Blanco – Pedernales Groundwater Conservation District

GROUNDWATER MANAGEMENT PLAN

Originally Adopted
November 19, 2002

Board of Directors

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At-Large
Bobby Wilson, Vice-President
Precinct 3
Shirley Beck, Secretary-Treasurer
Precinct 4
Tom Murrah
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5th Revision, Adopted
November 20, 2008

Board of Directors

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Precinct 4
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General Manager

Ronald G. Fieseler, PG
manager@blancocountygroundwater.org

Blanco – Pedernales Groundwater Conservation District
Post Office Box 1516
601 W. Main
Johnson City, Texas 78636

(830) 868-9196
(830) 868-0376 FAX

www.blancocountygroundwater.org

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GROUNDWATER MANAGEMENT PLAN

REVISION RECORD

Date Adopted	Effective Date	Affected Sections or General Comments
11/19/02	11/19/02	Original Adoption
02/18/03	02/18/03	Rev. 1: Revisions resulting from TWDB Approval Review
04/15/03	04/15/03	Rev. 2: Revise Table 1, Table 3, & associated text to address TWDB comments
06/05/08	06/05/08	Rev. 3: 5 year statutory review, general revisions, and new Chapter 36 requirements
09/18/08	09/18/08	Rev. 4: Revisions resulting from TWDB Approval Review comments
11/20/08	11/20/08	Rev. 5: Revisions resulting from TWDB Approval Review comments

Recognition of Achievement

This certificate is presented to the

Blanco-Pedernales Groundwater Conservation District

in recognition of completion of the

District Groundwater Management Plan

and approval as mandated by Texas Water Code §36.1071. A review of the management plan has documented that the plan is administratively complete and in compliance with Texas Water Code §36.1071 and 31 TAC 356.

J. Kevin Ward, Executive Administrator
Texas Water Development Board

Number: 54.1
January 7, 2009

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Special Note

The Desired Future Conditions for the Ellenburger, Hickory, Marble Falls, and the Edwards Group of the Edwards Trinity (Plateau) aquifers located within the District boundaries and within Groundwater Management Area 9 has been established; but, the Managed Available Groundwater calculations being done by the Texas Water Development Board are not available at this time. The District is actively working with the other member districts within Groundwater Management Area 9 towards determining the desired future conditions for the Trinity Aquifers. Once these are approved, they will be submitted to the TWDB so that calculations of the managed available groundwater can be calculated.

Groundwater availability quantities currently incorporated in this document are based on quantities published in the Lower Colorado Regional Water Planning Group's Regional Water Plan dated January 2006.

TIME PERIOD FOR THIS PLAN

This plan becomes effective upon adoption by the Blanco-Pedernales Groundwater Conservation District Board of Directors (District Board) and subsequent approval by the Texas Water Development Board (TWDB). This plan incorporates a planning period of ten years in accordance with 31TAC §356.5(a). After five years, the plan will be reviewed for consistency with the applicable Regional Water Plans and the State Water Plan and shall be readopted with or without amendments. The plan may be revised at anytime in order to maintain such consistency or as necessary to address any new or revised data, Groundwater Availability Models, Groundwater Management Area 9 designated Desired Future Conditions and Managed Available Groundwater, or District management strategies.

DISTRICT MISSION

The Blanco-Pedernales Groundwater Conservation District (BPGCD or District) was created under Chapter 36 of the Texas Water Code for the purpose of conserving, preserving, recharging, protecting and preventing waste of groundwater from the aquifers within Blanco County. The District will conduct administrative and technical activities and programs to achieve these purposes. The District will collect and archive water well and aquifer data, regulate water well drilling and production, promote the capping or plugging of abandoned wells, provide information and educational material to local property owners, interact with other governmental or organizational entities, and incorporate other groundwater-related activities that may help meet the purposes of the District. The Texas Hill Country Area, which includes Blanco County, was declared a Critical Groundwater Area by the then Texas Water Commission in 1990. This declaration, now known as the Hill Country Priority Groundwater Management Area (PGMA), gave notice to the residents of the area that water availability and quality will be at risk within the next 50 years.

STATEMENT OF GUIDING PRINCIPLES

The BPGCD was created in order that appropriate groundwater management techniques and strategies could be implemented at the local level to address groundwater issues or problems within the District. The District has considered the Desired Future Conditions and Managed Available Groundwater resulting from the Groundwater Management Area 9 cooperative planning process, the TWDB's Groundwater Availability Modeling tools, public input, and the best and most current site-specific data available to the District in the development of this plan. This plan serves as a guideline the District can follow to ensure greater understanding of local aquifer conditions, development of groundwater management concepts and strategies, and subsequent implementation of appropriate groundwater management policies and Rules.

COMMITMENT TO IMPLEMENT GROUNDWATER MANAGEMENT PLAN

To address potential groundwater quantity and quality issues, the District is committed to, and will actively pursue, the groundwater management strategies identified in this groundwater management plan. The management plan will be coordinated with District Rules, policies, and activities in order to effectively manage and regulate the drilling of wells, production of groundwater within the District, and the possible transfer of water out of the District, encourage conservation practices and efficient water use, develop a drought contingency plan, and provide for the identification of any critical groundwater depletion areas within the District. To the greatest extent practical, the District will cooperate with and coordinate its management plan and regulatory policies with adjacent groundwater districts, Groundwater Management Area 9, Regional Water Planning Groups, and adjacent counties with similar aquifers and/or groundwater usage.

