management Plan II used Table 5, page 19, reflecting USGS recharge rate of 3,921 acre feet per year for the South Model. TWDB report 288 uses 24,600 acre feet per year as the recharge rate. Estimates of annual recharge vary considerably. The District is in agreement with the authors of Report 341 which state *"The 1990 revision of the TWDB High Plains aquifer model resulted in an increased awareness that, especially in the southern region, recharge to the aquifer is more variable than previously envisioned. Further study is needed to improve simulation of the various recharge mechanisms that occur within the aquifer".*

Recharge of the Ogallala Aquifer in Mesa UWCD is very difficult to understand. Studies have suggested recharge ranging from 0.01 (Stone, 1984) to 0.833 (Knowles, 1984) inches per year. However, after the record setting rainfall in Dawson County in the mid 1980's, evidence may be discovered in future studies to increase that amount greatly. The District believes that as a result of the data collected in the Aquifer Evaluation Program (AEP) as discussed in previous text, evidence of the accelerated recharge is a great possibility.

Texas Water Development Board has provided the District for preparation of District Management Plan III, ***GAM Run 08-46 Report.*** This run shows the "Estimated annual amount of recharge from precipitation" to be 61,253 acre feet per year. This amount of recharge is more than 2 times the amount from Report 288. The estimated net inflow into the
District is 5,299 acre ft. and out flow is 9,925 acre ft. The outflow is made up of 3,502 acre feet discharging to surface water and springs along with an estimated 6,423 acre flow "out of District". Using these numbers it appears that the net water balance from GAM Run 08-46 is a recharge of 56,627 acre feet. Be aware, the model did not consider cross-formational flow, and therefore, no estimate was provided in the ***GAM Run 08-46 report*** nor in District Management Plan III.

The much larger question concerning "Estimated annual amount of recharge from precipitation" has to do with the water level rises in the years 2005 and 2008. The Annual Water Level Program for the year 2005 had an average rise over the entire

District of +1.58 foot. The total estimated water use in the crop year prior to the January well measurements was 106,455 acre/feet. The +1.58 foot rise over the 576,000 acres amounts to 910,080 acre feet of recharge plus the 106,455 acre feet that was pumped from the aquifer gives a net water balance of 1,016,535 acre feet.

The Annual Water Level Program for the year 2008 had an average rise over the entire District of +2.71 foot. The total estimated water use in the crop year prior to the January well measurements was 67,742acre/feet. The +2.71 foot rise over the 576,000 acres amounts to 1,560,960 acre feet of recharge plus the 67,742 acre feet of water that was pumped from the aquifer gives a net water balance of 1,628,702 acre feet.
Somewhere in this conglomerate of numbers there needs to be some sort of rational explanation for better understanding the recharge numbers. The logistics of the Annual Water Level Monitor Wells are located throughout the District represented by the 576,000 acres. However, the amount of groundwater pumped from the Ogallala Aquifer is done so over only approximately 91,000 acres. To further complicate this scenario is the fact that 187 of the Annual Water Level Monitoring Wells are within ½ mile of active irrigation systems. The remaining 29 wells are located in the dryland areas of the District. The measurements in 2008 showed that the 187 wells in irrigated area had an average rise of +2.81 feet and the rise in the dryland areas was only +1.12 feet.

The measurements in 2008 were just opposite. The dryland areas had 28 wells rise an average of +3.19 feet and only 1 well decline -5.17 feet. That was only the third time in 17 years that particular well had declined. These scenario's continue to prove the fact that "groundwater in Mesa UWCD is mysterious and occult".

The District is well aware of a large number of cases where water availability changes in Dawson County have occurred. Areas which have historically been capable of only producing stock water now have the capabilities of producing irrigation water. Residents in these particular areas, as well as through out the District, are very concerned as to where this new found irrigation water has come from. There was a large earth quake at Frankel City, Texas in the early 1990's which is less than 50 miles away. Could this have caused geological shifts underground and opened up new passage ways for groundwater to enter the District? The District is very interested in promoting additional studies in an attempt to help answer these unusual phenomenons.

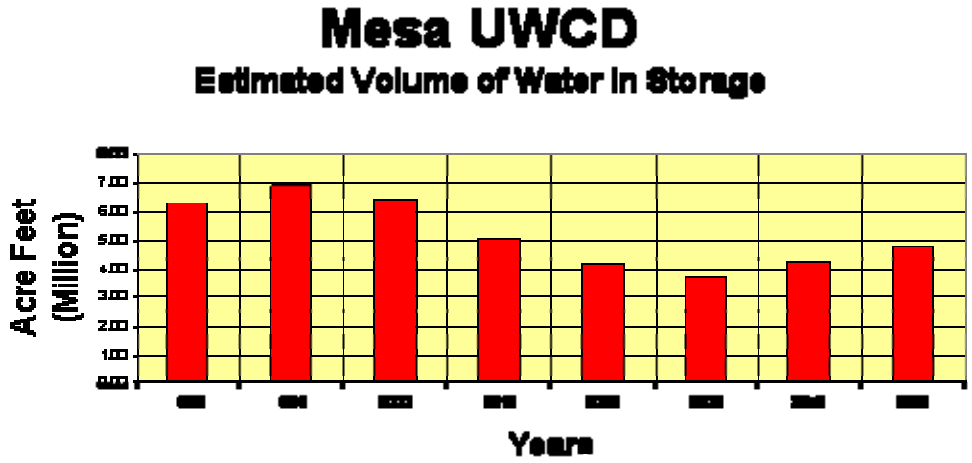
Artificial recharge in the District is not generally a planned operation. There is no recharge project designed for the purpose of increasing natural or artificial recharge. However, farming practices have changed the topography of playa lakes over the years. The bottoms of these small lakes have filled with top soil washed in from nearby farms. Consequently, these lakes are shallower and the total amount of run-off accumulations from rainfall spreads over a much larger surface area. We call this the "do nut" effect.