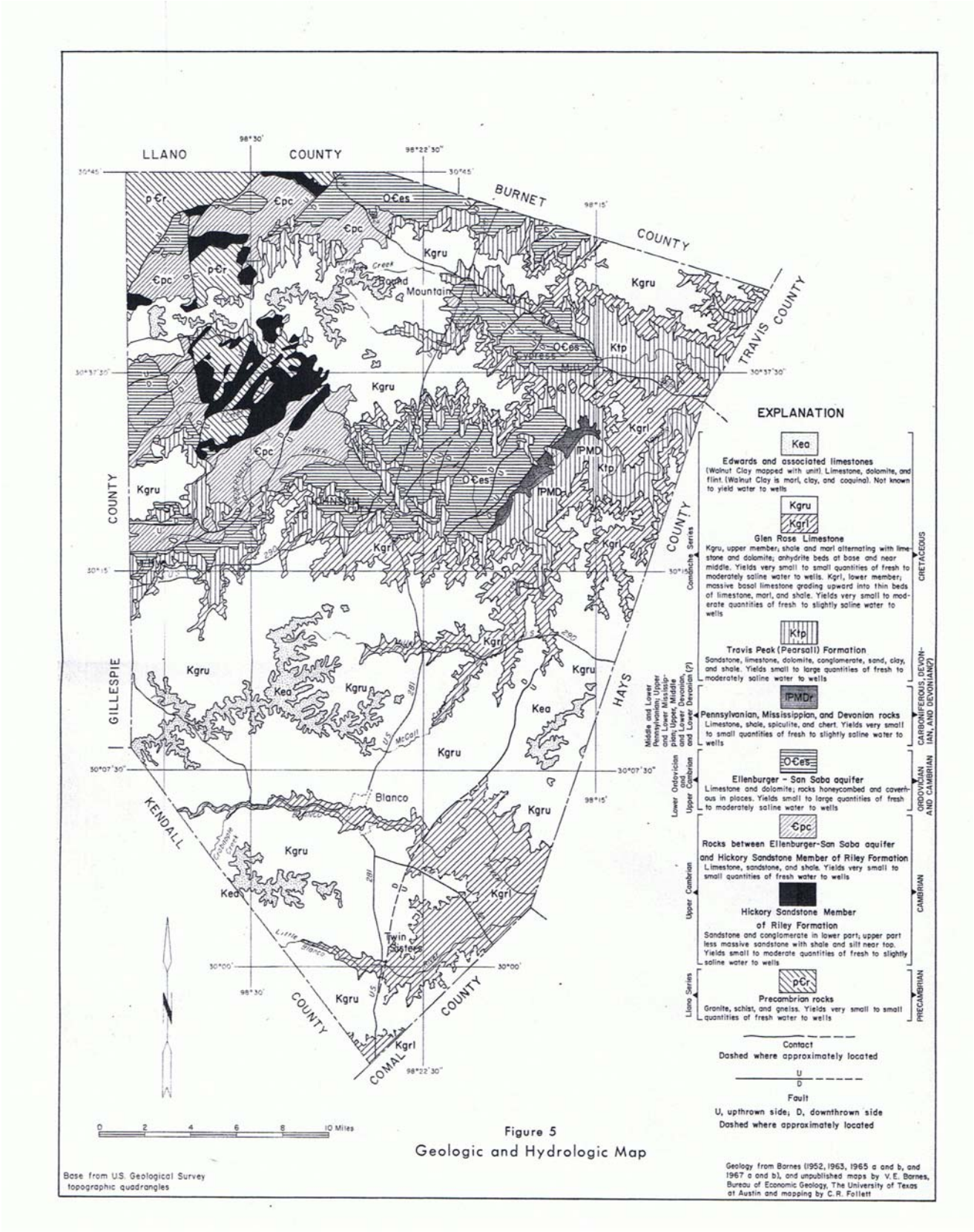


Figure 5
Geologic and Hydrologic Map

Geologic and Hydrologic Map of Blanco County, Texas

from

Texas Water Development Board Report 174, Groundwater Resources of Blanco County, Texas
C.R. Follett, USGS, August 1973

Table 2.—Geologic and Hydrologic Units and Their Water-Bearing Properties

SYSTEM	SERIES	GROUP	GEOLOGIC OR HYDROLOGIC UNIT	APPROXIMATE THICKNESS (FEET)	LITHOLOGY	WATER-BEARING PROPERTIES
Quaternary	Holocene and Pleistocene		Alluvium, fanglomerate, and high-level gravel	0 - 20?	Gravel, sand, silt, and clay.	Not known to yield water to wells in Blanco County. Alluvium probably would yield very small to small quantities of fresh water in some places along the Pedernales and Blanco Rivers.
Cretaceous	Comanche	Fredericksburg	Edwards and associated limestones	0 - 160	Hard massive limestone, nodular marly limestone, dolomite, and flint.	Not known to yield water to wells in Blanco County but may contribute some water to uncased holes tapping the Glen Rose Limestone. Yields water to springs near the base of the unit.
			Walnut Clay	0 - 13	Silty marl, clay, and basal coquina.	Not known to yield water to wells.
		Trinity	Glen Rose Limestone, Upper member	0 - 330?	Shale and marl alternating with thin beds of impure limestone and dolomite; impure anhydrite beds at base and near middle.	Yields very small to small quantities of fresh to moderately saline water to wells in much of the county.
			Glen Rose Limestone, Lower member	0 - 250?	Massive fossiliferous limestone in basal part grading upward into thin beds of limestone, marl and shale; *Salenia texana* and *Corbula texana* Whitney beds at top.	Yields very small to moderate quantities of fresh to slightly saline water to wells in much of the county.
			Travis Peak (Pearsall) Formation	0 - 285?	Sandstone, massive fossiliferous limestone, sandy limestone, dolomite, conglomerate, sand, clay, and shale.	Yields small to large quantities of fresh to moderately saline water to wells in much of the county.
	Coahuila	Nuevo León and Durango of Mexico	Sligo and Hosston Formations	0 - 210?	Shale, limestone, dolomite, sand, sandstone, and conglomerate.	Not known to yield water to wells in Blanco County.
Carboniferous, Devonian, and Devonian(?)	Middle and Lower Pennsylvanian; Upper and Lower Mississippian; Upper, Middle, and Lower Devonian, and Devonian (?)		Pennsylvanian, Mississippian, and Devonian rocks	0 - 800?	Massive limestone, in part cherty, shale, calcareous spiculite, lenticular biohermal limestone, crinoidal limestone, and chert.	Yields very small to small quantities of fresh to slightly saline water to a few wells near the Pedernales River south of Cypress Mills and at Cypress Mills.
Ordovician and Cambrian	Lower Ordovician and Upper Cambrian		Ellenburger - San Saba aquifer	0 - 2,310 +	Thinly to thickly bedded cherty limestone and dolomite; rocks honeycombed and cavernous in places.	Yields small to large quantities of fresh to moderately saline water to wells north of an east-west line about midway between Johnson City and Blanco.
Cambrian	Upper Cambrian		Rocks between Ellenburger - San Saba aquifer and Hickory Sandstone Member of Riley Formation	0 - 755 +	Thinly to thickly bedded limestone, in part biohermal, glauconitic, and shaley; glauconitic to nonglauconitic sandstone; and shale.	Yields very small to small quantities of fresh water to wells north of U.S. Highway 290 and west of U.S. Highway 281.
			Hickory Sandstone Member of Riley Formation	0 - 300 +	Mostly noncalcareous, nonglauconitic, crossbedded sandstone; lower part massive with conglomerate lenses near base; upper part less massive with considerable shale and silt near top.	Yields small to moderate quantities of fresh to slightly saline water to wells north of U.S. Highway 290 and west of U.S. Highway 281.
Precambrian	Llano		Precambrian rocks	–	Mostly medium to coarse-grained granite, amphibole and mica schist, and quartz diorite gneiss.	Yields very small to small quantities of fresh water to wells.

Geologic and Hydrologic Units in Blanco County, Texas

from

Texas Water Development Board Report 174, Groundwater Resources of Blanco County, Texas
C.R. Follett, USGS, August 1973

GENERAL DESCRIPTION OF THE DISTRICT

The Blanco-Pedernales Groundwater Conservation District includes all of Blanco County and covers roughly 715 square miles (457,825 acres). The BPGCD was created in accordance with the Chapter 36 petition process. On January 23, 2001, Blanco County voters approved the creation of the District, its maximum tax rate, and elected five Directors to govern the District. The District's authority and duties are derived primarily from Chapter 36 of the Texas Water Code, Vernon's Texas Civil Statues.

The Board of Directors (as of Fiscal Year 2008) is comprised of Bobby Wilson - Director of Precinct 3 and District Board President, Tom Murrah - Director of Precinct 1 and District Board Vice President, Jimmy Klepac - Director At Large and District Board Secretary, Neill Binford - Director of Precinct 4, and Phillip Sergeant - Director of Precinct 2.. The District General Manager is Ronald G. Fieseler, P.G.

District rules were originally adopted by the District Board in February 2002 and became effective on February 11, 2002. Current Rules were adopted on May 20, 2008.

Blanco County's economy is primarily agricultural based. The agricultural economy is derived from cattle, goats and sheep with significant contributions from the cultivation of flower nurseries, vegetables, hay crops, peaches, pecans, grapes and grains. Wildlife hunting also contributes to the area economy.

Tourists visiting local State and National Parks and other attractions contribute significant revenues to the local economy. In addition, over the past few decades, Blanco County and other Hill Country counties in close proximity to the cities of Austin or San Antonio have seen growth in population due to subdivision of large tracts of land into smaller acreages.

The two largest cities in the District are Johnson City and Blanco, which have a 2000 Census population of 1,191 and 1,505 people respectively. The small cities and communities (less than 300 people) of Round Mountain and Cypress Mill to the north of Johnson City, Hye to the west of Johnson City, and the Twin Sisters community south of Blanco are also in the District.

Although Blanco County lies within both the Colorado and Guadalupe River basins, for statewide water planning purposes it is part of the Lower Colorado Regional Water Planning Group (Region K).

Topography and Drainage

Blanco County has two primary watersheds: the Pedernales River, which is a tributary to the Colorado River, and the Blanco River, which is a tributary to the Guadalupe River. Surface drainage within the District is generally from west to east.

The District contains two major geologic features. The Llano Uplift extends into the northwestern portion of the District. This feature is made up of very old rocks ranging in age from 1.0 to 1.2 billion years and is comprised of granite and older metamorphic rocks. The other major feature is the Edwards Plateau. This is an elevated structure made up of Cretaceous age limestone, dolomite and marl. The Edwards Plateau extends west and covers many West Texas counties. Blanco County lies near the southeastern edge of the Plateau.

Elevation within the District ranges from a low of approximately 730 feet above sea level where the Pedernales River leaves Blanco County to approximately 1,901 feet above sea level north of the city of Blanco, on the divide between the Pedernales and Blanco River basins.

WATER RESOURCES WITHIN THE BLANCO-PEDERNALES GROUNDWATER CONSERVATION DISTRICT

Groundwater Resources and Usage in Blanco County

Within the BPGCD there are six aquifers which provide groundwater to county residents. Well depths vary from shallow, hand-dug wells 20-30 feet deep to drilled wells that vary between 30-1200 feet deep. Depths are highly variable even within the same aquifer and depend entirely on site-specific topography and geology. Water quality and water quantity also vary greatly throughout the District. Water quality within a specific aquifer can often be defined or characterized in a general sense, but can still be affected by local geology and hydrology. Six Blanco County aquifers are listed in Table 1 along with the current estimated groundwater availability or the Managed Available Groundwater (pending) for each aquifer based on information derived from the following sources:

- Volume I Chapter 3 of the Region K Water Supply Plan for the Lower Colorado Regional Water Planning Group (December 2006 Region K Plan)
- September 2000 TWDB report on "Groundwater Availability of the Trinity Aquifer, Hill Country Area, Texas: Numerical simulations through 2050" by Robert E. Mace, et. al.
- District estimates of available groundwater for the Upper Glen Rose (Upper Trintiy) aquifer.

The District will consider other new data as it becomes available and will amend this plan as appropriate.

Table 1

Projected Groundwater Availability Estimates by Aquifer and Decade
(acre-feet per year)

(source: December 2006 Region K Plan & TWDB Annual Water Use Survey Data, and BPGCD Estimates for Upper Trinity)

NAME OF SOURCE	BASIN	2008	2010	2020	2030	2040	2050	2060
Edwards-Trinity (Plateau)	Colo.	107	107	107	107	107	107	107
Edwards-Trinity (Plateau)	Guad.	50	50	50	50	50	50	50
Ellenberger-San Saba	Colo.	2,849	2,849	2,849	2,849	2,849	2,849	2,849
Ellenberger-San Saba	Guad.	1,025	1,025	1,025	1,025	1,025	1,025	1,025
Hickory	Colo.	747	747	747	747	747	747	747
Hickory	Guad.	165	165	165	165	165	165	165
Marble Falls	Colo.	300	300	300	300	300	300	300
Upper Trinity	Colo.	50	50	50	50	50	50	50
Upper Trinity	Guad	50	50	50	50	50	50	50
Middle Trinity	Colo.	1,099	1,099	1,099	1,099	1,099	892	892
Middle Trinity	Guad.	401	401	401	401	401	323	323
Total Projected Groundwater Availability Estimates		**6,843**	**6,843**	**6,843**	**6,843**	**6,843**	**6,560**	**6,560**

For District management and planning purposes, the Groundwater Availability Estimates listed in Table 1 will be utilized for planning purposes until the District receives from the TWDB the Managed Available Groundwater quantities resulting from the GMA 9 planning process.

Table 2

Estimated Annual Groundwater Pumpage for Blanco County (acre-feet per year)
(exclusive of the Edwards-Trinity, Upper Glen Rose, and Marble Falls aquifers)

(source: TWDB Annual Water Use Survey Data[1]; and BPGCD Estimated Updates for 2004-2008[2])

Aquifer	Year	Municipal	Mfg	Power	Mining	Irrigation	Livestock	**Yearly Totals**
Ellenburger - San Saba	1980[1]	183	0	0	0	102	227	**512**
Trinity	1980[1]	167	0	0	0	47	160	**374**
Ellenburger - San Saba	1984[1]	266	0	0	0	319	192	**777**
Trinity	1984[1]	187	0	0	0	38	135	**360**
Ellenburger - San Saba	1985[1]	337	0	0	0	226	200	**763**
Trinity	1985[1]	163	0	0	0	28	141	**332**
Ellenburger - San Saba	1986[1]	426	0	0	0	227	225	**878**
Trinity	1986[1]	168	0	0	0	28	159	**355**
Ellenburger - San Saba	1987[1]	450	0	0	0	227	224	**901**
Trinity	1987[1]	189	0	0	0	28	157	**374**
Ellenburger - San Saba	1988[1]	497	0	0	0	227	234	**958**
Trinity	1988[1]	196	0	0	0	28	166	**390**
Ellenburger - San Saba	1989[1]	511	0	0	0	412	238	**1,161**
Trinity	1989[1]	183	0	0	0	41	167	**391**
Ellenburger - San Saba	1990[1]	407	0	0	0	378	260	**1,045**
Trinity	1990[1]	236	0	0	0	47	183	**466**
Ellenburger - San Saba	1991[1]	405	0	0	0	378	265	**1,048**
Trinity	1991[1]	238	0	0	6	47	186	**477**
Ellenburger - San Saba	1992[1]	411	0	0	0	378	315	**1,104**
Trinity	1992[1]	238	0	0	6	47	221	**512**
Ellenburger - San Saba	1993[1]	419	0	0	0	374	307	**1,100**
Trinity	1993[1]	249	0	0	6	51	215	**521**
Ellenburger - San Saba	1994[1]	415	0	0	0	308	248	**971**
Other Un-differentiated (Hickory)	1994[1]	0	0	0	0	64	0	**64**
Trinity	1994[1]	290	0	0	6	51	173	**520**
Ellenburger - San Saba	1995[1]	497	0	0	0	329	275	**1,101**
Hickory	1995[1]	0	0	0	0	68	0	**68**
Trinity	1995[1]	305	0	0	6	54	192	**557**
Ellenburger - San Saba	1996[1]	527	0	0	0	327	225	**1,079**
Hickory	1996[1]	0	0	0	0	68	0	**68**
Trinity	1996[1]	286	0	0	6	54	157	**503**
Ellenburger - San Saba	1997[1]	512	0	0	0	327	233	**1,072**
Hickory	1997[1]	0	0	0	0	68	0	**68**
Trinity	1997[1]	298	0	0	6	54	162	**520**
Ellenburger - San Saba	1998[1]	536	0	0	0	327	221	**1,084**
Hickory	1998[1]	0	0	0	0	68	0	**68**
Trinity	1998[1]	313	0	0	6	54	153	**526**
Ellenburger - San Saba	1999[1]	568	0	0	0	327	219	**1,114**
Hickory	1999[1]	0	0	0	0	68	0	**68**
Trinity	1999[1]	330	0	0	6	54	152	**542**
Ellenburger - San Saba	2000[1]	573	0	0	0	23	209	**805**
Hickory	2000[1]	0	0	0	0	5	0	**5**
Trinity	2000[1]	333	0	0	6	4	145	**488**
Ellenburger - San Saba	2001[1]	615	0	0	0	50	218	**883**
Hickory	2001[1]	0	0	0	0	11	0	**11**
Trinity	2001[1]	381	0	0	6	7	151	**545**
Ellenburger - San Saba	2002[1]	550	0	0	0	50	239	**839**
Hickory	2002[1]	0	0	0	0	11	0	**11**
Trinity	2002[1]	262	0	0	6	7	167	**442**
Ellenburger - San Saba	2003[1]	594	0	0	0	39	156	**789**
Hickory	2003[1]	0	0	0	0	8	0	**8**
Trinity	2003[1]	161	0	0	6	5	108	**280**
Ellenburger - San Saba	2004[2]	580	0	0	0	53	209	**842**
Hickory	2004[2]	0	0	0	0	10	0	**10**
Trinity	2004[2]	290	0	0	6	51	173	**520**
Ellenburger - San Saba	2005[2]	580	0	0	0	53	209	**842**