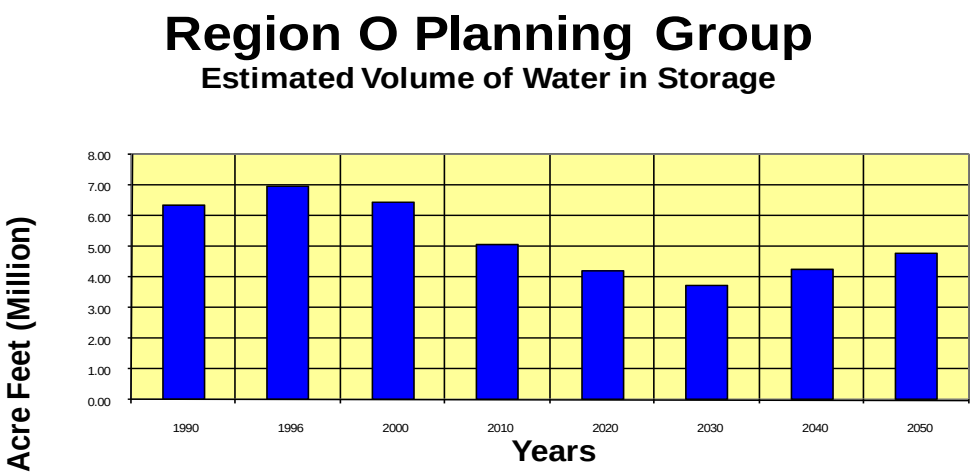
The "do nut" effect is a result of evolving playa lakes. The small clay lined bottom of a playa lake which was designed to hold and prevent the impounded water from percolating downward has changed. The lake is now much larger and there is no clay

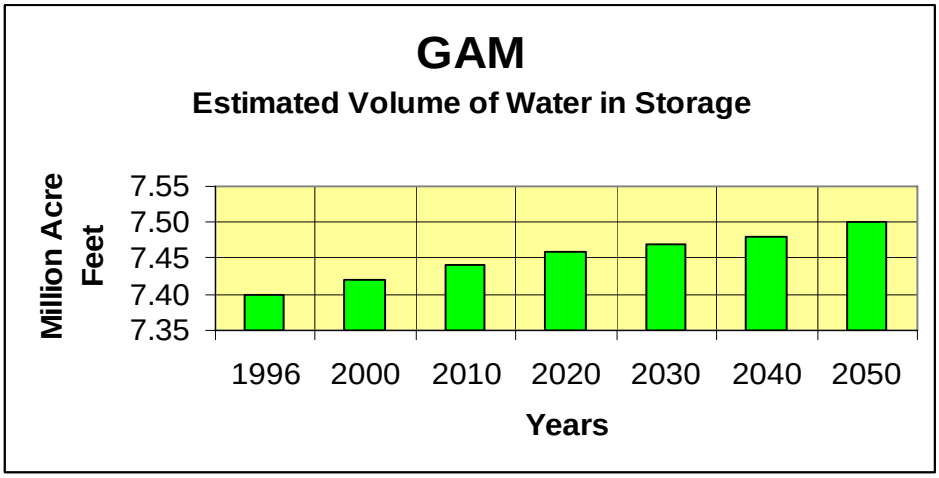
bottom under the largest portion of the run off collection lake. As a result, the water will travel through the sandy soils downward toward the aquifer at a rapid rate. The rapid rate of drying up the playa lakes adds more water to the aquifer because it reduces the amount of evaporation normally calculated for shallow water bodies in the sunshine. This much larger area of water outside the clay bottom also adds to the recharge rate caused by the very large volume of water which can be absorbed by the soils. The local producers try to prevent excessive run off water from washing across their fields toward these lakes, but it is virtually impossible. Most of the local farmers employ best management practices such as furrow dikes, contour rows, and terracing in attempts to better control the run off problems. The lakes which form after fast heavy rainfall events will remain as the most feasible methods of increasing the natural recharge. This "do nut" natural recharge method is definitely increasing the water levels in Mesa UWCD.

In Management Plan I and Management Plan II the District was very cautious and skeptical of the projected water supply figures, not as a result of the studies TWDB has performed, but because of the tremendous changes which were occurring in the aquifer during and shortly after the studies were completed. Another major concern the District had with using these numbers was the huge increase in irrigated acres that have been converted from dryland to irrigated farming during and since the completion of the study. The number of new center pivot irrigation systems which have been added into the county, converting dryland, where no groundwater is mined, to irrigated acres, which use several acre feet/ per acre/per year, have increased by over 400%. However, the District believes that since the certification of Management Plan I, there has been adequate time to develop new numbers to be used in the ~~certification~~approval of District Management Plan III. Therefore, the District will use the demand and supply totals for year 2050 which will appear ~~as follows:~~on page 25:

Projected Supplies of Water 2050	
Groundwater in Storage-Ogallala Aquifer	4,770,000 acre feet
Surface water available to City of Lamesa	2,528 acre feet
Total Projected Supply	4,772,528 acre feet
Projected Demands for Water 2050	
Dawson County total groundwater use	32,274 acre feet
City of Lamesa Surface water use	1,795 acre feet
Total Projected Demand	33,069 acre feet
Surplus (shortage)	4,739,459 acre feet


Mesa UWCD
Estimated Volume of Water in Storage
Acre Feet (Million)
Years


Region O Planning Group
Estimated Volume of Water in Storage
Acre Feet (Million)
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1990
1996
2000
2010
2020
2030
2040
2050
Years


GAM
Estimated Volume of Water in Storage
Million Acre Feet
7.55
7.50
7.45
7.40
7.35
1996
2000
2010
2020
2030
2040
2050
Years

Estimated surface water available for the City of Lamesa come from a "letter" report dated June 17, 1998 from Canadian River Municipal Water Authority. The estimated projection numbers indicating this large amount of surplus water available is very encouraging. However, the District will be continually working to conserve and protect the Ogallala Aquifer from extreme declines. Texas Water Development Board Report 341 entitled The High plains Aquifer System of Texas, 1980 to 1990, Overview and Projections, September 1993 was the basis for our Management Plan I. and Management Plan II. The District agrees completely with the recommendations of the authors on page 32 of Report 341 which states: *Cooperative efforts should be made with the local underground water conservation districts to refine the base data from the model into smaller regional models. These models can be used to refine ground-water availability, evaluate efficient water-use management techniques, and demonstrate the effects of local pumpage scenarios on the aquifer. The information from such efforts would then be available to those responsible for managing this precious resource.*

Management of Groundwater Supplies

For a "base number", the District will use the figures published in Texas Water Development Board report 341, Table 3 indicates an estimate of the existing total useable amount of groundwater in the District in 1990 to be approximately 6 million acre-feet with .7 million acre-feet to be subtracted as unrecoverable, results in an estimated net of 5.3 million acre-feet. The District will manage the existing estimated supply of 6.1785.654 million acre-feet of groundwater within the District for year 20032008 in order to conserve the resource while seeking to maintain the economic viability of all resource users groups, public and private. In consideration of the economic and cultural activities occurring within the District, the District will identify and engage in such activities and practices, that if implemented would result in a reduction of groundwater use.