Hickory	2005[2]	0	0	0	0	10	0	**10**
Trinity	2005[2]	305	0	0	6	54	192	**557**
Ellenburger - San Saba	2006[2]	580	0	0	0	53	209	**842**
Hickory	2006[2]	0	0	0	0	68	0	**68**
Trinity	2006[2]	400	0	0	6	54	175	**635**
Ellenburger - San Saba	2007[2]	580	0	0	0	53	209	**842**
Hickory	2007[2]	0	0	0	0	68	0	**68**
Trinity	2007[2]	330	0	0	6	54	125	**515**
Ellenburger - San Saba	2008[2]	580	0	0	0	53	209	**842**
Hickory	2008[2]	0	0	0	0	68	0	**68**
Trinity	2008[2]	420	0	0	6	54	175	**655**

As of May 2008, the District has not identified any wells producing significant groundwater quantities from the Edwards-Trinity (Plateau); the Upper Glen Rose (Upper Trinity), or the Marble Falls aquifers and has no current operating permits or pending applications for operating permits from those aquifers. Therefore, in order to provide for current and future demands from the few existing and anticipated domestic and livestock exempt wells that produce from these aquifers, and in order to help ensure continued flow from the seeps and springs that discharge from those aquifers and which subsequently provide base flow to local creeks and rivers, it shall be the policy of the District to deny any applications for drilling or permitting of any new non-exempt wells that propose to produce water from any of these aquifers. Therefore, the Managed Available Groundwater quantities for the Edwards-Trinity (Plateau); the Upper Glen Rose (Upper Trinity), or the Marble Falls aquifers shall be managed for either existing wells or new exempt wells.

Trinity Aquifer

The Trinity aquifer in Blanco County is comprised primarily of the Upper and Lower Glen Rose Limestone, Hensell Sand, and the Cow Creek Limestone. It extends across the majority of Blanco County, except in the northwestern corner of the county where Precambrian rock predominates. The Trinity aquifer receives some recharge from local precipitation on its outcrop and through the overlying units where it is in the subsurface. More localized and potentially higher rates of recharge for the Hensel Sand probably occur in Hensel Sand outcrops west of Blanco County. Yields vary greatly and are highly dependent on local subsurface physical characteristics. Yields from the Upper Glen Rose are usually small and at times intermittent. Yields from the Middle Trinity are generally low, usually between 10-50 gpm, but can occasionally be significantly higher, with yields of more than 500 gpm being reported from a few wells. Production from Trinity wells is primarily used for municipal, rural domestic and livestock demands. A small amount of irrigation occurs for flower nurseries, vegetables, hay crops, peaches, pecans, grapes and grains.

For groundwater management purposes, the District chooses to consider the Upper Glen Rose (Upper Trinity) as a separate aquifer and not integrate it with the Middle Trinity aquifer. No non-exempt wells producing from the Upper Glen Rose have been identified by the District as of May 2008.

Edwards-Trinity (Plateau) Aquifer

The Edwards-Trinity (Plateau) aquifer within Blanco County is scattered across the west central part of the county and is located at higher elevations along ridges. It is comprised of relatively thin layers of limestone and dolomite that is an extension of the Edwards Plateau into Blanco County from the west. Yields from the aquifer are low (<20 gpm) and the water, if used at all, is

used occasionally for rural domestic and livestock demands. The Edwards-Trinity aquifer in Blanco County exists in an unconfined condition. Recharge is solely from local precipitation occurring over the outcrop. Water not pumped from wells will generally discharge from small seeps and springs at the base of the Edwards outcrop and provides base flow to small streams within the county. No non-exempt wells producing from the Edwards-Trinity (Plateau) have been identified by the District as of May 2008.

Ellenburger Aquifer

The Ellenburger aquifer is a fractured limestone and dolomite and is present in the north central portions of the county. It lies generally west of Cypress Mill and north of US 290. From the outcrop areas, the aquifer dips predominately southeastward into the subsurface at angles up to 10 degrees in some areas. It is absent in a broad area extending from the central portion of the county continuing to the southern and eastern parts of Blanco County. Once again, well yields vary greatly depending on local conditions. Many Ellenburger wells have been pumped at rates between 3-45 gpm. In some areas though, significant localized development of subsurface solutional features has occurred within the Ellenburger resulting in it being able to produce quantities of groundwater greater than 200 gpm. The Ellenburger aquifer is utilized extensively by the City of Johnson City and many domestic and livestock users in that region of Blanco County. Recharge to the Ellenburger is mainly through outcrops and porous areas in the beds of rivers and tributaries, with some cross-formational flow contributions from overlying members of other aquifers.

Hickory Aquifer

The Hickory aquifer is comprised of sandstone and is found in northwestern Blanco County. Exposures are highly irregular in shape, due to both faulting and overlapping by rocks of Cretaceous age. This aquifer dips predominantly southeastward from the outcrop areas at angles of about 10 degrees in some areas. The Hickory yields low to moderate quantities of water. Well drillers have reported new wells producing up to 30 gpm. Recharge to the Hickory occurs from local precipitation on its outcrop and through the overlying units, where it is in the subsurface.

Marble Falls Aquifer

The Marble Falls aquifer is a limestone aquifer located in the general vicinity of Pedernales Falls State Park and Cypress Mill. It is reported to be highly fractured with extensive development of subsurface solutional features. In areas where the confining rock layers are thin or nonexistent, the Marble Falls aquifer may by hydrologically connected to the Ellenburger. This rather isolated and minor aquifer yields low to moderate quantities of water. Some wells in Blanco County have produced water with high nitrate concentrations. Due to its small surface extent, groundwater usage is limited to local domestic and livestock needs. No non-exempt wells producing from the Marble Falls have been identified by the District as of May 2008

Surface Water Resources and Usage in Blanco County

Within the District, all surface water impoundments consist of relatively small ponds and a few small dams on the Pedernales River, Blanco River, and their tributaries. The City of Blanco currently holds approximately 600 acre/feet of surface water rights from the Blanco River (January 2006 Region K Water Plan, Chapter 3, Table 3.10) and has a contract for 600 acre/feet of water from Canyon Lake Water Supply Corporation. The City of Blanco uses these surface water sources as the primary source of city municipal water. Johnson City maintains 220

acre/feet of surface water rights on the Pedernales River. However, this quantity is not being counted since Johnson City is currently relying on groundwater from a series of Ellenburger aquifer wells and is not withdrawing from the Pedernales River at this time. Local usage of surface water (usually for livestock watering or limited irrigation from small ponds or small scale diversions from surface streams) is termed "local supply" in the Region K Plan and totals approximately 248 acre-feet annually. Therefore, for planning purposes annual surface water availability in Blanco County totals approximately 1,448 acre-feet.