The District has established and maintains an observation network (190(230 monitor wells) in order to monitor changing storage conditions of groundwater supplies within the District. The District annually makes an assessment of water supply and groundwater storage conditions and reports those conditions to the TWDB and to the public. The 6.178 million acre-feet supply was derived by taking the year 2000 volume of water in storage and subtracting the usage from graph on page 79 for the years 2001 and 2002 and adding back into the volume the recharge of 3,921 per year as described on page 17 and 18. Since the 2002 usage was calculated at a volume of 6.178 million acre feet, the use and recharge up through 2008 provides a net reduction of volume of water in storage in 2003 of 119,778, 2004 of 108,351, 2005 of 108,104, 2006 of 123,030 and 2007 of 63,821. This leaves the volume of water in storage for the beginning of District Management Plan III of 5,654,916 acre feet.

District Management Plan III will reluctantly adopt the net water balance from recharge as presented by TWDB GAM Run 08-46 by taking the recharge from precipitation of 61,253 acre ft. and adding to that amount the estimated inflow of 5,299 acre ft. and then

subtracting the out flows totaling 9,925 acre ft. for a net annual recharge of 56,627 acre ft. The District truly believes the GAM Model we are presently working under must be up dated to the point that the annual water level results provided by this District and other GCD in GMA #2 to the TWDB will be entered into the model in order for immediate changes to be reflected in the model. One of the major concerns the District posses is what is the amount of recharge to the Ogallala Aquifer in Mesa UWCD are has there been as a result of the +1.58' feet rise in 2005 and the +2.71 feet rise in 2008. There are 576,000 acres in the District so has the rise of 1.58' all over the district resulted in a recharge amount of 910,000 acre ft. for 2005? What about the 2.71' rise in 2008, another recharge amount of 1,561,000 acre ft.? The aquifer definitely had more water in storage after 2005 and even much more after 2008. When we are able to utilize this data, then we will be able to be using the best data available. These scenarios must be addressed in the near future. The MAG numbers established by TWDB cannot be valid until the GAM takes into consideration all the factors representing change in Mesa UWCD.

The District has adopted rules to regulate groundwater withdrawals by means of spacing (Rule #5 Spacing Requirements) and production limits (Rule #6 Production Limitations). The District may deny a water well operating permit or limit groundwater withdrawals in accordance with the guidelines stated in the District (Rule 7.3 Production Use Measurement Area). In making a determination to deny a permit or limit groundwater withdrawals, the District will consider the Rules of the District (Rule 10.3(a) Standard Operating Permit Provisions. In making a determination to deny a permit or limit groundwater withdrawals, the District will consider the public benefit against individual hardship after considering all appropriate testimony (Rule 14.1(a) Permit Hearings).

The District will enforce the terms and conditions of permits and rules of the District (Rule 15.3 Rule Enforcement). All of the District Well Registration/Water Well Drilling Permit Applications include the requirements of §36.113 and §36.1131. The District Rule Book includes all the specifications for the actions, procedures, performances and avoidance necessary for the District to effectuate the management plan.

Regional Water Plan

The Management Plan I was adopted prior to the development of the regional management plan for Region O (Llano Estacado Region). As required by §36.1071(b) this management plan and any amendments thereon shall be consistent with the ~~certified~~ regional water plan. Now that a regional water plan has been adopted, the District shall address water supply use and projections as well as groundwater in storage in a manner that very well may be in conflict with the appropriate approved regional water plan which must be approved under Section 16.053. Senate Bill # 1 intended for water management to be a bottom up approach. Therefore, the District

believes the regional planning group will consider this local ~~certified,~~plan, Mesa UWCD Management Plan II in the development of the regional water plan. Considering this local Management Plan II, will hopefully, meet the intent of Senate Bill #1 and; consequently, result in a regional management plan which is consistent with Mesa UWCD local Management Plan II, resulting in the protection of the local control of groundwater management by the local people who elected the Board of Directors to operate the District. Regional Planning Group O is in the process of developing a new plan as District Management Plan III is being prepared. The new District Management Plan IV which will have the Desired Future Conditions (DFC) and Managed Available Groundwater (MAG) will be prepared just as soon as the DFC is established by Groundwater Conservation Districts in GMA2.

Texas Water Code Chapter 36.1071 (b) clearly states *"After January 5, 2002, a district management plan, or any amendment to a district management plan, shall be developed by the district using the district's best available data and forwarded to the regional water planning group for consideration in their planning process"*. Texas Water Code Chapter 36.1071 (e) (4) further states *"address water supply needs in a manner that is not in conflict with the appropriate approved regional water plan if a water plan has been approved under Section 16.053"*. The Board of Directors believes the numbers contained in the *Llano Estacado Regional Water Planning Area, January 2001(Region O)* are in conflict with the numbers contained in the Management Plan II of Mesa UWCD. The Board of Directors in official board action on August 21,2003 voted to use the data collected and analyzed by Mesa UWCD as the best data available in preparing the amended Management Plan II.

The conflicting numbers between the Region O Plan and Management Plan II arise from the "Water Use and Projections". Look at the graphs on Page ~~16.~~25. The graphs are entitled Mesa UWCD (top of page) and Region O (bottom of page). One can quickly see that the major differences in the numbers occur between 1996 and 2010. Under the discussion of "Groundwater Use in Mesa UWCD" page ~~7,~~9, one can see that the usage of groundwater in 1996 was estimated at 85,925 acre-ft/year. This usage number was determined by the District by calculating the total number of irrigated acres of 49,100 by the average usage of 1.75 acre-ft. The 85,925 acre-ft/yr is only 18,208 acre-ft/yr greater than the 1995 pumpage total 67,117 acre-ft/yr as determined by the TWDB's *Estimated Groundwater Pumpage Summary by Major Aquifer*.

The numbers in the Region O Plan can be found on page 4-22 of the *Llano Estacado Regional Water Planning Area, January 2001(Region O)*. The number shown for 1996 amount to143,326 acre-ft/yr. The District does not believe these numbers to be accurate. Using the 49,100 acres of irrigated land in the District the application rate would need to be in excess of 2.91 acre-ft. In contrast, if one turns the numbers around the other way, then at an application rate of 1.75 acre-ft there would needed to have been 81,900 acres of irrigated land to have used this large number of water. The large spike on the graph of Region O Plan is just not understandable nor justifiable.

The District does not accept the numbers for the 2000 year as the best data available. Once again we reference the chart on page ~~7.~~9. For the year 2000 the usage is 148,856 acre-ft/yr. During the year 2000 there were 70,884 irrigated acres in Mesa UWCD. The average water usage was 2.10 acre-ft. The numbers in the Region O Plan found on page 4-22 of the *Llano Estacado Regional Water Planning Area, January 2001(Region O)* indicate the water use for the year 2000 as 46,475 acre-ft. This amount of water demand is just not accurate. Seemingly, there is no possible way this small amount of water could have been used in the year 2000. The District believes the numbers the District gathered, analyzed and used in Management Plan II support these beliefs.

In projecting the demand for groundwater use in the year 2010, the District believes that acreage will continue to decline as well as the quantity of groundwater necessary to grow these crops. Because the water table in Mesa UWCD continues to decline, there will be irrigators who will reduce the number of acres they irrigate. The District forecast for the year 2010 that the acreage will be reduced down to 70,000 acres. Likewise with the steady decline of water levels, the number of acres that has been growing peanuts will decline. The decline in peanut acres will in turn cause the amount of water to be used to also decline. Therefore, the amount of irrigation water used in 2010 is estimated to be 119,000 acre-ft/yr. The numbers in the Region O Plan found on page 4-22 of the *Llano Estacado Regional Water Planning Area, January 2001(Region O)* indicate the number to be only 34,418 acre-ft/yr. Once again the District believes that the usage of irrigation water will be much more than the estimated amount projected by the Region O Plan. This small amount is just not ample to support the irrigated acres that will be planted in the year 2010~~ that is only six (6) years into the future.~~.

The projection for the years 2020, 2030, 2040, and 2050 the District believes that irrigated acreage will continue to decline. As time goes further into the future the numbers grow closer together as indicated on the graphs.

In conclusion, the District trusts that Region O Planning Group will accept these “Water Use and Projection” numbers as the best available data and adopt them in their new planning process. It is worthy to note that the Region O Planning Group numbers for the “Volume of Water in Storage” as shown on page ~~15~~25 are consistent with those of Mesa UWCD shown on the same page.

In preparation of District Management Plan III once again the District Board of Directors voted to use the data of Mesa UWCD as the best available data and therefore not depend on the data in ***Region O Regional Water Plan January 2006***.

State Water Plan

Chapter 36.1071 (e)(3) calls for the management plans of Groundwater Conservation

Districts to include estimates of the following:

A. ***Managed available groundwater in the district, based on the desired future condition established under Section 36.108***.

As of the date of Management Plan III, Groundwater Management Area # 2 has not established the desired future condition. Therefore, the TWDB has not provided Mesa UWCD with the managed available groundwater number. Consequently, Management Plan III cannot estimate the managed available groundwater at this time.

B. ***The amount of groundwater being used within the district on an annual basis***.

2007	67,742 acre-ft/year
2006	126,952 acre-ft/year
2005	108,312 acre-ft/year
2004	106,455 acre-ft/year
2003	123,699 acre-ft/year
2002	125,671 acre-ft/year
2001	139,641 acre-ft/year
2000	148,856 acre-ft/year
1999	150,500 acre-ft/year
1998	158,500 acre-ft/year
1997	119,033 acre-ft/year
1996	85,925 acre-ft/year
1995	67,117 acre-ft/year
1994	51,227 acre-ft/year
1993	67,006 acre-ft/year
1992	39,678 acre-ft/year
1991	47,883 acre-ft/year

The above chart is an estimate of the groundwater used on an annual basis for irrigation as prepared by Mesa UWCD. **The first five years (1991-1995) are taken from the TWDB *Water Uses Survey-Groundwater Pumpage Estimates.*** The State Water Plan for the latest year 2004 that includes an additional use of groundwater of 2,031 acre feet. Therefore, the estimated use of groundwater for 2004 would be 108,486 acre feet. The estimated use for 2005 would be 110,343 acre feet. The estimated use for 2006 would be 128,983 acre feet. The estimated use for 2007 would be 69,773 acre feet.

C. ***The amount of recharge from precipitation, if any, to the groundwater resource within the district.***

Texas Water Development Board has provided the District for preparation of District Management Plan III, ***GAM Run 08-46.*** This run shows the "Estimated annual amount of recharge from precipitation" to be 61,253 acre feet per year.

D. ***For each aquifer, the annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams and rivers.***

The outflow is made up of an estimated 3,502 acre feet discharging to surface water and springs **as shown in GAM 08-46 Report**.

E. ***The annual volume of flow into and out of the district within each aquifer and between aquifers in the district, if a GAM is available.***

The estimated net inflow into the District is 5,299 acre ft. and out flow is 9,925 acre ft. The outflow is made up of 3,502 acre feet discharging to surface water and springs along with an estimated 6,423 acre flow "out of District". Using these numbers it appears that the net water balance from GAM Run 08-46 is a recharge of 56,627 acre feet. Be aware, the model did not consider cross-formational flow, and therefore, no estimate was provided in the ***GAM Run 08-46 Report*** nor in District Management Plan III.

F. The projected surface water supply in the district according to the most recent adopted state water plan.

RWPG	Water User Group	County	River Basin	Source Name	2000	2010	2020	2030	2040	2050	2060
O	Lamesa	Dawson	Colorado	Meredith Lake/Reservoir	1,656	1,656	1,656	1,656	1,656	1,656	1,656
O	O'Donnell	Dawson	Brazos	Meredith Lake/Reservoir	38	38	38	38	38	38	38

O	Livestock	Dawson	Brazos	Livestock Local Supply	1	1	2	1	2	2	2
O	Livestock	Dawson	Colorado	Livestock Local Supply	211	154	157	161	165	169	173
Total Projected Surface Water Supplies (acre-feet per year) =					**1,906**	**1,849**	**1,853**	**1,856**	**1,861**	**1,865**	**1,869**

The above Projected Surface Water Supplies table of the 2007 State Water Plan indicates a very small amount of Surface Water is available in Mesa UWCD.

G ***The projected*** **total** ***water supply and*** **projected total water** ***demand for water within the district*** **according to the most recent adopted state water plan..**

~~ESTIMATED~~ **PROJECTED TOTAL WATER** DEMAND

RWPG	Water User Group	County	River Basin	2010	2020	2030	2040	2050	2060
O	Lamesa	Dawson	Colorado	2,540	2,573	2,602	2,603	2,529	2,433
O	O'Donnell	Dawson	Brazos	17	17	17	17	17	16
O	County Other	Dawson	Brazos	18	18	19	18	18	17
O	County Other	Dawson	Colorado	610	612	616	607	587	565
O	Manufacturing	Dawson	Colorado	119	129	137	144	150	162
O	Mining	Dawson	Colorado	1,624	779	455	195	0	0
O	Irrigation	Dawson	Brazos	1,378	1,300	1,227	1,158	1,092	1,031
O	Irrigation	Dawson	Colorado	136,425	128,736	121,478	114,628	108,168	102,071
O	Livestock	Dawson	Brazos	1	1	1	1	1	1
O	Livestock	Dawson	Colorado	154	157	161	165	169	173
Total Projected Water Demands (acre-feet per year) =				**142,886**	**134,322**	**126,713**	**119,536**	**112,731**	**106,469**

The above Projected Total Water Demand table of the 2007 State Water Plan estimates the total demand for water from surface water and groundwater.