Projected Total Water Supply in Blanco County

As shown in Table 3, the projected total water supply in Blanco County currently stands at 5,287 acre-feet (4,565 acre-feet of groundwater and 722 acre-feet of surface water). Of this total water supply, an estimated 2008 demand of approximately 1800 acre-feet is supplied to water users through existing infrastructure (see Table 7). As future demands increase, changes in the infrastructure will be necessary. It is projected that the greatest demand on water resources will be from rural domestic users who will rely primarily on groundwater. The majority of infrastructure improvements necessary to service these new groundwater users will be provided by either local property owners or by small public water supply companies. Therefore, it is anticipated that the amount of water supplied at any given time will be primarily related to rural growth patterns.

Table 3

Projected Total Water Supply (in acre-feet) in Blanco County

(source: 2007 Texas State Water Plan)

Community	Basin	Source	2008	2010	2020	2030	2040	2050	2060
Blanco	Guad.	Blanco River **(Surface)**	596	596	596	596	596	596	596
Blanco	Guad.	Trinity Aquifer	25	25	25	25	25	25	25
Canyon Lake WSC	Guad.	Canyon Lake **(Surface)**	126	188	263	334	397	466	545
Johnson City	Colo.	Ellenburger-San Saba Aquifer	887	887	887	887	887	887	887
County-Other	Colo.	Other Local Supply **(Surface)**	37	43	49	55	57	56	56
County-Other	Colo.	Ellenburger-San Saba Aquifer	150	150	150	150	150	150	150
County-Other	Colo.	Hickory Aquifer	60	60	60	60	60	60	60
County-Other	Colo.	Trinity Aquifer	1,149	1,149	1,149	1,149	1,149	942	942
County-Other	Guad.	Edwards-Trinity Plateau Aquifer	50	50	50	50	50	50	50
County-Other	Guad.	Trinity Aquifer	85	0	0	0	0	0	0
Manufacturing	Guad.	Trinity Aquifer	9	9	9	9	9	7	7
Mining	Colo.	Ellenburger-San Saba Aquifer	285	285	285	285	285	285	285
Mining	Guad.	Trinity Aquifer	43	43	43	43	43	35	35
Irrigation	Colo.	Ellenburger-San Saba Aquifer	667	667	667	667	667	667	667
Irrigation	Guad.	Irrigation Local Supply **(Surface)**	9	9	9	9	9	9	9
Irrigation	Guad.	Trinity Aquifer	89	89	89	89	89	76	76
Livestock	Colo.	Livestock Local Supply **(Surface)**	101	101	101	101	101	101	101
Livestock	Colo.	Ellenburger-San Saba Aquifer	749	749	749	749	749	749	749
Livestock	Guad.	Livestock Local Supply **(Surface)**	101	101	101	101	101	101	101
Livestock	Guad.	Trinity Aquifer	69	69	69	69	69	56	56
Projected Water	**Supply**		**5,287**	**5,293**	**5,351**	**5,428**	**5,493**	**5,318**	**5,397**

Recharge of Groundwater in Blanco County

The annual natural recharge occurring in Blanco County is thought to be through percolation of rainfall countywide. More localized and potentially higher rates of recharge may be occurring in Hensel Sand outcrops west of Blanco County, and in the beds of rivers and tributaries. The District is currently unaware of any significant recharge feature in Blanco County that may be providing a major avenue for recharge.

The District is unaware of any scientific study on recharge rates or aquifer capabilities specific to Blanco County as a whole. However, a calculated annual recharge coefficient of approximately 4% of annual rainfall was developed in the September 2000 TWDB report on "Groundwater Availability of the Trinity Aquifer, Hill Country Area, Texas: Numerical simulations through 2050" by Robert E. Mace, et. al. Although the actual coefficients presented in Figure 25 of that report vary from 3% to 5%, and only cover the lower half of Blanco County, it seems reasonable for the District to assume a 4% average for Blanco County Trinity aquifer recharge, (Mace, et. al. have done this for the Trinity Aquifer as a whole). John Ashworth also developed a similar annual effective recharge coefficient (also 4% of average annual rainfall…about 30 inches) for the Trinity aquifer in the Texas Department of Water Resources Report 273, Ground-Water Availability of the Lower Cretaceous Formations in the Hill Country of South-Central Texas, January 1983. In Table 4, Mace, et al. has provided a flow budget for Blanco County based on the Hill Country Trinity aquifer model (in addition, see Table 5 for results of GAM Run 08-11).

Table 4

County flow budget from the Hill Country Trinity Aquifer Model (Mace and others, 2000) for the steady state model in 1975 for the Middle Trinity aquifer.

County	Recharge	Rivers	GHB	Lakes	Wells	X-flow in	X-flow out	Z-flow
Blanco	9,900	-13,400	0	0	-200	4,800	-9,200	8,200

Notes:

1. Units are in acre-ft/yr.
2. **GHB** refers to flow out of the Hill Country area to the south and east.
3. **X-flow in** refers to lateral flow into the county.
4. **X-flow out** refers to lateral flow out of the county.
5. **Z-flow** refers to flow into the Middle Trinity aquifer (downward cross-formational flow).
6. **Wells** is for 1975 pumping.
7. A negative sign refers to flow out of the county.
8. A positive sign refers to flow into the county.
9. Values greater than 100 acre-ft are rounded to the nearest 100 acre-ft and values less than 100 acre-ft are rounded to the nearest 10 acre-ft.
10. Because the table only represents the Middle Trinity aquifer, recharge may be zero or very small if the Middle Trinity sediments are not exposed at land surface.

Mace, R. E., Chowdury, A. H., Anaya, R., and Way, S.-C., 2000, Groundwater availability of the Middle Trinity aquifer, Hill Country area, Texas- Numerical simulations through 2050: Texas Water Development Board Final Report, 169 p.

The 2006 Region K Regional Water Plan provides estimated annual recharge for the Edwards-Trinity (Plateau), Ellenburger, Hickory, and Marble Falls aquifers. If we accept these recharge capabilities and include the recharge estimated for the Trinity aquifer by Mace, et. al., the resulting estimated annual recharge and flow for the six primary Blanco County aquifers is shown in Table 5. The District will review future and/or updated calculations resulting from the GMA 9 cooperative planning process. The District will consider this and other new data as it becomes available and will amend this plan as appropriate.