~~ESTIMATED~~ **PROJECTED WATER** ~~SUPPLY~~ **NEEDS**

RWPG	WUG	County	River Basin	2010	2020	2030	2040	2050	2060
O	Lamesa	Dawson	Colorado	553	463	383	336	169	228
O	O'Donnell	Dawson	Brazos	41	41	41	41	41	42

O	County Other	Dawson	Brazos	0	0	0	0	0	0
O	County Other	Dawson	Colorado	0	0	0	0	0	0
O	Manufacturing	Dawson	Colorado	0	0	0	0	0	0
O	Mining	Dawson	Colorado	0	0	0	0	0	0
O	Irrigation	Dawson	Brazos	-1,377	-1,299	-1,227	-1,158	-1,092	-1,031
O	Irrigation	Dawson	Colorado	-94,404	-93,513	-88,858	-84,984	-78,305	-72,209
O	Livestock	Dawson	Brazos	0	1	0	1	1	1
O	Livestock	Dawson	Colorado	0	0	0	0	0	0
Total Projected Water Needs (acre-feet per year) =				**-95,187**	**-94,307**	**-89,661**	**-85,764**	**-79,186**	**-72,969**

The above Projected Water Needs table of the 2007 State Water Plan indicates a very large amount of irrigation water shortages in Mesa UWCD. The negative numbers indicate a shortage, or the difference in the amount represented by the Projected Water Demand and Irrigation Water Supplies shown on Table 4.4-8 (page 4-110) Llano Estacado Regional Water Plan. The District understands this unmet need to be nothing more than a calculation which cannot be met by the irrigated producers. The amount of groundwater being used within the district on an annual basis as indicated in the B table above than the Irrigation Water Supply numbers indicated in the above referenced Llano Estacado Regional Water Plan. The shortage can be explained as a result of the supply in 2000 of 148,713 (acft) dropping to a supply of only 42,842 (acft) in 2010, page 4-110 Llano Estacado Regional Water Plan. Whatever "it" was that caused the loss of 100,000 (acft) during that 10 year period is the "it" that is responsible for the shortages indicated in the Projected Water Needs table. The prior 5 year average irrigation usage has been 106,632 (acft), so apparently there is no 95,187 (acft) shortage.

Projected Water Management Strategies

	WUG	WUG County	River Basin	Water Management Strategy	Source Name	Source County	2010	2020	2030	2040	2050	2060
	Lamesa	Dawson	Color ado	Municipal Water Conservation	Cons	Dawson	212	400	501	471	448	431
	Irrigation	Dawson	Color ado	Irrigation Water Conservation	Cons	Dawson	1,365	1,228	1,105	995	895	806
Total Projected Water Management Strategies (acre-feet per year) =							**1,577**	**1,628**	**1,606**	**1,466**	**1,343**	**1,237**

The above Projected Water Management Strategies table of the 2007 State Water Plan which shows the acre feet of water that will be conserved by municipal and irrigation conservation strategies.

GOALS, MANAGEMENT OBJECTIVES, PERFORMANCE STANDARDS, AND METHODOLOGY TO EVALUATE PROGRESS

Goal 1.0 Implement Management Strategies by March 1~~, 2004~~ 2009 to Protect and Enhance the Quantity of Usable Quality Ground~~water~~ by Providing the Most Efficient Use of Groundwater.

Management Objective

1.1A Each year the District will provide informative speakers to schools, civic groups, social clubs, and organizations for presentations to inform a minimum of 25 citizens on the activities and programs, the geology and hydrology of groundwater, and the principles of water conservation relating to the best management practices for the efficient use of groundwater.

Performance Standards

1.1aa ~~Number~~Prepare a list indicating the names of citizens in attendance at District presentations concerning the principals of water conservation relating to the best management practices for the efficient use of groundwater each year.

Methodology

Annually, the district manager will prepare and present a report to the Board of Directors on District performances in regards to achieving Goal 1.1. The report will include the number of instances each activity was engaged in during the year, referenced to the expenditure of staff time and budget so that the effectiveness and efficiency of each activity may be evaluated. The report will be maintained on file at the District office.

Management Objective

1.2A Annually, in an effort to emphasize the efficient use of groundwater, the District will operate an Aquifer Evaluation Program (AEP) that will identify the changes in the aquifer water levels as a result of the accurate measurement of the irrigation water being pumped from the aquifer.

Performance Standards

1.2aa Establish a water use measurement program with more than ~~80~~150 water use measurements devices installed in irrigation distribution systems.

1.2ab Establish an aquifer water level measurement program with more than ~~75~~95 non-pumping monitor wells within ½ mile of irrigated systems.

1.2ac In addition to the measurement of the non-pumping wells in irrigated area in the "annual water level measurement program", measure the wells more than ~~4~~2 times during the growing season when the application of irrigation water is most prevalent.

1.2ad Read the water use measurement devices more than ~~5~~2 times during the year.

1.2ae Send to the producers a report indicating the water use for each of the measurement periods in addition to a cumulative total for a year to date usage total.

1.2af Send to the TWDB a report for each measurement period indicating the water use for each site during that period of time.

1.2ag Record the water level measurements in the field data book and record the data on a map of the district that shows the approximate location of the well site.

1.2ah Send to the TWDB a report for each measurement period indicating the water level measurement.

1.2ai Include the "non-pumping wells in irrigated area" as a part of the "annual water level monitoring program" that is sent to the TWDB in January of each year.

Methodology

A. Prepare a report reflecting the results of the AEP monitoring program.
B. Present the annual report to the Board.
C. After the first annual report, the District will provide a yearly comparison report as the procedure for tracking progress on an annual basis.

Management Objective

1.3A The District will annually operate the Aquifer Evaluation Program at an average cost to the District of less than $50 per well.

Performance Standards

1.3aa Record the total miles driven, to measure the "non-pumping wells in irrigated area" and to read the measuring devices, for ~~both~~ the vehicle ~~and~~

~~dirt bike.~~s used.

1.3ab Record the hours spent measuring the wells and reading the meters.

1.3ac Record other expenses necessary to operate the program

1.3ad Prepare a report that shows the average cost per site to operate the program.

Methodology

A. Prepare a report reflecting the results of the AEP monitoring program.

B. Present the annual report to the Board.

C. After the first annual report, the District will provide a yearly comparison report as the procedure for tracking progress on an annual basis.

Goal 2.0 Implement Management Maneuvers to Control and Prevent the Waste of Groundwater by March 1, ~~2004.~~2009.

Management Objective

2.1A ~~Annually~~ The District will annually inventory, inspect, and evaluate ~~50%~~25% of the new well sites the District has permitted or registered to control and prevent pollution to the groundwater from deleterious matter admitted from the ground surface because of sub standard well completion practices.

Performance Standards

2.1aa Record the number of new well sites in the District each year.

2.1ab Record the number of new well sites the District inventoried, inspected, and evaluated during the year to control and prevent pollution a waste of groundwater each year.

Methodology

A. Prepare a report reflecting the total number of new well sites in the District for the year.

B. The report will reflect the number of new well sites the District Inventoried, inspected, and evaluated during the year to control and prevent pollution a waste of groundwater for the year. The report will show the percentage of new well sites the District has permitted or registered to control and prevent pollution to the groundwater from deleterious matter admitted from the ground surface because of sub standard well completion practices.

C. Present the annual report to the Board.

D. After the first annual report, the District will provide a yearly comparison report as the procedure for tracking progress on an annual basis.

Management Objective

2.2A Annually the District will insure the proper closure of ~~90%~~75% of the open or uncovered wells which have been discovered or reported to prevent and control waste as a result of polluting the groundwater.

Performance Standards

2.2aa Record the number of wells discovered or reported during the year that needed proper closure.

2.2ab Record the number of wells that were properly closed each year.

Management Objective

2.3A Each year the District will expend ~~80~~40 staff hours in identifying, investigating, and seeking to prevent and control waste of groundwater by halting wasteful practices which allow groundwater to escape into any river, creek, natural watercourse, depression, lake, reservoir, drain, sewer, street, highway, road, or ditch, or onto land other than that of the well owner, unless such discharge is authorized.

Performance Standards

2.3aa Record the number of staff hours the District expended to identify and investigate seeking to control waste for the year.

Methodology

Annually, the district manager will prepare and present a report to the Board of Directors on District performances in regards to achieving ~~Goal~~Management Objective 2.2A and ~~2.3.~~Management Objective 2.3A. The report will include the number of instances each activity was engaged in during the year, referenced to the expenditure of staff time and budget so that the effectiveness and efficiency of each activity may be evaluated. The report will be maintained on file at the District office.

Goal 3.0 Implement Management Maneuvers to address conservation of Groundwater by March 1, ~~2004.~~2009.

Management Objective

3.1A Measure the monitor wells designated in the water level monitoring program to determine the change in the water level of the Ogallala aquifer on an annual basis.

Performance Standards

3.1aa Develop a network of ~~170~~220 or more water level measurement wells.
3.1ab Mark 90% of the measurement wells on USGS 7 ½ minute topo maps to assure adequate coverage with emphasis on water usage in each quadrant.
3.1ac Measure ~~90%~~75% of the measurement wells annually.
3.1ad Insure greater accuracy by measuring the wells within ~~20~~30 days of the same date as the previous years measurement date.
3.1ae Enter the results of each measurement from the field water level data book into the computer data base within 20 days of completing the measuring procedure.
3.1af Prepare and e-mail a water level report to TWDB within ~~30~~60 days after completing the measuring process.
3.1ag Publish in the local newspaper 1 summary report of the annual water level monitoring program within 2 months of completing the program.
3.1ah Post on the Mesa UWCD website the updated water level report for the current year within 90 days of completing the measurement program.

Methodology

A. Prepare a report reflecting the results of the annual water level monitoring program.
B. Present the annual report to the Board.
C. After the first annual report, the District will provide a yearly comparison report as the procedure for tracking progress on an annual basis.

Management Objective

~~3.1A~~ 3.1A The District will annually operate the water level monitoring program at an average cost to the District of less than $50 per well.

Performance Standards

3.1aa Record the miles driven to measure the water level measurement wells.

3.1ab Record the hours spent measuring the wells.
3.1ac Record the hours used to transfer the data from the field data book to the computer water level program.
3.1ad Record the hours used to prepare and e-mail the levels report to TWDB.
3.1ae Record the hours used to prepare the newspaper summary report.
3.1af Record the cost of publishing the newspaper report.
3.1ag Record the hours used to prepare the annual water level monitoring report.
3.1ah Record the hours used to prepare the letters and charts which will be mailed to the well owners/operators.
3.1ai Record the postage expense for the mail-out.
3.1aj Record any other expenses occurred in the water level measuring program such as equipment, supplies, repairs, or other associated costs.

Methodology

A. Prepare an annual report reflecting the average cost per well to administer the water level monitoring program.
B. Present the annual report to the Board.
C. After the first annual report, the District will provide a yearly comparison report as the procedure for tracking progress on an annual basis.

Management Objective

3.2A At the time the annual water level measurements indicate the two (2) year average of the water level decline in three (3) adjacent monitor wells (excluding the first {1st} year change in a new monitor well) is greater than -5 feet, the Board shall consider the establishment of an Extreme Decline Study Area (EDSA) which is a resolution by the Board to officially name (designate) and draw (delineate) on a map, a square, nine-section area for the purpose of collecting extensive hydrological information on an annual basis from all available and appropriate wells for monitoring in that sector.

Performance Standards

3.2aa Annually, the District will review and study data obtained from the Annual Water Level Monitoring Reports (AWLMR). If evidence of extreme decline exists, comparable to other monitor wells, the Board will consider within 6 months of the new calendar year the need for establishing an EDSA.
3.2ab The District will provide written individual notification to ~~90%~~75% of the known landowners, well owners/operators and water right holds within the EDSA, at least 60 days before the date of public hearing.
3.2ac A summary of available data from the AWLMR will be included in the notification letter mailed to the party at least 60 days before the public

hearing.

3.2ad The Board will call for one or more public hearings to consider the establishment of an EDSA more than 60 days and less than 90 days after the notice has been given.

3.2ae The District will present data from the AWLMR at the hearing.

3.2af The Board will receive testimony from landowners, well owners/operators and water right holders within the proposed area.

3.2ag The Board will receive testimony from the public.

3.2ah The Board will evaluate the proceedings and consider the possibilities to establish an EDSA or continue the efforts of the standard AWLMR.

Methodology

A. The Board will evaluate the proceedings and make a resolution to establish an EDSA.

B. And/or the Board will evaluate the proceedings and determine an EDSA is not necessary at this time.

Management Objective

3.3A. Within one year after an EDSA has been established, the district will implement a data collection system to better understand the groundwater condition within the boundaries of the established EDSA.

Performance Standards

3.3aa The District will measure ~~90%~~75% of available and appropriate monitor wells to determine the water level of the identified measurement wells in the EDSA.