Table 5

Sources: Hill Country Trinity Aquifer Model (Mace & others, 2000); TWDB GAM Run 08-11[1]; 2007 Texas StateWater Plan[2]; and BPGCD Staff Estimates[3]

Blanco County Aquifers	Estimated Annual Recharge from Precipitation	Estimated Discharge to Springs, & Surface Water Bodies	Estimated Annual Flow into District	Estimated Annual Flow out of District
Upper Trinity	22,069 acre-feet[1]	-14,371 acre-feet[1]	3,505 acre-feet[1]	-1,995 acre-feet[1]
Middle Trinity	10,411 acre-feet[1]	-12,463 acre-feet[1]	4,214 acre-feet[1]	-8,490 acre-feet[1]
Edwards (Plateau)	0 acre-feet[1]	0 acre-feet[1]	0 acre-feet[1]	0 acre-feet[1]
Ellenburger	2,136 acre-feet[2]	1,000 acre-feet[3]	1,000 acre-feet[3]	0 acre-feet[3]
Hickory	6,528 acre-feet[2]	1,500 acre-feet[3]	1,500 acre-feet[3]	0 acre-feet[3]
Marble Falls	300 acre-feet[2]	150 acre-feet[3]	0 acre-feet[3]	0 acre-feet[3]

Estimated flow between Edwards (Plateau) into Trinity: 0 acre-feet[1]
Estimated flow between Upper Trinity into Middle Trinity: -8,271 acre-feet[1]
Estimated flow between Ellenberger into Hickory: 0 acre-feet[3]
Estimated flow between Ellenberger into Marble Falls: 0 acre-feet[3]
Estimated flow between Hickory into Marble Falls: 0 acre-feet[3]

These numbers clearly need further study and refinement to more accurately correlate estimated recharge with estimated groundwater availability. The estimated annual recharge for the Ellenberger is less than, and the estimated annual recharge for the Hickory far exceeds, the available water shown in Tables 1 and 3. The calculated recharge potential for the Trinity aquifer and the Hickory may be deceptively high when viewed in terms of groundwater actually available for well production.

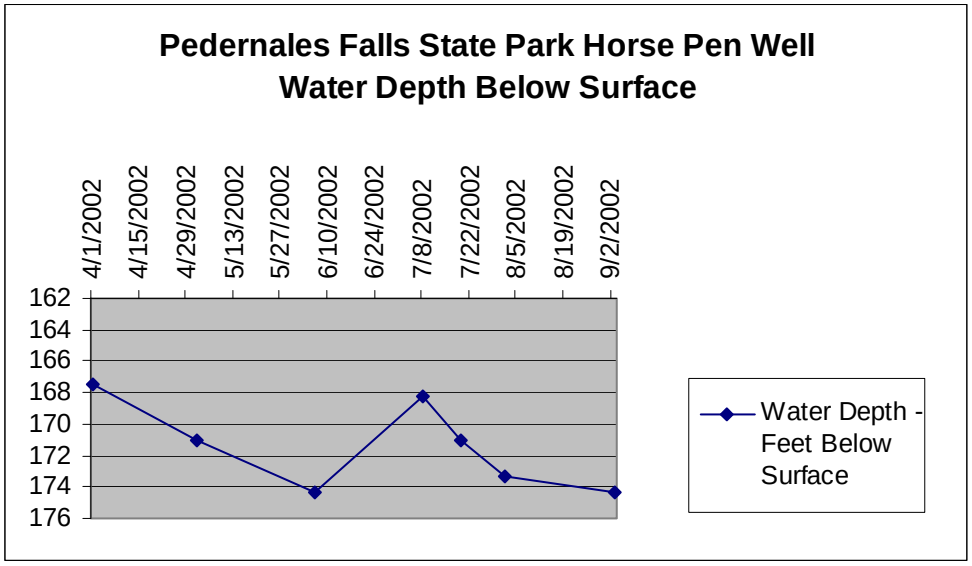
These recharge potentials are not to be confused with “recoverable” groundwater. Not all groundwater is recoverable. Some is discharged to spring flow and seeps, some is used by plant life while the water is still near the surface, while some is almost permanently retained within the rock itself. For instance, much of the Trinity is a rather “tight” formation, particularly in the vertical direction. The Trinity is known for its low porosity and permeability, limited fracturing and faulting, and a complicated stratigraphy that includes layers of rock that reduce transmissivity and retard downward-moving recharge water. As a result, individual well yields are often quite low and, though large quantities of water may be present in the subsurface, much of the groundwater may be unrecoverable due to these hydrogeologic conditions.

As previously mentioned, considerable amounts of water recharging the Trinity aquifer will be utilized by natural processes, some through biologic uptake and a significant amount through discharge at springs and seeps that provide relatively reliable base flow to local rivers and tributaries. Thus, much of the annual recharge may enter the ground, only to quickly leave it again as base flow to surface streams (see Table 5). This is water that the aquifer rejects on an average annual basis and is potentially available and can theoretically be retrieved (at least on a

short-term basis) without diminishing the average volume of groundwater being recharged to storage or, in other words, without creating a mining situation within the aquifer. However, if extensive pumping of this available water occurs, then base flow to area springs, streams, creeks, and rivers will be greatly reduced, and the effects of this reduction may be undesirable with regards to environmental needs. Extensive pumping will also reduce the pressure head and may result in a significantly smaller quantity of recharge water actually percolating downward through the complex geology before providing deeper aquifer recharge that would be available for more reliable, long-term well production. Once pumping exceeds average annual recharge, then an aquifer mining condition will exist and groundwater availability will decline. Until further studies can provide more accurate estimates of average annual recharge, management strategies for the Middle Trinity Aquifer should rely on the 1,500 acre-feet of Middle Trinity groundwater estimated as available for production by the Region K plan.

Table 6 illustrates how heavy rainfall during July 2002 resulted in significant recharge and a rapid rise in water levels in local wells, only to return to previous levels over a two month period as groundwater was discharged, most likely through springs and seeps.

Table 6



Recharge Enhancement Potential

The District has yet to assess potential recharge projects in Blanco County. The District General Manager will solicit ideas and information and will investigate any potential recharge enhancement opportunity, natural or artificial, that is brought to the District's attention. Such projects may include, but are not limited to: cleanup or site protection projects at any identified significant recharge feature, encouragement of prudent brush control practices, non-point source pollution mitigation projects, aquifer storage and recovery projects, development of recharge ponds or small reservoirs, and the encouragement of appropriate and practical erosion and sedimentation control at construction projects located near surface streams.

Projected Population and Water Demands in Blanco County

Population and water demand projections are given for Blanco County in Volume I, Chapter 2 of the Region K Plan(and subsequently in the 2007 Texas State Water Plan). The following table provides Blanco County populations and water demand projections for every ten years beginning in 2000 and ending with 2060.

Table 7

Blanco County Population Projections and Water Demands
(Volume I, Appendix 2A, Region K Regional Water Plan, January 2006)

Blanco County Population Projections	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**
Blanco	1,238	1,505	1,672	1,870	2,059	2,224	2,403	2,611
Johnson City	932	1,191	1,353	1,545	1,728	1,888	2,062	2,264
County Other	3,802	5,722	6,921	8,341	9,700	10,890	12,176	13,669
Total	**5,972**	**8,418**	**9,946**	**11,756**	**13,487**	**15,002**	**16,641**	**18,544**

Blanco County Water Demands (in acre-feet)	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**
Municipal/Rural)	n/a	1,205	1,421	1,678	1,922	2,138	2,369	2,639
Irrigation	n/a	73	69	66	62	58	56	55
Manufacturing	2	2	2	2	2	2	2	2
Mining	n/a	6	5	5	5	5	5	5
Livestock	n/a	443	443	443	443	443	443	443
Total Water Demand	n/a	**1,729**	**1,940**	**2,194**	**2,434**	**2,646**	**2,875**	**3,144**

Projected Water Needs and Water Management Strategies in Blanco County

Projected water needs and water management strategies are given for Blanco County in Volume II, Chapter 4 of the Region K Regional Water Plan, January 2006 (and subsequently in the 2007 Texas State Water Plan). Tables 8 and 9 provide Blanco County propjected water needs and water management strategies for every ten years beginning in 2000 and ending with 2060.