3.3ab The District will measure the wells within ~~20~~30 days of the same date last year to assure greater accuracy.

3.3ac The District will compare subsequent changes in water level on an annual basis and the historical changes for monitor wells with historical data that may be in the EDSA.

3.3ad The District will evaluate and consider climate and environmental events which have occurred during the year.

3.3ae The District will consider changes in water use practices.

3.3af The District will consider any new available information on the use of new technology and/or procedures that may be influencing water level changes.

3.3ag The District will consider any other relevant information that may be contributing to the extreme water declines of the aquifer within the EDSA.

Methodology

A. Prepare an EDSA report for the Board to review and study within the first two board meetings after the annual study is completed.
B. Annually, the Board will make one or more of the following decisions:
   1. Continue monitoring and evaluating data of the area.
   2. Determine the designation of the EDSA is not necessary at this time.
   3. Determine from evidence gathered in the study area that possible over mining of the aquifer is occurring within the EDSA
   4. Begin the process of designating and delineating a Production Use Measurement Area.
C. After the first annual report, the District will provide a yearly comparison report as the procedure for tracking progress on an annual basis.

Management Objective

3.4A Operate the EDSA activities at an annual average cost less than $200 per well.

Performance Standards

3.4aa Develop a District expense report to reflect EDSA expenses.
3.4ab Record the miles driven in the EDSA measurement program.
3.4ac Record the time needed to measure the EDSA monitor wells.
3.4ad Record other expenses incurred in the measuring activities.

Methodology

A. Prepare an annual report reflecting average cost per well to operate EDSA activities.
B. Present the annual report to the Board.
C. After the first annual report, the District will provide a yearly comparison report as the procedure for tracking progress on an annual basis.

Management Objective

3.5A Within one year after the EDSA has indicated possible over production and apparent extreme decline damage to the aquifer, the board will establish a Production Use Measurement Area (PUMA) which is the formal resolution by the Board to officially name (designate) and draw (delineate) on a map, no more than four (4) contiguous ”sections” located within the EDSA whereby, all well/well systems will require an operating permit and a measuring devise will be installed to accurately measure the use of water.

Performance Standards

3.5aa The District will review and study data obtained from the Annual Water Level Monitoring Reports (AWLMR). If evidence of possible and probable excessive mining of the aquifer, compared to other monitor wells in the EDSA, the Board will consider the need for a PUMA.

3.5ab The District will provide notification to 90% of known landowners, well owners/operators and water right holds within the PUMA, at least 60 days before the date of public hearing.

3.5ac A summary of available data from the EDSA will be included in the notification.

3.5ad The Board will call a public hearing to consider the creation of a PUMA.

3.5ae The Board will present data from the EDSA at the hearing.

3.5af The Board will receive testimony from landowners, well owners/operators and water right holders within the proposed PUMA.

3.5ag The Board will receive testimony from landowners, well owners/operators and water right holders within the EDSA.

3.5ah The Board will receive testimony from the public.

3.5ai The Board will evaluate the proceedings and consider a resolution to establish a PUMA.

Methodology

A. The Board will evaluate the proceedings and make a resolution to establish a PUMA.

B. The Board will evaluate the proceedings and determine a PUMA is unnecessary at this time and continue the EDSA.

Management Objective

3.6A Implement an annual operating permit system and a water measurement program for all water users located within the PUMA.

Performance Standards

3.6aa Notify all known landowners, well owner/operator and water right holders of their placement into the PUMA and the requirements for which they are responsible.

3.6ab The District will require all well/well systems operators to file a completed operating permit application prior to operating a well/well system within a

PUMA.

3.6ac The District will provide and install a water measuring device to accurately measure the water used in each operating permit.

3.6ad The District will calculate and print on the permit application the maximum allowable production for each operating permit.

3.6ae The District will read and record meter readings at least every other month during the growing season and notify the permit holder the year to date usage.

3.6af The District will compare meter readings usage results with the operating permit terms and notify the permit holder.

3.6ag The District will prepare renewal operating permits at the end of the existing operating period for all permit holders operating below the permit limitations.

Methodology

A. Prepare an annual report reflecting PUMA activities.

B. Present the annual report to the Board.

C. After the first annual report, the District will provide a yearly comparison report as the procedure for tracking progress on an annual basis.

Management Objective

3.7A The District will annually operate the PUMA program at an average cost to the District of less than $1000 per well.

Performance Standards

3.7aa Develop a District expense report to reflect PUMA expenses.

3.7ab Amortize the cost of the water meters over 3 years.

3.7ac Amortize the installation cost for installing the water meters over a 3 year allocation period.

3.7ad Record maintenance expense for the water meters.

3.7ae Record the mileage required for reading the meters.

3.7af Record the time required to read the meters.

3.7ag Record the time required by office staff to record the readings into computer program.

3.7ah Record the time required by office personnel to prepare the reports.

3.7ai Record the time required by office personnel to prepare renewal permit applications.

Methodology

A. Prepare an annual report reflecting average annual cost per well to operate the PUMA activities.
B. Present the annual report to the Board.
C. After the first annual report, the District will provide a yearly comparison report as the procedure for tracking progress on an annual basis.

Goal 4.0 Implement management maneuvers to address drought conditions by March 1, ~~2004.~~2009.

Management Objective

4.1A ~~Annually~~ The District will annually operate a rainfall observation program.

Performance Standards

4.1aa Establish more than 4 rainfall measurement sites with at least 1 gauge from each of the AEP sites OK Corral, Kentucky, and Southwest.
4.1ab Record the rainfall events for each site in which the rainfall event measures .25 inches or more.
4.1ac During the growing season (May 1-September 1), calculate the number of days since rainfall of equal to or greater than .50 inch has occurred within a consecutive 2 day period; meaning a rain of less than .50 cannot end a drought.
4.1ad In each Sunday edition of the Lamesa Press Reporter, after the ~~20th~~40th day since the last rainfall of equal to or greater than .50 inch has occurred in a consecutive 2 day period, publish a report indicating the total number of days the district is experiencing drought conditions since the last rainfall event.
4.1ae In the drought report published in the Sunday newspaper, print a conservation statement.

Methodology

A Prepare an annual report in which the district manager will develop a report concerning the drought conditions as expressed in Goal 4. The report will contain a copy on the newspaper reports concerning the rainfall and drought conditions within the district. The report will be maintained in the district office.
B. Present the annual report to the Board.

C. After the first annual report, the District will provide a yearly comparison report as the procedure for tracking progress on an annual basis.

Management Goals Determined Not-Applicable

Goals Not-Applicable to Mesa UWCD

1.0 Controlling and preventing subsidence.

The rigid geologic framework of the region precludes subsidence from occurring. *The management goal for controlling and preventing subsidence within the District is therefore not applicable to the operations of the District.*

~~2.0~~2.0 Addressing conjunctive surface water management issues within the District.

There are no surface water impoundments in the District, except for livestock consumption, which could possibly require conjunctive management. At the present time, Mesa UWCD has no jurisdiction over any surface water projects. Likewise, no agency which regulates surface water has the authority to manage groundwater within the territory of this District. *Therefore, the management goal for addressing conjunctive surface water management issues within the District is not applicable to the operations of the District.*

3.0 Addressing natural resource issues which impact the use and availability of groundwater and which are impacted by the use of groundwater in the District.

The District has no documented occurrences of endangered or threatened species dependent upon groundwater. Other issues related to resources-air, water, soil, etc. supplied by nature that are useful to life are likewise not documented. The natural resources of the oil and gas industry are regulated by the Railroad Commission of Texas, and are exempt by Chapter 36.117(e), unless the spacing requirements of the District can be met when space is available. *Therefore, the management goal for addressing natural resource issues which impact the use and availability of groundwater and which are impacted by the use of groundwater in the District is not applicable to the operations of the District.*

~~3.0~~4.0 Addressing ~~conjunctive surface water management issues within the District.~~

~~There are no surface water impoundments in the District, except for livestock consumption, which could possibly require conjunctive management. At the present~~

~~time, Mesa UWCD has no jurisdiction over any surface water~~**recharge enhancement projects**~~. Likewise, no agency~~ **which** ~~regulates surface water has~~**impact the** ~~authority to manage~~ **use and availability of groundwater** ~~within~~**and which are impacted by the use of groundwater in the District.**

The District is unaware of any recharge enhancement projects that are in existence in the area. Because of the ~~territory of this~~ lack of consistent rainfall in the District~~.~~ there are virtually no projects which would be cost effective to pursue in an effort to enhance rainfall. *Therefore, the management goal for addressing ~~conjunctive surface water management issues with~~recharge enhancement projects which impact the use and availability of groundwater and which are impacted by the use of groundwater in the District is not applicable to the operations of the District.*

5.0 Addressing rainwater harvesting projects which impact the use and availability of groundwater and which are impacted by the use of groundwater in the District.

The District is aware of only 1 rainfall harvesting project within the District. This project was instigated over 50 ago when the rural farm house was constructed. The District performs water quality tests for the one project. This project has a reservoir underneath the house for storing rainwater. The District performs a bacteria test annually on the stored rainwater. Because there is only 1 project in the entire 576,000 acres of the District, this is ample proof that the rainwater harvesting projects are not viable in this arid part of the State that is so sparsely populated. *Therefore, the management goal for addressing rainwater harvesting projects which impact the use and availability of groundwater and which are impacted by the use of groundwater in the District is not applicable to the operations of the District.*

6.0 Addressing a precipitation enhancement project which impact the use and availability of groundwater and which are impacted by the use of groundwater in the District.

On several occasions the District has entertained the idea of precipitation enhancement for Dawson County. There are other precipitation enhancement programs around the area. The county due west of the District and the county to the northwest of the District are both in a precipitation enhancement programs. In addition, the East ½ of Dawson County was in the precipitation enhancement program of Upper Colorado River Municipal Water District and now that precipitation enhancement program has been dropped. It is the belief of the citizens that a precipitation enhancement program is not effective in enhancing rainfall in Dawson County and therefore, not cost-effective. *Therefore, the management goal for addressing precipitation enhancement projects which impact the use and availability of groundwater and which are impacted by the use of groundwater in the District is not applicable to the operations of the District.*

7.0 Addressing a brush control project which impact the use and availability of

groundwater and which are impacted by the use of groundwater in the District.

The District is basically an agricultural county with row crops. The total amount of rangeland over the Ogallala Aquifer is only a very small amount. The large number of acres in rangeland where brush control could be effective is outside the Ogallala Aquifer and in an area which has little or no groundwater. There are areas of Salt Cedar around phyla lakes. There are provisions through the EQUIP program for cost share for the removal of Salt Cedar. The District has 3 monitor wells in a particular area where a rather large Salt Cedar removal project has taken place. Contrary to prior beliefs, the changes in water levels have not been significantly affected by the project. *Therefore, the management goal for addressing brush control projects which impact the use and availability of groundwater and which are impacted by the use of groundwater in the District is not applicable to the operations of the District.*

7.0 Addressing in a quantitative manner the desired future conditions of the groundwater resources which impact the use and availability of groundwater and which are impacted by the use of groundwater in the District.

Mesa UWCD Board President Richard Leonard is the voting representative on the Groundwater Management Area #2 planning process. The District is actively participating in the planning for the establishment of a Desired Future Condition. At this time, Groundwater Management Area # 2 has not established the Desired Future Conditions (DFC) of the Ogallala Aquifer. Therefore, the Managed Available Groundwater (MAG) has not been determined by the Texas Water Development Board. At the time the DFC has been established and the MAG has been determined, the District will develop Management Plan IV. *Therefore, the management goal for addressing DFC and MAG which impact the use and availability of groundwater and which are impacted by the use of groundwater in the District is not applicable to the operations of the District at the time of District Management Plan III.*

Definitions and Concepts

"Board" means the Board of Directors of Mesa UWCD.

"District" is Mesa Underground Water Conservation District and those given the responsibility for the execution and performance of District functions and activities.

"Drilling Permit" means a permit for a water well issued or to be issued by the District allowing a water well to be drilled.

"Groundwater" means water located beneath the earth's surface within the District but

does not include water produced with oil in the production of oil and gas.

“Landowner” means the person to whom bears ownership of the land surface area and water rights there under, unless previously sold.

“Operating Permit” means a permit issued within a *Production Use Measurement Area* by the District for a water well, allowing only a specified amount of groundwater to be withdrawn from a water well/well system for a designated period of time.

“Person” includes corporation, individual, organization, government or Governmental subdivision or agency, business trust, trust, partnership, association, or any other legal entity.

“Rule” means the rules of Mesa UWCD adopted May 1, 1997 to achieve the provisions of the District Act.

“Section” means the number section of a survey or block as shown in “Dawson County Farm Plats,” 1996 Edition, (Smith Publishing Co.).

“Well” means any facility, devise, or method used to withdraw groundwater from the groundwater supply within the District.

“Water Rights Holder” means the person other than the landowner who has ownership of the water rights beneath the land surface.

“Well owner” or “Well operator” means the person who owns the land upon which a well is located or is to be located or the person who operates a well or a water distribution system supplied by a well.

“Well system” means a well or group of wells tied to the same distribution system.