Table 8

Blanco County Water Supply Needs
(in acre-feet)
(Volume II, Table 4.2, Region K Regional Water Plan, January 2006)

Blanco County Water User Group	**2000 Needs**	**2010 Needs**	**2020 Needs**	**2030 Needs**	**2040 Needs**	**2050 Needs**	**2060 Needs**
County-Other	(44)	(122)	(169)	(192)	(210)	(233)	(263)
Manufacturing	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Total	**(45)**	**(123)**	**(170)**	**(193)**	**(211)**	**(234)**	**(264)**

Table 9

Blanco County Water Management Strategies
(in acre-feet)
(Volume II, Appendix 4A, Region K Regional Water Plan, January 2006)

Blanco Co. Water User Group	River Basin	WMS Name	Source Name		2000 Needs	2010 Needs	2020 Needs	2030 Needs	2040 Needs	2050 Needs	2060 Needs
Blanco	Guad.	Purchase Water from Canyon Lake WSC	Canyon Lake	Shortage/Surplus	341	318	290	261	240	212	176
				Strategy	0	0	600	600	600	600	600
				New Shortage/Surplus	341	318	890	861	840	812	776
County-Other	Guad.	Purchase Water from Canyon Lake WSC (Reg. L Strategy	Canyon Lake	Shortage/Surplus	(44)	(122)	(169)	(192)	(210)	(233)	(263)
				Strategy	225	225	225	225	225	233	263
				New Shortage/Surplus	181	103	56	33	15	0	0
County-Other	Colo.	Water allocated to Manufacturing (Blanco Co. Colo. Basin)	Trinity	Shortage/Surplus	8	8	8	8	8	8	8
				Strategy	(1)	(1)	(1)	(1)	(1)	(1)	(1)
				New Shortage/Surplus	7	7	7	7	7	7	7
Manufacturing	Colo.	Allocate water from County-Other (Blanco Co. Colo. Basin)	Trinity	Shortage/Surplus	(1)	(1)	(1)	(1)	(1)	(1)	(1)
				Strategy	1	1	1	1	1	1	1
				New Shortage/Surplus	0	0	0	0	0	0	0

Summary of Blanco County Water Resources 2000-2060

Between 2000 and 2060, total countywide water demand is estimated to increase approximately 67.8%, from 1,729 acre-feet to 2,901 acre-feet. The estimated amount of managed available groundwater within the county in 2060 is approximately 6,560 acre-feet per year. As a result, it would appear that there will be a surplus of 3,659 acre-feet per year in the year 2060 and no shortfall should occur. This will probably be the case for some of the county's aquifers and areas. However, there will probably be areas of the county where demand will be such that some of the aquifers with low production capability will be in a stressed condition and may not be able to meet higher demand.

Much of the growth now occurring in Blanco County is focused on the southern end of the county. This area is served primarily by private water wells producing from the Middle Trinity Aquifer. This aquifer is well known for locally variable well yields…10-50 gpm seems to be the average, but some high volume wells are capable of producing 100-500 gpm. The Middle Trinity Aquifer is also known for some water quality concerns involving hardness and odors. It is conceivable that with continued growth, this particular aquifer could be overextended during the next 52 years to the point where quantity and quality problems may increase.

The Ellenburger Aquifer as a whole should be able to meet future demands placed on it through the year 2060. However the District believes that the areas adjacent to Johnson City may experience seasonal shortfalls from the Ellenburger if development of small acreage lots increases. Many of these developments will be solely dependent upon the Ellenburger since the underlying Precambrian rocks are essentially void of groundwater. Consequently, the Ellenburger adjacent to Johnson City will need to be carefully monitored in order to determine how long it will be able to meet future demands of local users.

The Edwards-Trinity (Plateau), Hickory, and Marble Falls aquifers are located in areas that are not expected to undergo extensive development and are not likely to experience water quantity or quality problems during the 50 year planning horizon.

ACTION, PROCEDURES, PERFORMANCE AND AVOIDANCE FOR PLAN IMPLEMENTATION

The District will manage the supply of groundwater within the District based on Desired Future Conditions and Managed Available Groundwater resulting from the Groundwater Management Area 9 cooperative planning process, exempt and non-exempt wells and groundwater demands, and the District's best available data.

The District has adopted Rules and shall promulgate additional Rules as necessary that will require the permitting of wells and groundwater production limits for non-exempt wells within the District consistent with the provisions of Chapter 36.113 and other pertinent sections of Chapter 36.

The District is in agreement with the position of Region K stated in Region K Plan (ES.9.4) to support management of groundwater resources at the sustainable level wherever possible. Therefore, it shall be the policy of the District to limit withdrawal of groundwater from wells producing from Blanco County aquifers to no more than the current groundwater availability volumes indicated for the individual aquifers in the Region K Plan (January 2006) and subsequently the Managed Available Groundwater numbers resulting from the GMA 9 planning process once those are available. Groundwater availability estimated volumes are listed in Table 1 of this Groundwater Management Plan.

There is limited groundwater contained within the Edwards-Trinity (Plateau), the Upper Glen Rose (Upper Trinity), and the Marble Falls aquifers, all of which are known for low productivity and/or intermittent availability. Groundwater from the Edwards-Trinity (Plateau) and the Upper Glen Rose (Upper Trinity) aquifers often discharges from springs and seeps which provide base flow to local creeks and rivers. In order to help protect these limited aquifers and to help extend the period of spring and seep flow during times of drought or limited rainfall, it shall be the policy of the District to deny any applications for drilling or permitting of any new non-exempt wells that propose to produce water from any of these aquifers. Furthermore, it shall be the policy of the District to require that wells be completed in such a manner as to prevent groundwater leakage from these aquifers into any underlying aquifer.

The District has adopted Rules and shall promulgate additional Rules as necessary that will regulate the spacing of wells and the production of groundwater consistent with the provisions Chapter 36.116. The District wishes to emphasize that in regulating or limiting groundwater production, it shall be the policy of the District to preserve historic use prior to February 11, 2002 (the effective date of the District's Rules) to the greatest extent practical and consistent with this plan.

In order to help prevent waste of groundwater, it shall be a policy of the District to discourage and/or restrict the pumping of groundwater into ponds, lakes, tanks, reservoirs, swimming pools, or other surface impoundments for holding water. The District has adopted Rules and shall promulgate additional Rules as necessary to implement this policy.

The District will implement and utilize the provisions of this groundwater management plan for all District activities. The District's current and future Rules will be promulgated pursuant to the provisions of Texas Water Code Chapter 36 and shall address, implement, and be consistent with the provisions and policies of this plan.

The District shall review and re-adopt this plan, with or without revisions, at least once every five years in accordance with Chapter 36.1072(e).

Any amendment to this plan shall be in accordance with Chapter 36.1073.

The District will seek cooperation and coordination in the development and implementation of this plan with the appropriate state, regional or local water management or planning entities.

The District will monitor groundwater conditions through its water level and water quality monitoring programs that are currently in place and will continue to maintain and update the District's database, which was established in 2002.

If necessary, the District may, through the rule-making process, identify areas within the District which, based on results from District aquifer monitoring, are identified as Critical Groundwater Depletion Areas. These areas, when identified by the District in accordance with District Rules, may require specific pumping limits or reduction measures to ensure that groundwater supply is maintained and protected.

The District will encourage cooperative and voluntary Rule compliance, but if Rule enforcement becomes necessary, the enforcement will be legal, fair, and impartial.

Current District Rules are available for viewing or downloading at the District website:

www.blancocountygroundwater.org

METHODOLOGY FOR TRACKING PROGRESS IN ACHIEVING MANAGEMENT GOALS

The District will use the following methodology to track its progress toward achieving its management goals:

The District General Manager will present an annual report to the Board of Directors on District performance and progress in achieving management goals and objectives at the first regular District Board meeting of the following calendar year beginning in Fiscal Year 2003.

GROUNDWATER MANAGEMENT GOALS

1.0 Implement management strategies that will provide for the most efficient use of groundwater.

1.1 Management Objective

Implement and maintain a program of issuing well operating permits for non-exempt wells within Blanco County.

Performance Standards

Annual issuance or re-issuance of one or more well operating permits each year.

1.2 Management Objective

The District will evaluate the effectiveness of current well spacing requirements in District Rules to help reduce or prevent interference between nearby wells. Spacing requirements will be coordinated to the greatest extent possible with Blanco County subdivision regulations and the Water Well Drillers Rules (16 Texas Administrative Code Chapter 76).

Performance Standards

Annual report submitted to the District Board regarding suitability of current District well spacing rules and their compatibility with Blanco County subdivision regulations and the Water Well Drillers Rules.

2.0 Implement strategies that will control and prevent waste of groundwater.

2.1 Management Objective

Each year the District will provide to local newspapers at least one article describing a 5-7 day summer watering schedule and water efficient practices available for implementation by groundwater users during summer months.

Performance Standards

Number of summer watering articles submitted to local newspapers each year.

2.2 Management Objective

Provide to the public, upon request, water efficient literature handouts.

Performance Standards

Each year provide water efficient literature handouts on at least one occasion.

2.3 Management Objective

Provide either a speaker at a local club or organization or a display booth at public events twice each year.

Performance Standards

Number of speaking engagements or booth displays each year.

2.4 Management Objective

The Edwards-Trinity (Plateau), the Upper Glen Rose (Upper Trinity), and the Marble Falls aquifers are known for low productivity and intermittent availability. The District intends to help extend the availability of groundwater during times of drought or limited rainfall by evaluating the effectiveness of current Rules to discourage utilization of those aquifers and prevent leakage from those aquifers into other aquifers.

Performance Standard

Annual report submitted to the District Board regarding suitability of current District Rules prohibiting the drilling of new non-exempt wells in these aquifers and requiring that wells be completed in such a manner as to prevent groundwater leakage from these aquifers into any underlying aquifers.

3.0 Implement strategies that will control and prevent subsidence.

The rigid geologic framework of the region precludes significant subsidence from occurring. Therefore, this goal is not applicable to the operations of this District.

4.0 Implement management strategies that will address conjunctive surface water management issues.

4.1 Management Objective

Assist Blanco County Commissioners Court in the evaluation of water availability reports submitted in accordance with County subdivision requirements.

Performance Standard

Annual report submitted to District Board evaluating the status of the MOU and a brief report on any water availability reports reviewed in accordance with the MOU.

4.2 Management Objective

Determine if studies may be warranted regarding possible need to develop correlations between spring flow, surface stream elevations/flows, rainfall, and groundwater levels.

Performance Standard

Annual report submitted to District Board on the evaluation of any such studies and a brief report on any study deemed to be warranted.

5.0 Implement strategies that will address natural resource issues which impact the use and availability of groundwater, or which are impacted by the use of groundwater.

5.1 Management Objective

Springs and seeps flowing from outcrop areas of the Edwards-Trinity (Plateau) and the Upper Glen Rose (Upper Trinity) aquifers provide water to local habitat

and often provide base flow to nearby creeks and rivers. Both aquifers are known for low productivity and intermittent availability. The District intends to help extend the period of spring and seep flow during times of drought or limited rainfall by evaluating the effectiveness of current Rules to discourage utilization of those aquifers and prevent leakage from those aquifers into other aquifers.

Performance Standard

Annual report submitted to the District Board will include a summary regarding suitability of current District Rules prohibiting the drilling of new non-exempt wells in those aquifers; and, for those wells that penetrate those aquifers to produce groundwater from lower aquifers, current Rules requiring the sealing off of those aquifers during the cementing/grouting process.

6.0 Implement strategies that will address drought conditions.

6.1 Management Objective

Quarterly, review applicable data to determine status of drought condition and, if necessary, report to District Board on need to implement drought contingency plan.

Performance Standards

Annual report submitted to District Board on drought conditions in preceding year.

6.2 Management Objective

Provide to the public, upon request, drought-orientated literature handouts.

Performance Standards

Each year provide drought-orientated literature handouts on at least one occasion.

6.3 Management Objective

To evaluate groundwater availability each year the District will monitor water levels on selected wells representative of the two primary aquifers within the District in accordance with the water level monitoring schedule in Table 8.

Table 10

Water Level Monitoring Schedule

Aquifer	# of Wells	Minimum Frequencies
Trinity	3	4 times per year
Ellenburger	2	3 times per year

Performance Standard

Number of water level records measured annually.

7.0 Implement strategies that will address groundwater conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, or brush control where appropriate and effective.

7.1 Groundwater Conservation

7.1.A Management Objective

Each year the District will provide to local newspapers at least one article identifying the importance of water conservation and various water conservation methods available for implementation by groundwater users.

Performance Standards

Each year provide a water conservation oriented article to local newspapers on at least one occasion.

7.1.B Management Objective

Provide to the public, upon request, conservation literature handouts.

Performance Standards

Each year provide conservation literature handouts on at least one occasion.

7.2 Recharge Enhancement

7.2.A Management Objective

Investigate potential opportunities for recharge enhancement projects, either natural or artificial.

Performance Standard

Annual report submitted to the District Board on investigation of the number of potential recharge enhancement opportunities, if any.

7.3 Rainwater Harvesting

7.3.A Management Objective

The District will promote rainwater harvesting and provide advice, information, and literature regarding the benefits of rainwater harvesting.

Performance Standards

Each year provide rainwater harvesting literature handouts on at least one public occasion and to individuals upon request. The number of occasions that rainwater harvesting handouts were distributed will be included in the annual report to the District Board.

7.4 Precipitation Enhancement

This strategy is too costly for consideration by the District at this time. Therefore, this goal is not applicable to the operations of this District at this time.

7.5 Brush Control

This strategy is being implemented in Blanco County by the Pedernales Soil and Water Conservation District and other agencies. Therefore, this goal is not applicable to the operations of this District at this time.

8.0 Address the Desired Future Conditions of the groundwater resources in a quantitative manner.

8.1 Management Objective

For any aquifer that has an approved DFC and a TWDB generated MAG quantity, assess whether the current District programs and actions toward meeting the DFC and MAG quantity are sufficient or require further attention.

Performance Standards

A. For any aquifer with an approved DFC (other than those with a DFC of no net increase in drawdown), measure water levels in one or more District-designated monitor wells one or more times annually and compare with the average drawdown and the allowable drawdown resulting from the DFC and MAG process. This comparison will be will be included in the annual report to the District Board and will also be reviewed by the District at least once every five years and provided to the GMA 9 Committee as part of the GMA 9 review process required under Texas Water Code Section 36.108.

B. For any aquifer with an approved DFC of no net increase in drawdown (which therefore has a MAG quantity of 0) and with District Rules prohibiting the issuance of new well operating permits for that aquifer, the number of new well operating permits issued during the preceding year for such aquifers will be included in the annual report to the District Board. This information will also be reviewed by the District at least once every five years and provided to the GMA 9 Committee as part of the GMA 9 review process required under Texas Water Code Section 36.108.

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Blanco-Pedernales Groundwater Conservation District

601 West Main, P.O. Box 1516, Johnson City, Texas 78636 (830) 868-9196 FAX (830) 868-0376

www.blancocountygroundwater.org

manager@blancocountygroundwater.org